

ASSOCIATION FOR  
**LEARNING  
ENVIRONMENTS**

**CHICAGO**

**LearningSCAPES 2023**

# Resilient Buildings Create Resilient Students:

## Combining wellness and net zero design





John Mlade, LFA, WELL Faculty, LEED Fellow  
Director of Sustainable & Healthy Environments  
Wight & Company



Wes Del Prete, LEED AP BD+C  
Architecture – Senior Project Designer  
Wight & Company



Habib Osman  
Director of Facilities and Food Services.  
Adlai E. Stevenson High School  
Sodexo School Services



## Learning objectives

- Participants will learn about the successful planning and implementation of the WELL Building Standard and Zero Energy Certification on a high school campus. Specific strategies that make the campus more resilient will be discussed.
- The role of master planning and visioning will be discussed for attendees to understand their underlying importance.
- Participants will understand how both the physical infrastructure as well as policy and programming influence the wellbeing of students and staff.
- Participants will learn how programming decisions around facilities and food service can improve student outcomes and may be achieved without major capital cost implications.



# **This is a conversation**

About energy.

About carbon.

About student wellness.

About engagement.

# Adlai E. Stevenson High School

Nationally recognized high-performing high school, whose mission *Success for Every Student* guides decision-making in all aspects of the teaching and learning experience

**First year of operation:** 1965

**Size of school:** ±1,056,000 square feet

**Number of students:** +4,500

**Number of faculty & staff:** 550

**Average SAT score:** 1263

**Average ACT score:** 27

**Advanced Placement participation:** 2,100 students took an AP exam in 2022

**Percent of grads who attend college:** 96%

**Ranked the #1 Public School in IL by *U.S. News and World Report***

**Ranked the #1 School District in America by Niche.com**

**National Blue Ribbon School Awards: 5**



# Success for Every Student

Over its history, Adlai E. Stevenson High School in Lincolnshire, IL has demonstrated and sustained a track record of prioritizing practices and initiatives that optimize the teaching and learning experience.

The school embodies a culture of continuous improvement that extends to “whole student” wellness. Sustainability is codified in operational policy. Additionally, design choices for the buildings — specifically for the East Building additions — are made with student’s social emotional learning needs in mind:

- Easy access to Student Services
- Open and airy spaces with green and natural colors
- Access to a state-of-the-art Patriot Wellness Center
- A living wall
- Healthy food and drink options and more



# Success for Every Student

In addition to its practical purposes for physical wellness, the building's biophilic design is intended to boost students' mental and cognitive well-being by bringing the feeling of nature indoors.

Research has shown that biophilic design is correlated with decreased stress and anxiety as well as increased cognition, attention and memory.

The district demonstrates its commitment to healthy learning spaces through campus certifications for high performance design, including International Living Future Institute's Zero Energy Certification and the WELL Building Standard (in addition to LEED).





# A Demonstrated Commitment to Verified Environmental Leadership



LEED EBOM 2009 Gold – June 2011  
Recert EBOM 2009 Gold – July 2016  
Recert V4 EBOM Gold (ARC) – Aug 2022



**East Building Addition Phase I**  
LEED Platinum; LAPT Platinum; Zero Energy Certified (ILFI)



**Fitness Center**  
LEED Gold and targeting WELL Platinum

**Fieldhouse**  
LEED Gold; targeting WELL Platinum; targeting LEED Zero

# ARC – A streamlined approach to measuring & reporting on your campus-wide sustainability efforts for LEED re-certification

## Transportation

The survey asks one simple question: “On a typical day, how do you get to the building—one day, one way?” Respondents—which must comprise at least 25% of occupants—must include mileage for each transportation mode used.

## Waste

The platform allows you to use either 12 months of data (as provided by your waste haulers) or data from a waste audit.

## Water

Measure total potable water use on a monthly basis for twelve consecutive months (one full year). Input the twelve months of potable water use data into the Arc Platform and calculate a Water Performance Score for the project.

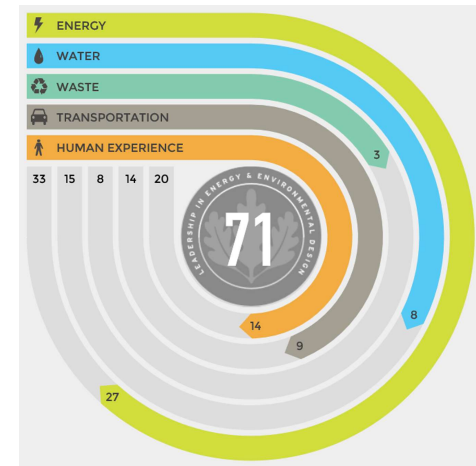
## Energy

Arc energy score is based on a combination of greenhouse gas emissions and source energy. Both factors are equally weighted in the Arc Energy Score, which contributes up to 33 of the 100 total points in Arc. Used to be based on EnergyStar - now compares your building to other green buildings.

## Human Experience

Human Experience is based on three data points:

- Annual occupant satisfaction survey
- Annual indoor air quality evaluation:
  - Carbon dioxide levels – less than 1000 ppm
  - TVOCs – less than 500 ppm



# Policy & Code Trends

**Model Stretch Code Provisions**  
for a 20% Performance Improvement  
in New Commercial Construction

Correlated to **ASHRAE 90.1-2013**  
and **IECC 2015**

Developed in Support of  
the **Zero Cities Project**

nbi new buildings  
institute

nbi new buildings  
institute

**The Building  
Electrification  
Technology  
Roadmap (BETR)**

**A BETR Path to Decarbonization  
for California Efficiency Programs**  
Technical status, barriers, and paths  
to advancing electrification technologies  
in residential and commercial buildings.

Prepared By:  
Alexi Miller and Cathy Higgins  
New Buildings Institute

January 2021

In Partnership with  
**BUILDING  
DECARBONIZATION  
COALITION**

With Sponsorship From:  
EPRI | SDP | Pacific Gas and Electric Company | EDISON | SMUD

**Moving Energy  
Codes Forward:  
A Guide for Cities  
and States**

nbi new buildings  
institute

**Climate-Friendly  
Buildings**

A New Construction Guide  
to Support Santa Monica's  
Energy Reach Code

UNIVERSITY OF CALIFORNIA  
SANTA MONICA

# Plan for the Future & Embrace Evolution



ADLAI STEVENSON HIGH SCHOOL DISTRICT 125  
**2021 Master Planning Update Report**

# Towards a Carbon Neutral Campus

- Building efficiency and maintenance
- Photovoltaic array
- Building electrification
- Electric vehicle infrastructure – planning for continued growth of EVs

Over **30 cities in California** have adopted some form of electrification codes, but a number of other cities in states across the country have also moved forward since last fall on policies favoring electrification. **Brookline (MA), Bellingham (WA), Park City (UT), Takoma Park (MD), and Ann Arbor (MI)** are among a growing list of cities considering or proposing measures that would prevent natural gas supply to new projects and incentivize electrification of existing buildings.

Country	Current government proposals to ban ICE only vehicle sales
 China	Actively considering and studying a ban
 France	2040
 Germany	2030
 India	2030
 Ireland	2030
 Israel	2030
 Netherlands	2030
 Norway	2025
 Scotland	2032
 UK	2040

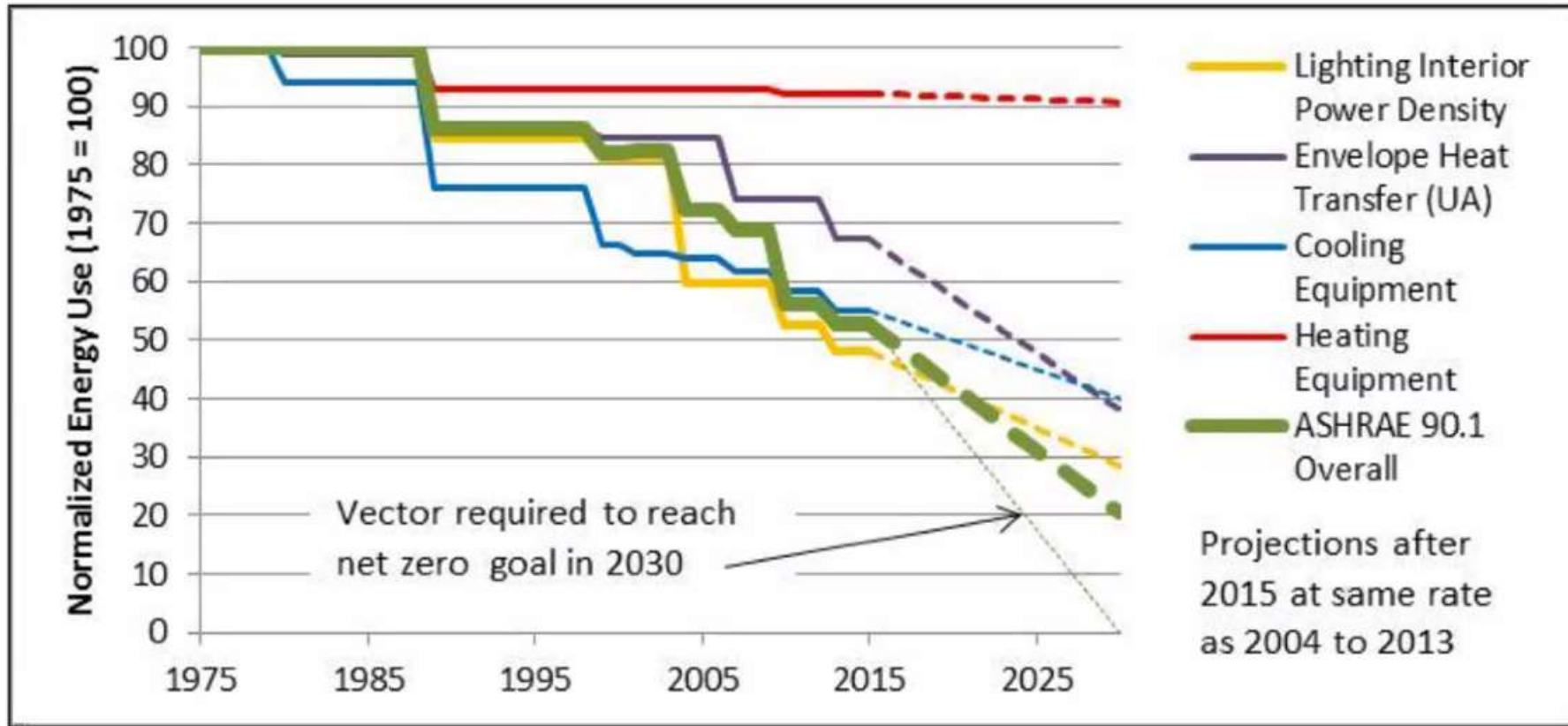
The Sun will Set on the Internal Combustion Engine

## Campus Energy Systems

- Energy saving strategies, from planned maintenance, equipment upgrades, and new construction reduce campus EUI
- A 1.34 MW photovoltaic system is installed on campus buildings, generating 1.715 MWh of electricity annually
- A natural gas peaker plant enables the campus to completely disconnect from the local electrical grid as part of a demand response program while maintaining full operations of buildings

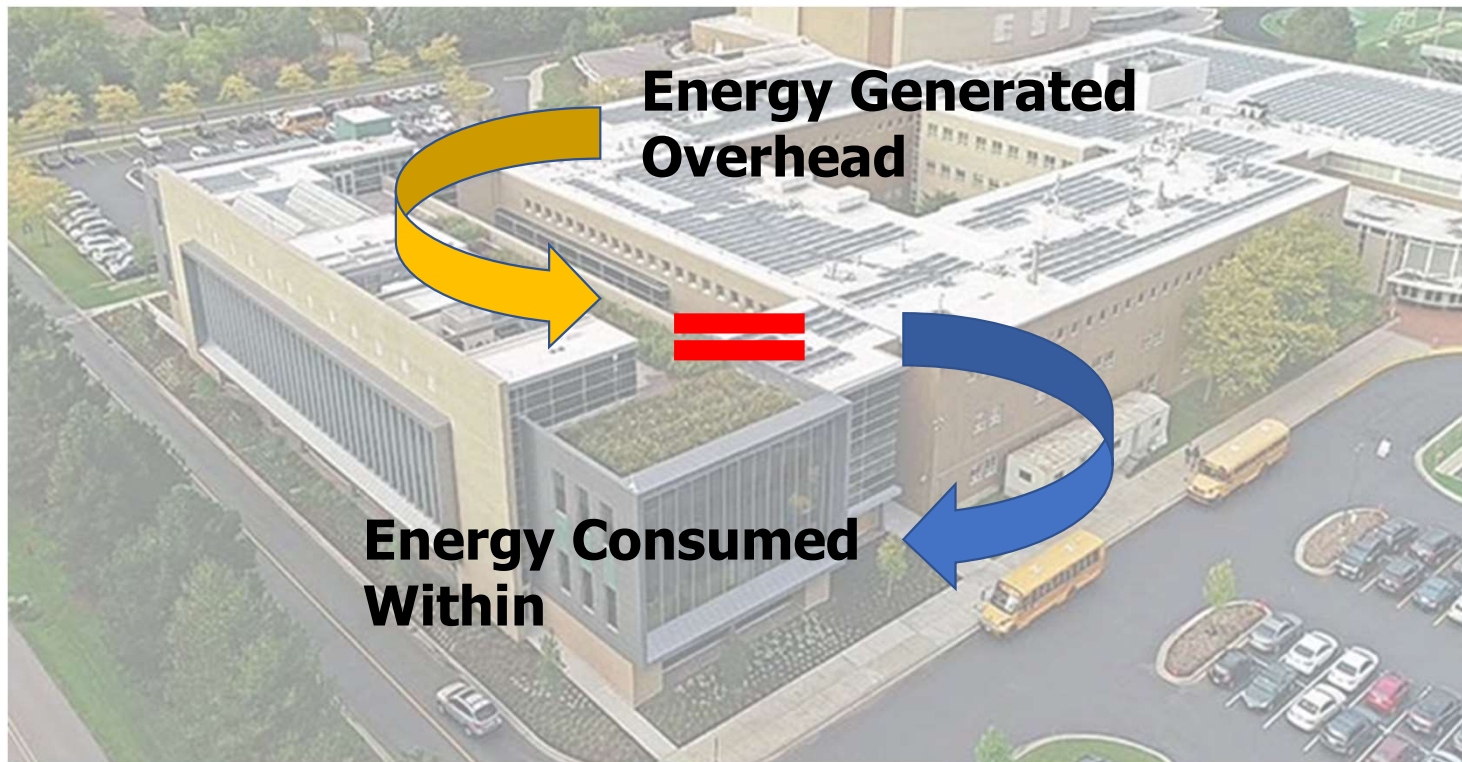


# The Worst Performing Building You Can Building By Law



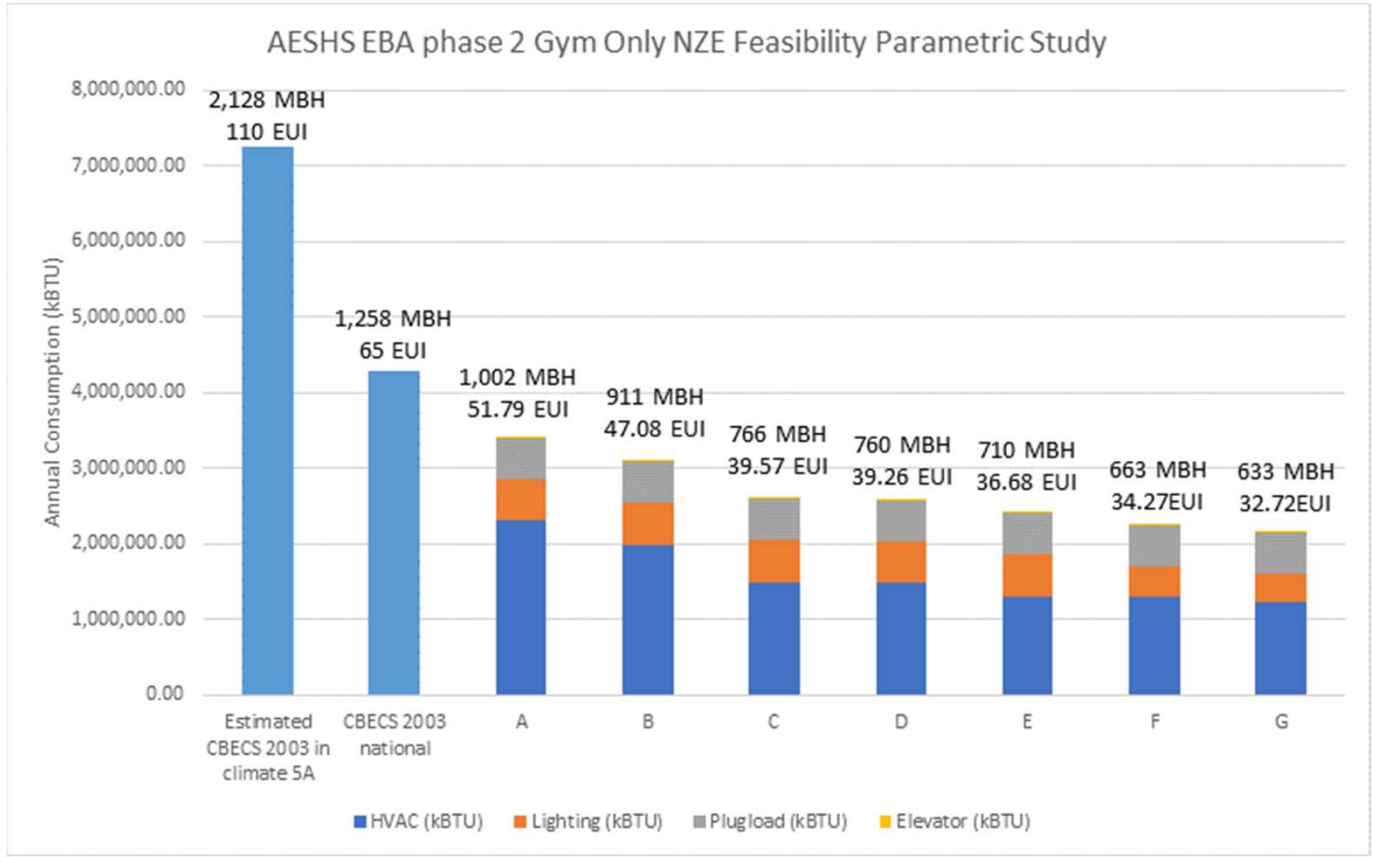
**Figure 2.1.** Improvement in ASHRAE Standard 90/90.1 (1975-2013) with Projections to 2030

# Net Zero Energy






































On an *Annual* Basis





A	Code design with premium HVAC: Heat transfer loop with electric boiler and fluid cooler. (baseline)
B	U-0.18 Window
C	U-0.18 Window + 0.05 infiltration (passive house standard)
D	U-0.18 Window + 0.05 infiltration (passive house standard) + R-20 below entire Slab On Grade
E	U-0.18 Window + 0.05 infiltration (passive house standard) + R-20 below entire Slab On Grade + R-35 Wall and R-60 Roof
F	U-0.18 Window + 0.05 infiltration (passive house standard) + R-20 below entire Slab On Grade + R-35 Wall and R-60 Roof + 70% Lighting
G	U-0.18 Window + 0.05 infiltration (passive house standard) + R-20 below entire Slab On Grade + R-35 Wall and R-60 Roof + 70% Lighting + 14 hour operation (17 hours originally)

	Performance or Design	Metric	Boundary	Combustion Allowed?	Efficiency Required?	Offsite RE Allowed?	Other Reqs.
					NC: 70% EBB* EB: 50% EBB (both w PV)	Yes. Using the offsite RE exception.	Must include on-site storage; 20% embodied carbon reduction + EC offset
					Highest efficiency	Yes, must be local. 75% of roof for solar.	
				Exceptions for EB and Emergency Power	NC: 25% < 90.1-2010 EB: 30% < CBECS	Yes. Must be <i>Additional</i> .	10% Embodied Carbon Reduction + Carbon offsets for the remainder
					No, but LEED Certified	Yes. See tiered structure for on- and offsite RE	Must be LEED-NC or EBOM certified. Performance in Arc.
					LEED v4.1 ASHRAE 90.1 - 2016		TOU Option for LZC.
	 Or 				Must meet ASHRAE 90.1-2016 (Or other listed standard)	Yes. After onsite. Tiered structure applies discount factor to various options.	
					Yes, stringent load, hygrothermal, and thermal bridging targets - see standard.	Yes. See tiered structure applies discount factor to various options.	Also requires Energy Star and ZERH.

 = Transportation   
  = Embodied Carbon   
  = Site Energy Use   
  = CO2e   
  = Source Energy Use

Chart adapted from Joshua Radoff, WSP, 2020

# Lessons Learned from Delivering Net Zero Energy

## M &V

- Energy model assumptions and equipment performance parameters don't always sync.
- Commissioning is key. And recommissioning.
- Net Zero is a **VERB**. In a performance period, you can't afford to adjust and wait for 30 days of results.
- Someone must be tasked with monitoring all the systems frequently.
- Problems are best solved with integrated team approach.

## Operation

- Use the warranty period to keep trade contractors and equipment manufacturers engaged.
- The weather is going to be different than the weather model files.
- It's not always the weather. But you will become very weather conscious.
- Explore the comfort parameters and see if you can expand the comfort zone.
- If you think it's challenging to be net zero, you're right. So far...because it's a new practice...but shouldn't we apply this scrutiny to all buildings?



# In Illinois

3 verified  
13 emerging

ZE Status	State or Province	Name	Certifications	City	Building Type	Size (sf)	Total Site EUI	Net Site EUI
Verified	IL	Adlai E. Stevenson High School EBA I Science Addition	LEED, ILFI	Lincolnshire	Education	54,000	32	-3
Verified	IL	Carroll Center - Park District of Oak Park	PHIUS+ Sourc..	Oak Park	Public Assembly	7,700	5	-6
Verified	IL	Techny Prairie Activity Center - Northbrook Park District	PHIUS+ Sourc..	Northbrook	Public Assembly	44,200	27	0
Emerging	IL	Academy for Global Citizenship		Chicago	Education			
Emerging	IL	Adlai E. Stevenson High School EBA II Fieldhouse		Lincolnshire	Education	62,259		
Emerging	IL	Countryside Municipal Complex		Countryside	Public Assembly	34,700		
Emerging	IL	Electrical and Computer Engineering Building and Univ..		Champaign	Education	250,000		
Emerging	IL	Heartland Community College Agriculture Complex		Normal	Education	30,000		
Emerging	IL	Lake County Forest Preserves Environmental Educatio..		Libertyville	Education			
Emerging	IL	Oak Park Residence Corporation: 7 Van Buren		Oak Park	Multifamily			
Emerging	IL	Parkview Early Learning Center		Mount Prospect	Education	10,000		
Emerging	IL	Prairie Activity & Recreation Center - Plainfield Park Dis..	PHIUS	Plainfield	Public Assembly	39,776		
Emerging	IL	Saint Joseph's School Addition	PHIUS	Downers Grove	Education	7,000		
Emerging	IL	Sunset Ridge	LEED	Chicago	Education	73,890		
Emerging	IL	Walgreens Evanston Store	LEED	Evanston	Mercantile (Enclos..	14,000	48	-5
Emerging	IL	Willowbrook Wildlife Center		Glen Ellyn	Other	25,000		0



ZE Status	State or Province	Name	Certifications	City	Building Type	Size (sf)	Total Site EU1	Net Site EU1
Verified	IL	Adlai E. Stevenson High School EBA I Science Addition	LEED, ILFI	Lincolnshire	Education	54,000	32	-3
Verified	IL	Carroll Center - Park District of Oak Park	PHIUS+ Sourc..	Oak Park	Public Assembly	7,700	5	-6
Verified	IL	Techny Prairie Activity Center - Northbrook Park District	PHIUS+ Sourc..	Northbrook	Public Assembly	44,200	27	0
Emerging	IL	Academy for Global Citizenship		Chicago	Education			
Emerging	IL	Adlai E. Stevenson High School EBA II Fieldhouse		Lincolnshire	Education	62,259		
Emerging	IL	Countryside Municipal Complex		Countryside	Public Assembly	34,700		
Emerging	IL	Electrical and Computer Engineering Building and Univ..		Champaign	Education	250,000		
Emerging	IL	Heartland Community College Agriculture Complex		Normal	Education	30,000		
Emerging	IL	Lake County Forest Preserves Environmental Educatio..		Libertyville	Education			
Emerging	IL	Oak Park Residence Corporation: 7 Van Buren		Oak Park	Multifamily			
Emerging	IL	Parkview Early Learning Center		Mount Prospect	Education	10,000		
Emerging	IL	Prairie Activity & Recreation Center - Plainfield Park Dis..	PHIUS	Plainfield	Public Assembly	39,776		
Emerging	IL	Saint Joseph's School Addition	PHIUS	Downers Grove	Education	7,000		
Emerging	IL	Sunset Ridge	LEED	Chicago	Education	73,890		
Emerging	IL	Walgreens Evanston Store	LEED	Evanston	Mercantile (Enclos..	14,000	48	-5
Emerging	IL	Willowbrook Wildlife Center		Glen Ellyn	Other	25,000		0

## In Support of Wellness



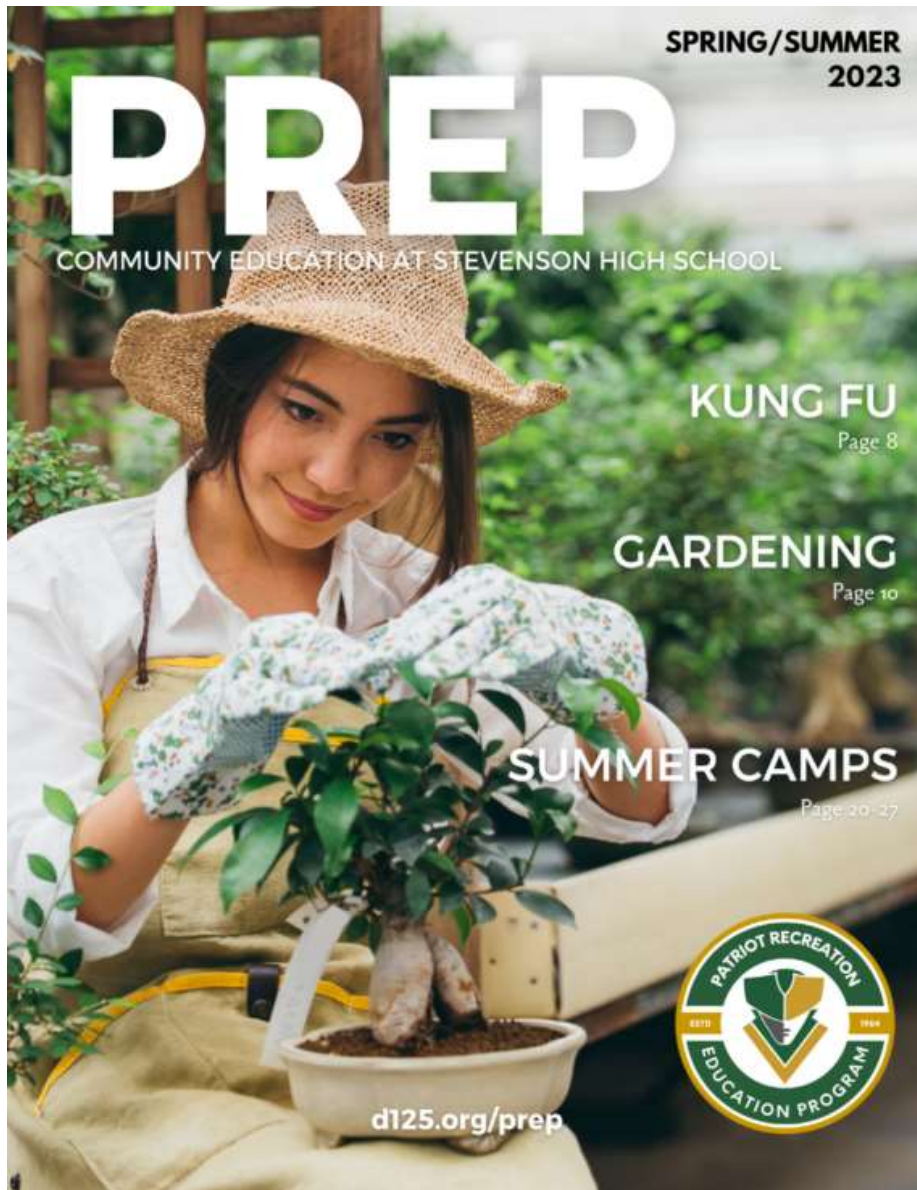
- Daylight and views to the outside are emphasized throughout campus
- A resident nutritionist is available to all students and staff to promote healthy diet decisions
- Social-emotional needs as well as academic support are met through the Student Services Team
- Group fitness and one on one coaching is available to all students
- The fitness facility is open to students and staff before and after class, on weekends, and during the summer



## In Support of Wellness



Provide spaces for students relax, collaborate, and socialize with a variety of seating options



SPRING/SUMMER  
2023

# PREP

COMMUNITY EDUCATION AT STEVENSON HIGH SCHOOL

KUNG FU  
Page 8

GARDENING  
Page 10

SUMMER CAMPS  
Page 20-27



[d125.org/prep](http://d125.org/prep)

PATRIOT RECREATION EDUCATION PROGRAM  
AT STEVENSON HIGH SCHOOL

# CONTENTS



REGISTER ONLINE AT [D125.ORG/PREP](http://D125.ORG/PREP)

- 04 CULINARY ARTS
- 06 DANCE
- 07 FINE ARTS
- 08 HEALTH & WELLNESS
- 13 PATRIOT AQUATICS & SHS SPORTS

REGISTER ONLINE AT  
[D125.ORG/PREP](http://D125.ORG/PREP)

- 14 ONLINE LEARNING
- 17 PRIVATE MUSIC LESSONS
- 18 SPECIAL INTEREST
- 21 SPORTS & SPORTS CAMPS
- 26 S.T.E.A.M. (SCIENCE, TECHNOLOGY, ENGINEERING, ARTS, MATHS)
- 28 REGISTRATION INFORMATION

HEALTH & WELLNESS

CULINARY ARTS

1 STEVENSON DRIVE,  
LINCOLNSHIRE, IL 60069  
847-415-4145  
[PREP@D125.ORG](mailto:PREP@D125.ORG)

[D125.ORG/PREP](http://D125.ORG/PREP)



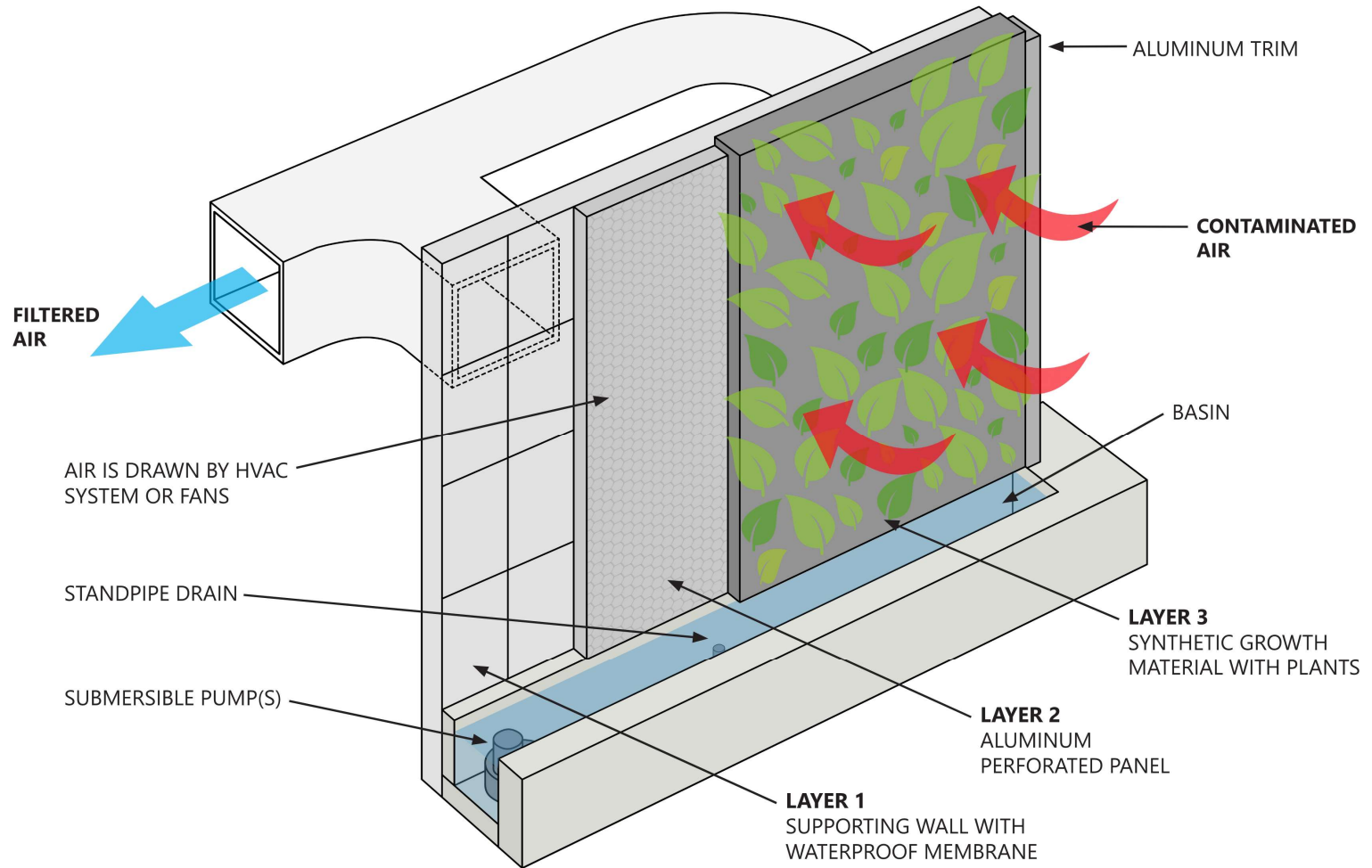


# In Support of Wellness

- Covid response measures
  - MERV 13/8
  - UV
  - Bi-polar Ionization
- Design for increased ventilation
  - Ventilation capacity of existing buildings
- Operable windows
- Indoor air quality monitors



# Living Wall Integration in Mechanical System

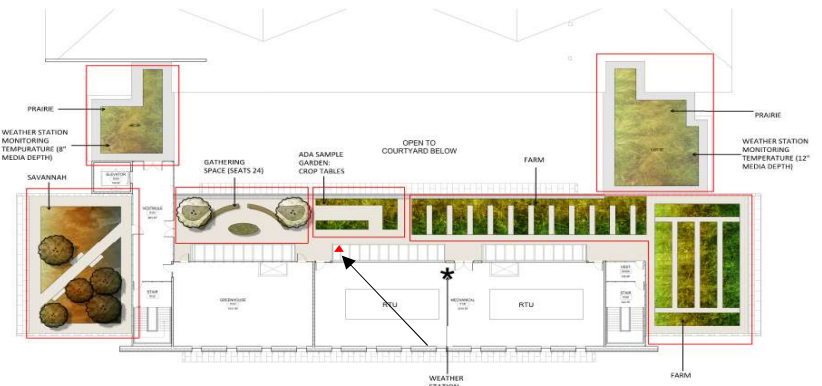


# Environmental Consciousness

- Single stream recycling
- Composting (beyond food scraps-“organic recycling”)
- Homecoming Giving Week
- Give-a-thon
- 300 Hour Club
- Green Team (student centric)
- Building as Pedagogy



# Building as Pedagogy: Green Roof Urban Agriculture



# Building as Pedagogy



# HEALTH AND WELLNESS RATING SYSTEM COMPARISON

With the emergence of health as a driver in planning, design, construction, and operations, a handful of building rating systems have begun to address and measure wellness-promoting features and strategies. This graphic highlights how LEED, the Living Building Challenge, WELL, and Fitwel compare on a variety of health-related priorities.

## HEALTH AND WELLNESS RATING CATEGORIES



### RATING SYSTEMS

LEED v4 BD+C  
LEED Pilot Credits  
WELL v1 May-16  
Living Building Challenge (LBC) 3.1  
Fitwel v1

### HOW THEY ADDRESS HEALTH CATEGORIES

- Covered in detail
- Covered, but not in great detail
- Addressed, but leaves out some aspects
- Not Covered
- ✓ Includes onsite performance measurements
- ◆ Prerequisite or prerequisite
- 3, + See footnote for more information

### VERTICAL

Health has always been a core component of a truly sustainable building project. As the connection between health and the built environment broadens to areas not covered by early versions of LEED, the need for a metric that addresses these qualities in a more comprehensive manner has become necessary.

### HORIZONTAL

It is possible to have a LEED-certified building that lacks onsite greenspace, basic walkability, or public transportation access. WELL similarly emphasizes the building itself and focuses less on the importance of neighborhood and connectivity. The Living Building Challenge, in contrast, has required imperatives covering car-free living, onsite agriculture, and biophilia. Fitwel has a big focus on active design.

## BUILDING

	LEED v4	LEED Pilot	Well v1	LBC 3.1	Fitwel v1
Active Design		1	◆	◆	
Biophilia			◆	◆	2
On-site Food Options		3	◆ 4	◆ 5	6
Materials Specification <i>Life Cycle Health Impact</i>		7		◆	
Daylight			✓	◆ 8	9
Interior Light Quality			◆		
Natural Ventilation				◆	
Thermal Comfort			◆		10
Air Quality <i>VOCs, Flush Out, Testing, etc.</i>	◆ testing optional		◆ ✓	◆	12
Drinking Water Quality			◆ ✓		
Acoustics	◆ 13 for schools	14	◆ ✓	15	
Mental Health		16			17
Ergonomics/ Adjustable Furniture		18	◆		19

## LOCATION & SITE

	LEED v4	LEED Pilot	Well v1	LBC 3.1	Fitwel v1
Walkability	20	21	22	◆ 23	
Public Transportation Access					24
Proximity to Green Space					
Onsite Green Space Creation					25
Proximity to Health Food Options	*			★	26
Services and Employment Access					27
Safety		28			29
Resilient Community		30	★	31	32

## OPERATIONS & MANAGEMENT

	LEED v4	LEED Pilot	Well v1	LBC 3.1	Fitwel v1
Ongoing IAQ Management	*	33	✓	34	
Healthy Behavior Promotion		35			

## RATING SYSTEM MECHANICS

	LEED v4	LEED Pilot	Well v1	LBC 3.1	Fitwel v1
Third Party Certified <b>36</b>	Yes		Yes	Yes	Yes
Certification Costs	Medium		High	Medium	Low <b>37</b>
Recertification	None*		Every 2 Years	None	None <b>38</b>
Number of Health-Related Prerequisites	2		<b>37 39</b>	All	None
Market Maturity	High		Medium	Medium	Low <b>40</b>
General Environmental Benefit <b>41</b>		Comprehensive ◆		Comprehensive ◆ ✓	

## **From Sloppy Joes to Sushi:**

How school cafeterias have changed in both food and design, and why this matters for children



Child nutrition connected to

- Physical development
- Behavior
- Emotional well-being



**Healthy meals  
raise student  
achievement**

**4** percentage  
points on  
average\*

*“School Lunch Quality & Academic Performance”*

\*California State Department of Education and Economics at University California Berkley study over 5 years at 9,700 schools.



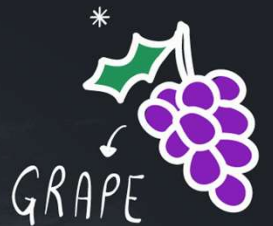
*This is not about serving children  
healthier school lunches*

*This is about*

**ENTICING**

*children to eat*

**HEALTHIER**





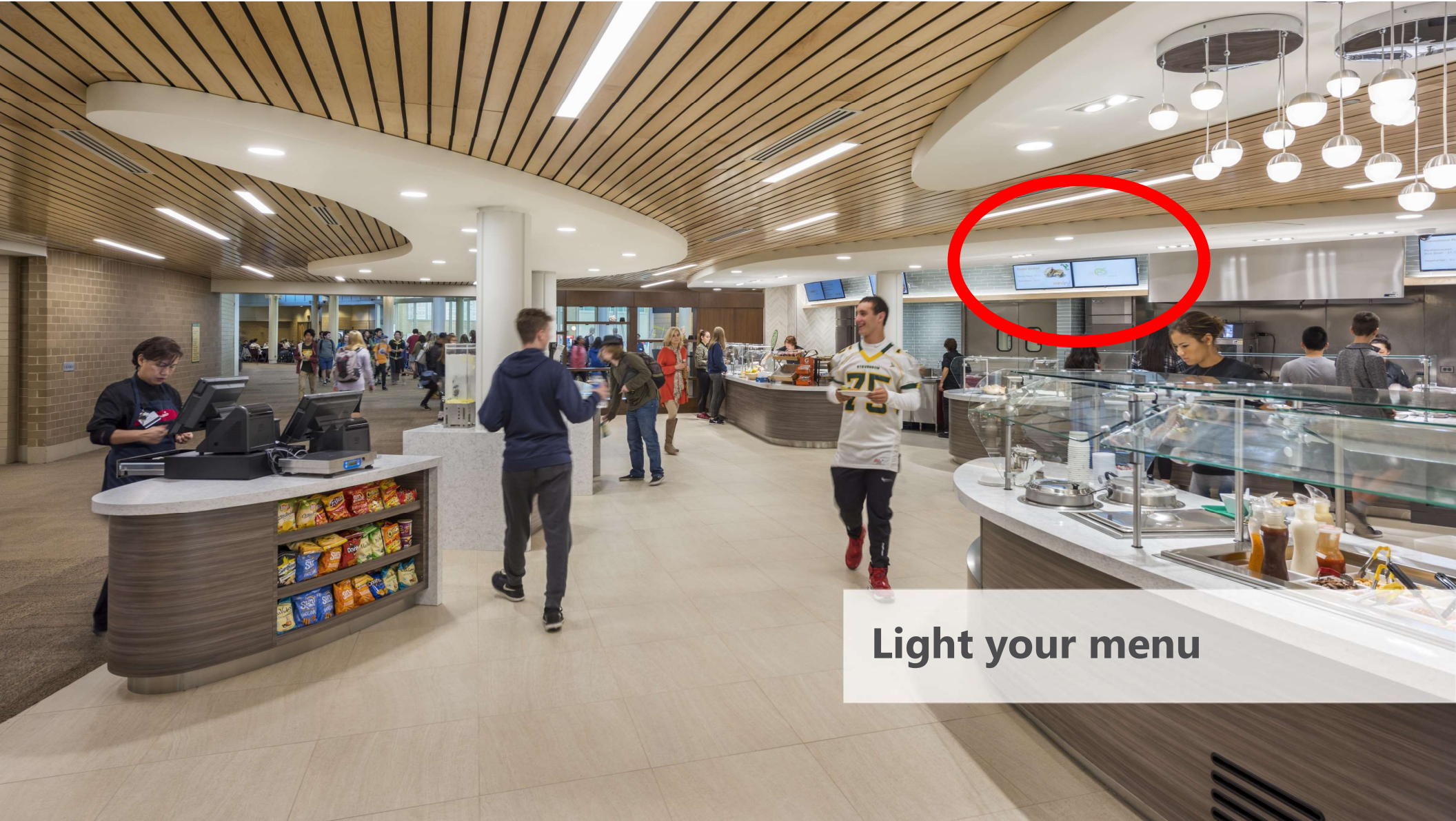
How can the space encourage change?



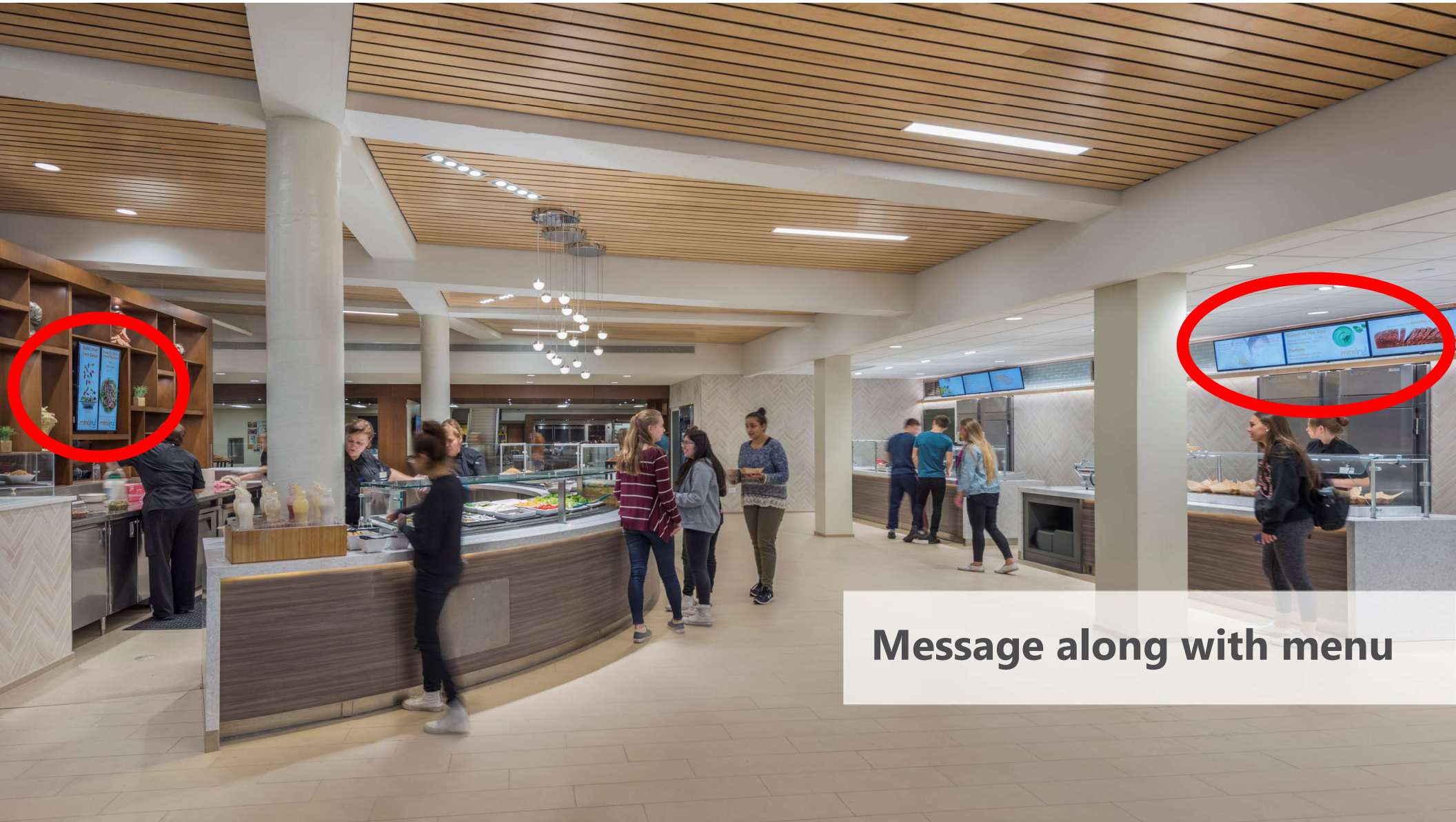
Existing Serving Line



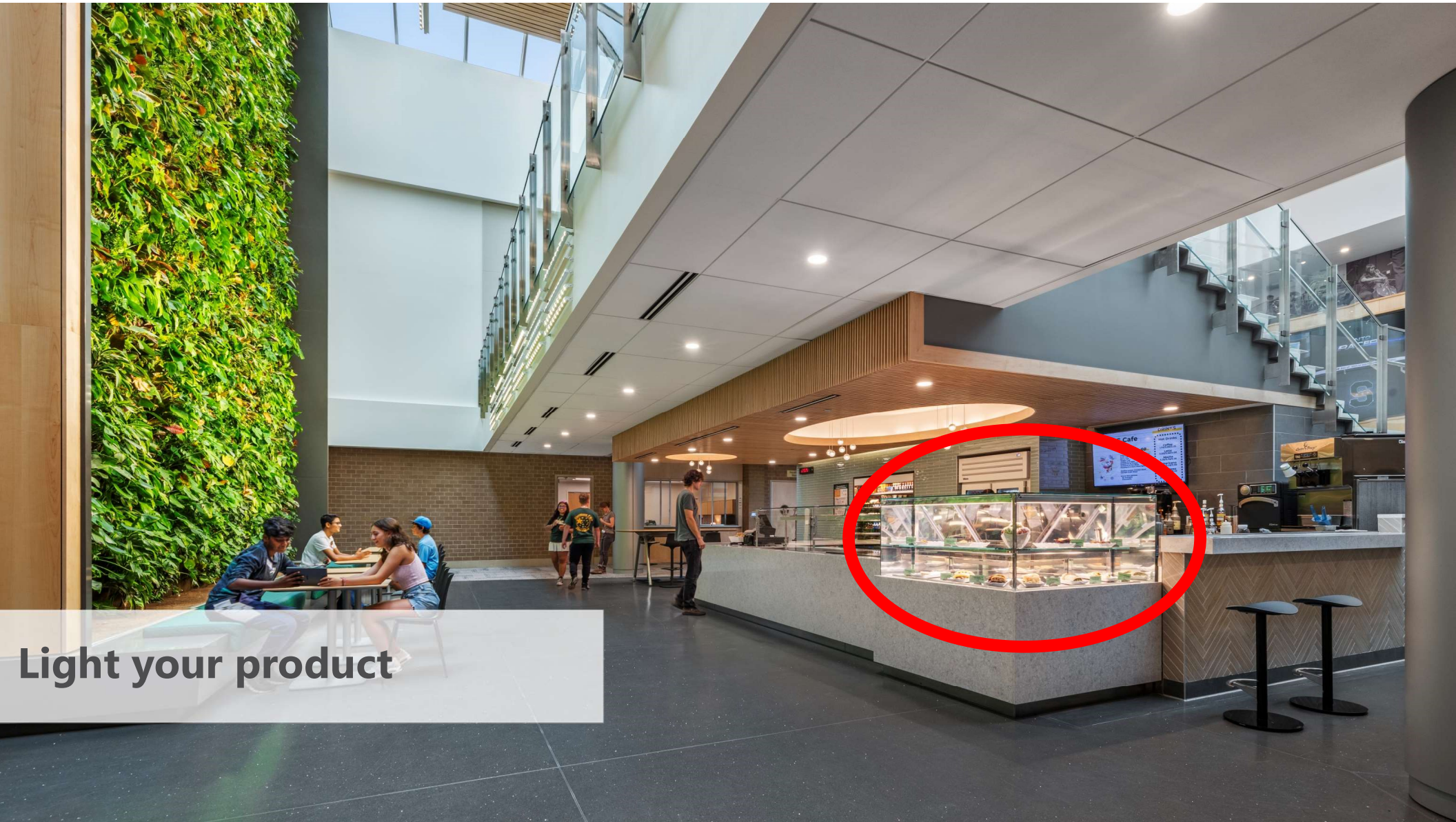




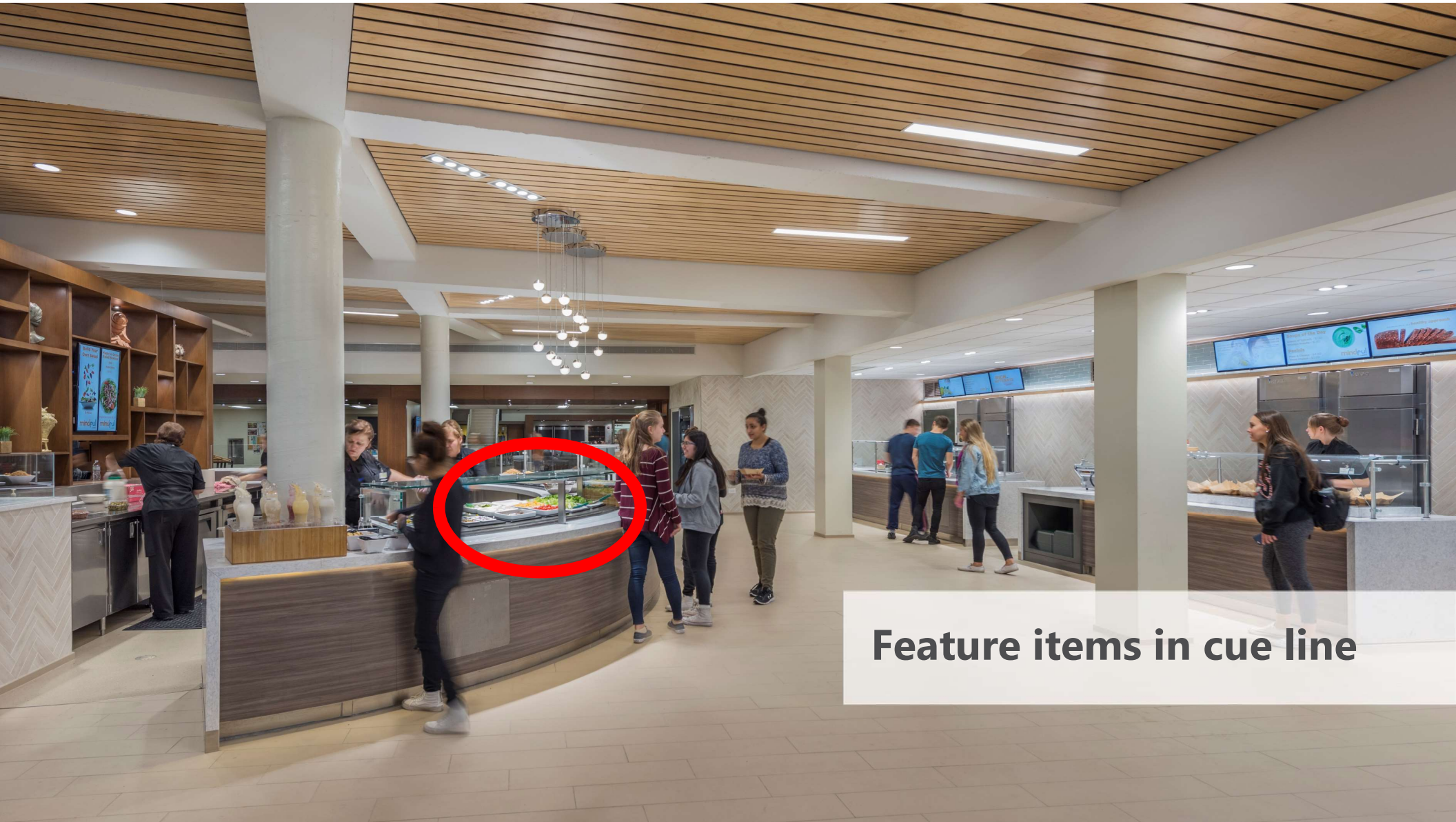
**Light your menu**



**Message along with menu**

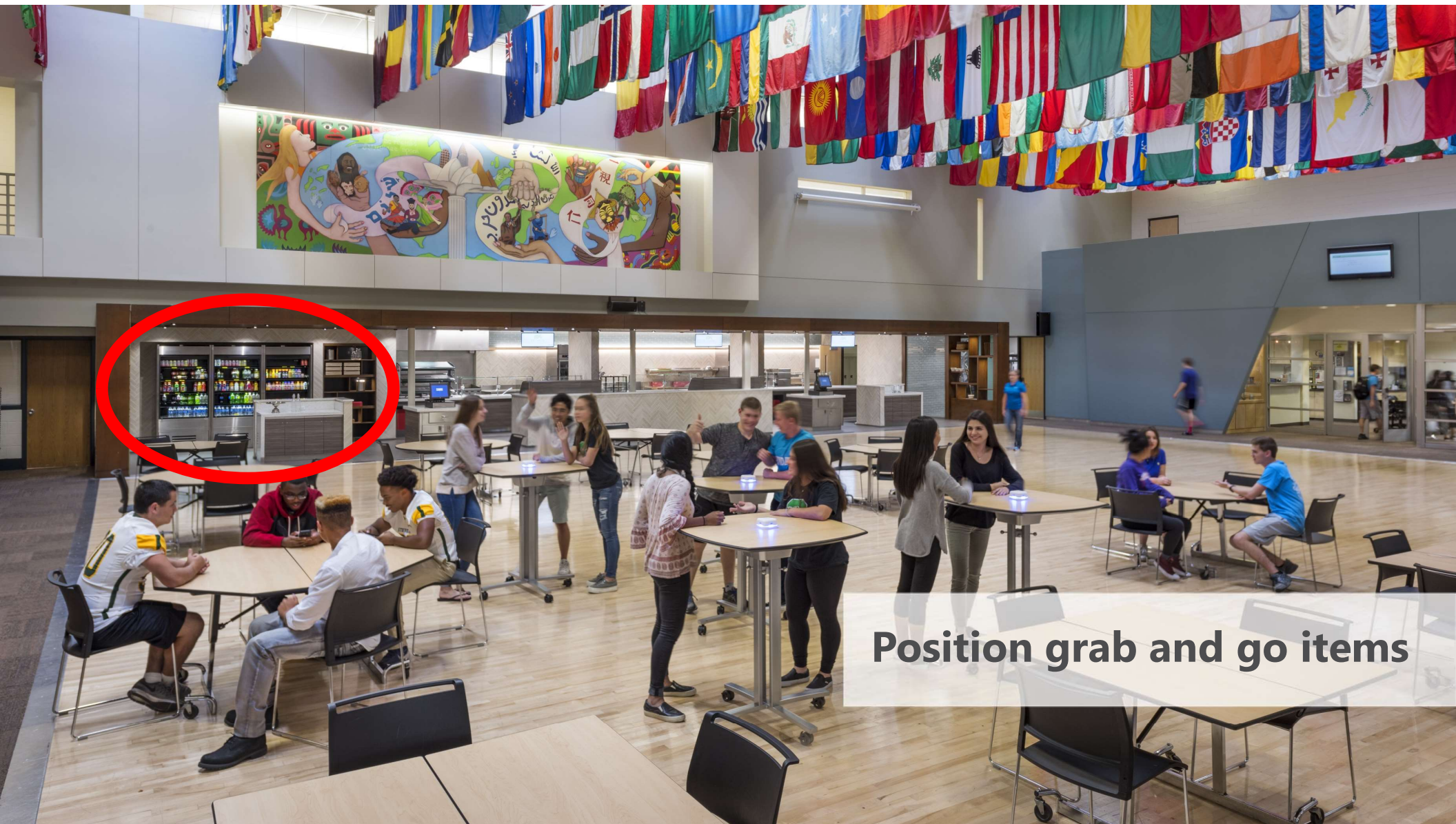


**Light your product**



**Feature items in cue line**





**Position grab and go items**



**Variety of group sizes**

## Lighting Makes a Difference

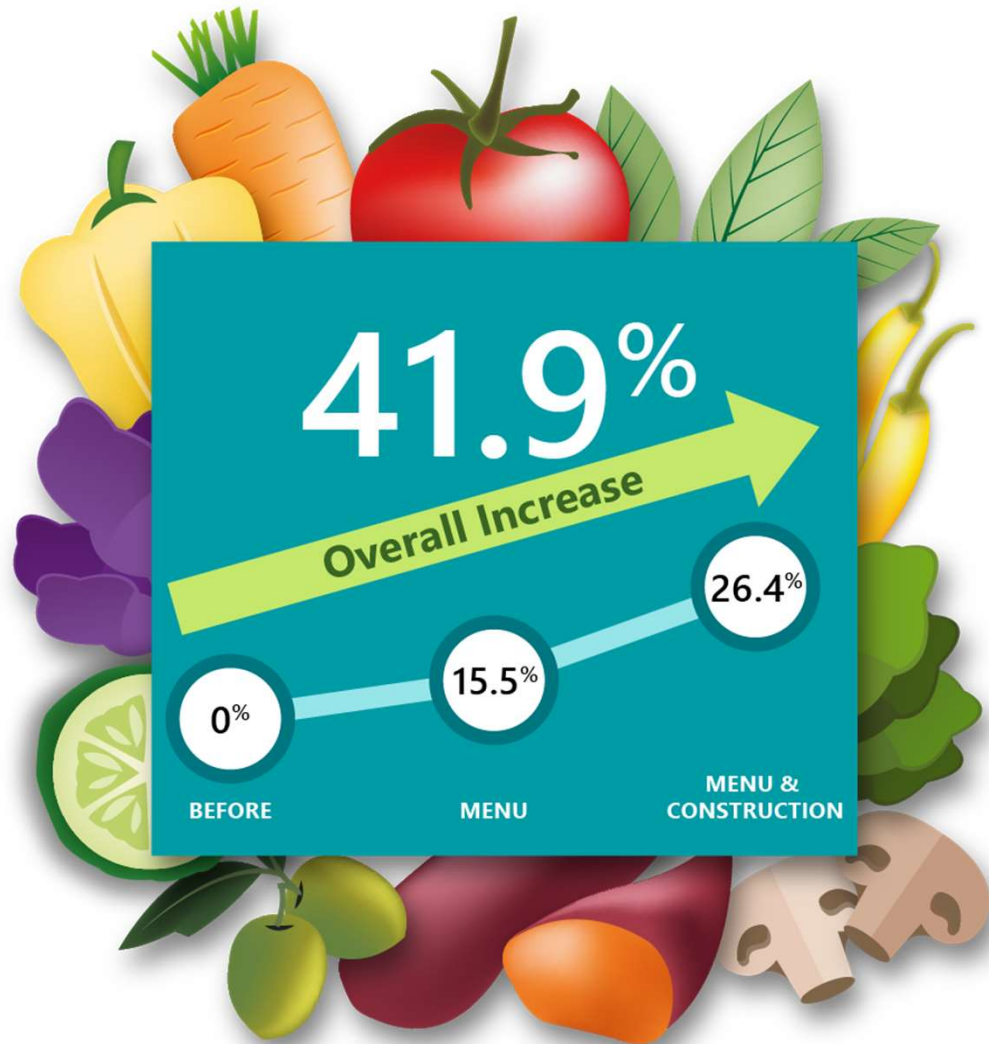


**CRI (Ra) < 70**



**CRI (Ra) > 80**

Healthy Food First  
Flow around serving  
Personalized choice  
More than menu on display  
Lighting, lighting & more lighting  
Color Rendering Index (CRI)



# School Year 2016/2017

Burgers	-5,200
Salads	+10,000

over one year

French fry sales declined from  
**\$144,000 to \$50,000**



# Before & After

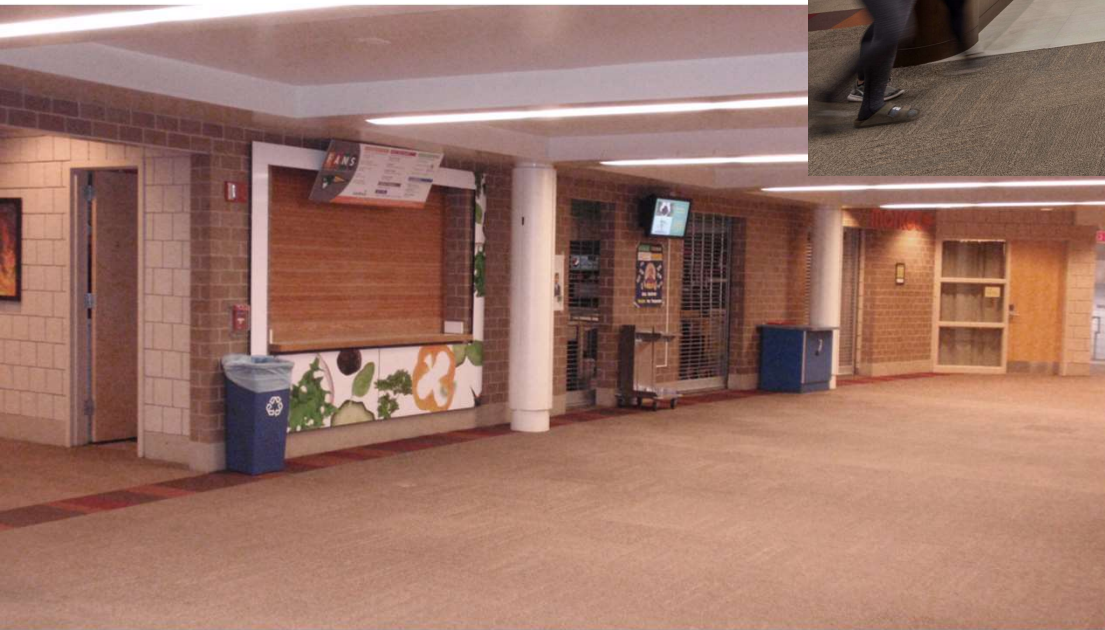


# Before & After

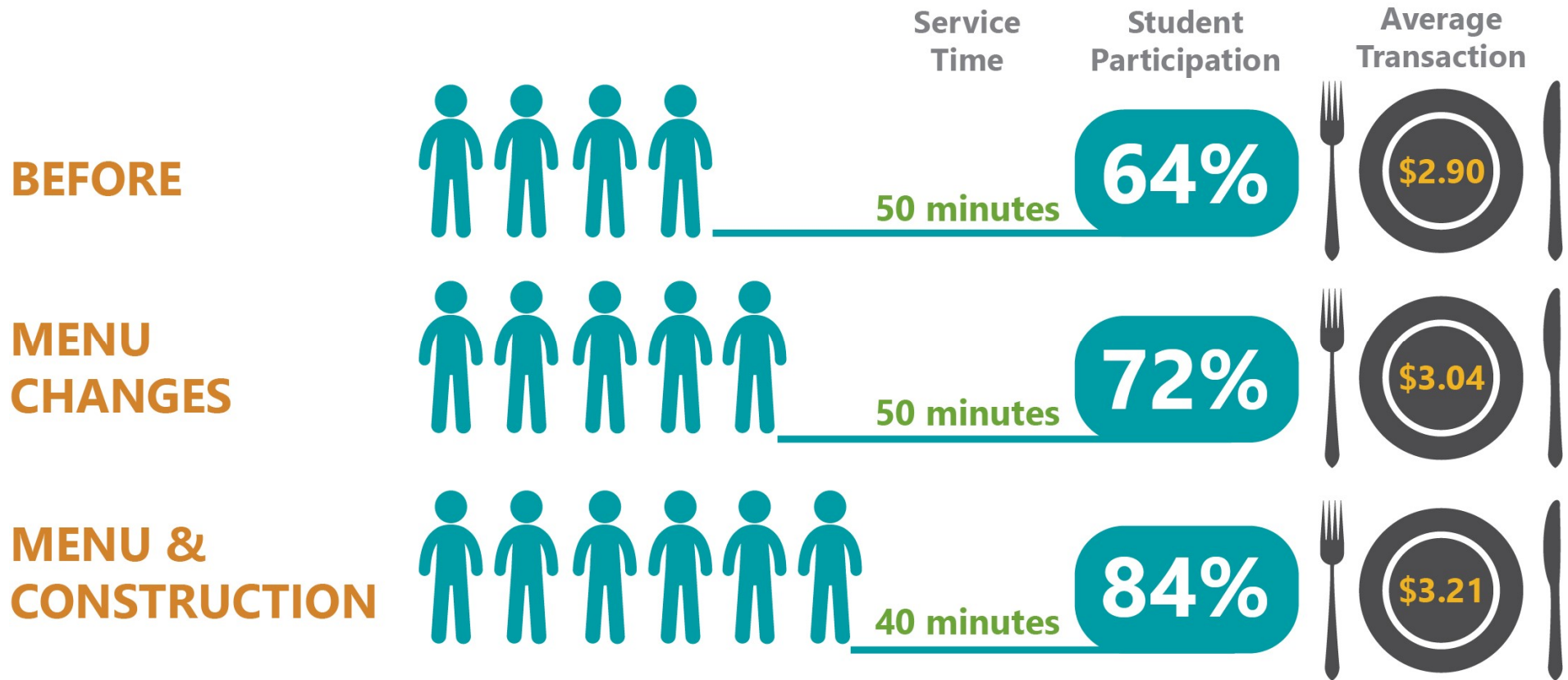




# Before & After



# Quantifiable Data





**Thank You!**