

Building Excellence

The Financial & Human Case for High-Performance Schools

IHED



Engagement

1. What are attributes of a High Performance School?
2. What knowledge gaps exist?
3. What challenges are there to achieving a high performance school?
4. What additional tools can we provide?



IHED



Today's Session Team



**Mary
Ruppenthal, FAIA**
HED
ARCHITECT |
EDUCATION
SECTOR LEADER



**Christos
Chrysiliou, FAIA**
Los Angeles USD
(LAUSD)
CHIEF ECO-SUSTAINABILITY
OFFICER



**Ida
Clair, FAIA**
Division of the State
Architect
STATE ARCHITECT



Who are you?

What is your role in enhancing educational environments?



I-HED





1 WHAT IS A HP SCHOOL?
WHAT ARE THE BENEFITS?

2 LOS ANGELES USD
MEASURABLE IMPACT

3 DSA
WHERE WE ARE & ARE GOING

4 RESOURCES / CONTACT

HED



DSA
DIVISION OF THE STATE ARCHITECT
DEPARTMENT OF GENERAL SERVICES

What is a High Performance Environment?

01 Financial & Student
Centered Outcomes

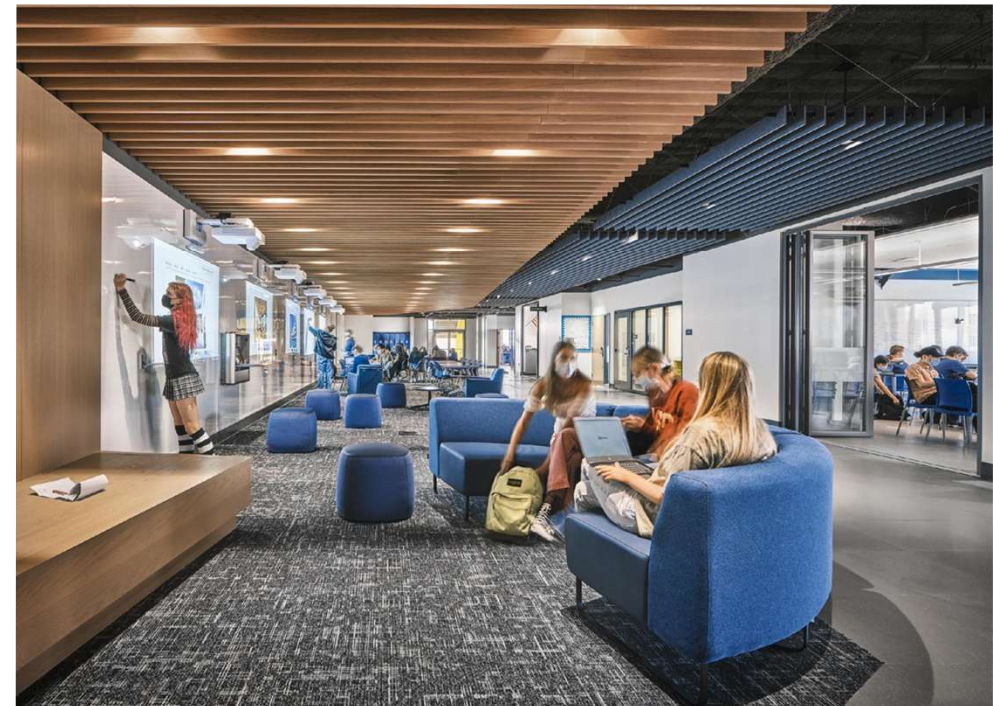
ADVANCING YOUR WORLD.

IT IS OUR PROMISE THAT THROUGH
THE **POSITIVE IMPACT** OF DESIGN,
OUR TEAMS CAN CREATE
EXCEPTIONAL, SUSTAINABLE
SOLUTIONS FOR OUR CLIENTS, THE
COMMUNITY AND **THE WORLD.**

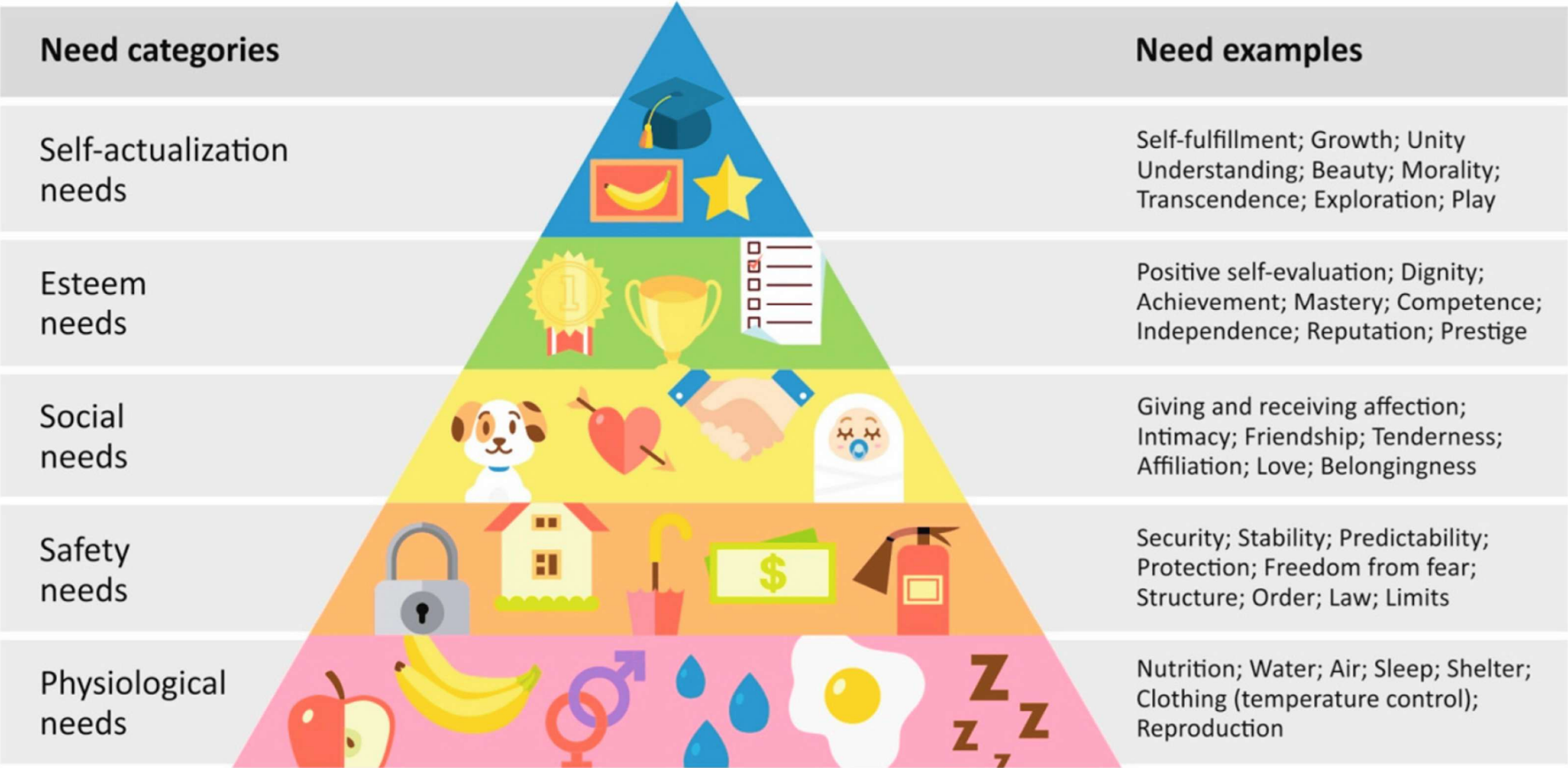
HED

What is a High Performance School?

- Code
- Sustainable
- Responsive to Climate Realities
- Health and Wellness
- Flexible
- Builds Community
- Conserving Resources
- Future Forward
- Adaptable
- Maximizing daylight
- Welcoming
- Educational
- Aspirational
- A Teaching Tool
- Great acoustics
- Low-emitting materials
- Efficient and Right-Sized Spaces
- Efficient and Right-Sized Systems
- Renewable materials and energy
- NetZero
- Electrification
- Decarbonization
- Safe and Secure
- Builds Community
- Universally Designed

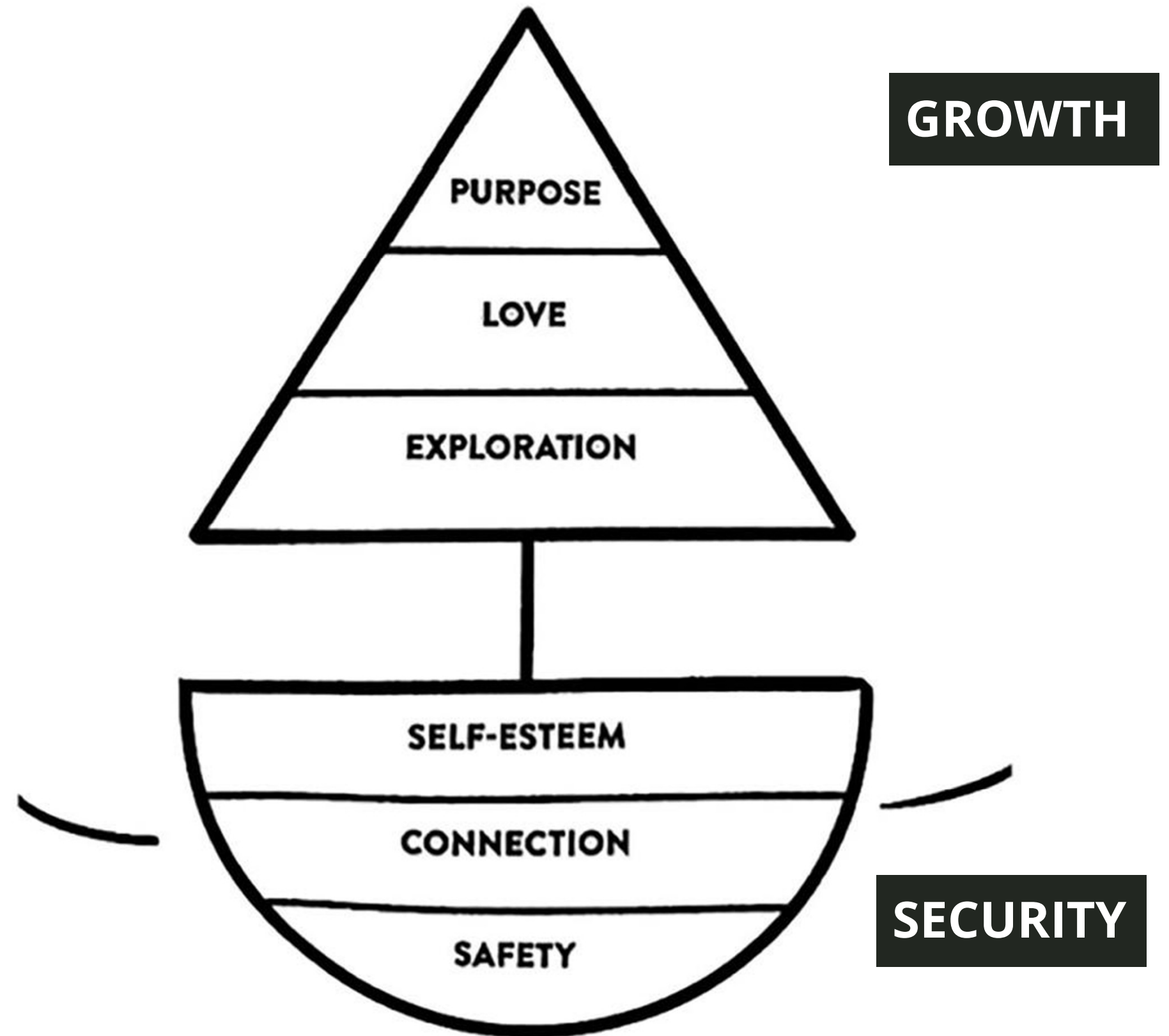


Infuse higher level needs for long term benefits.
Physiological are short term – psychological benefits are long term.



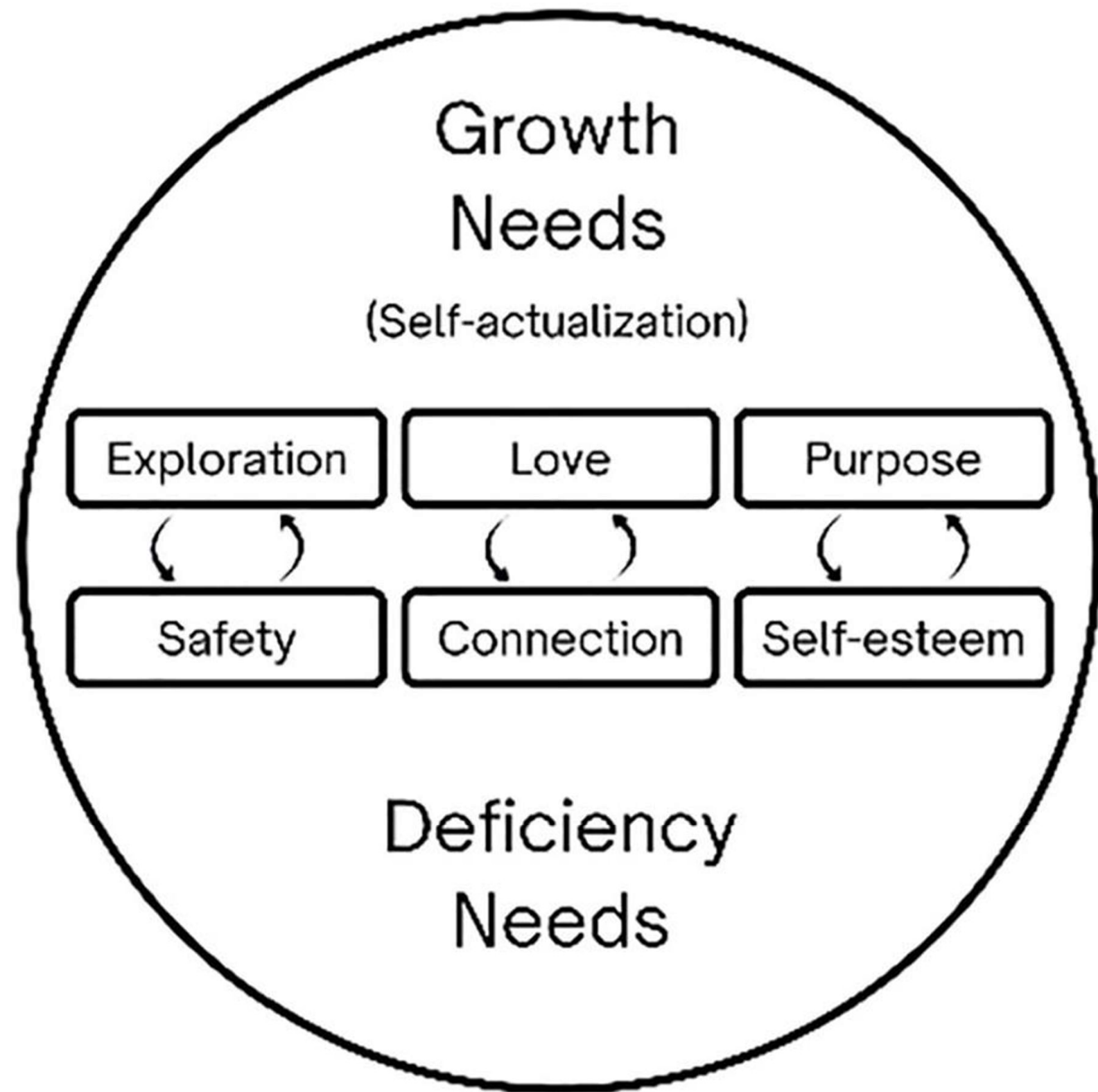
Maslow's hierarchy is an interrelated set of variants that needs to work together toward a higher purpose.

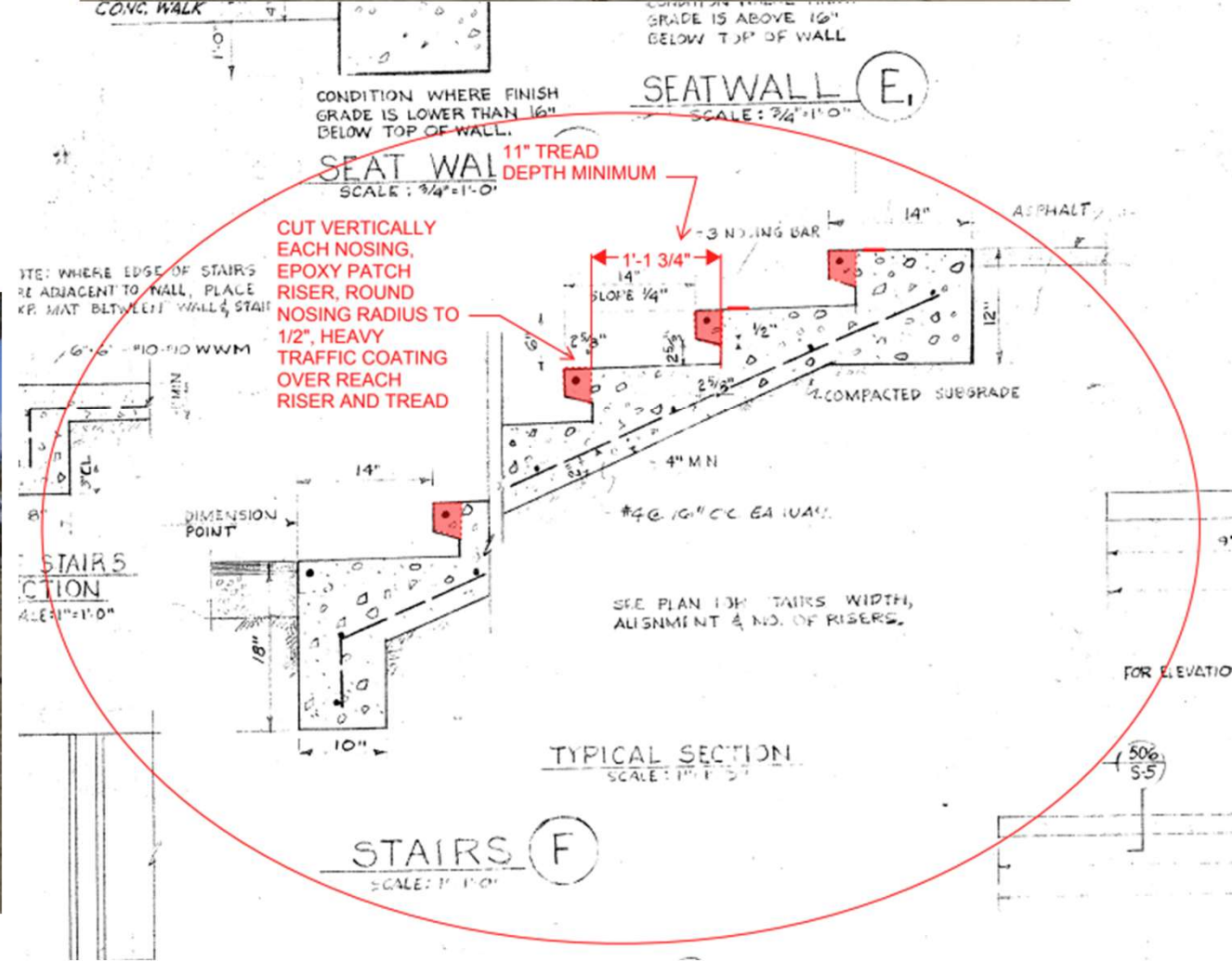
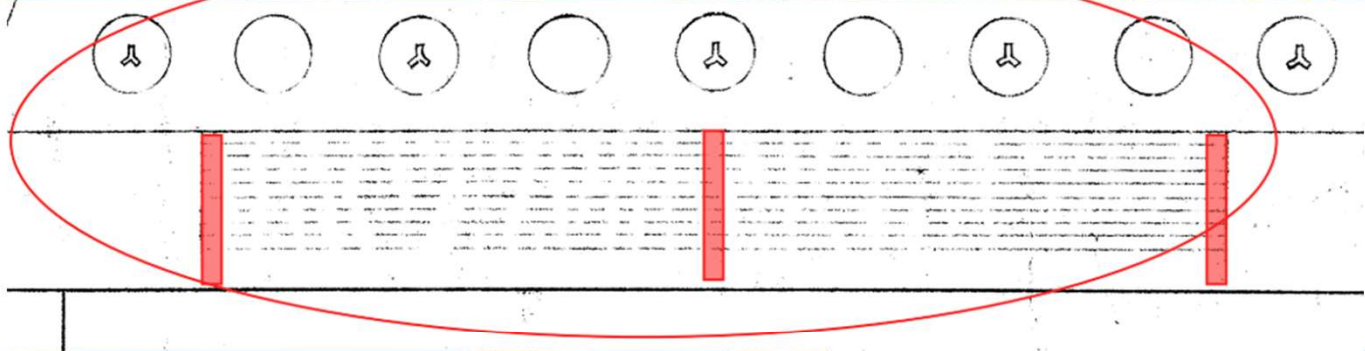
Like our educational environments, these needs are interrelated.



The call to Action:

When scoping projects, ensure that Growth Needs are Optimized along with the Deficiency Needs



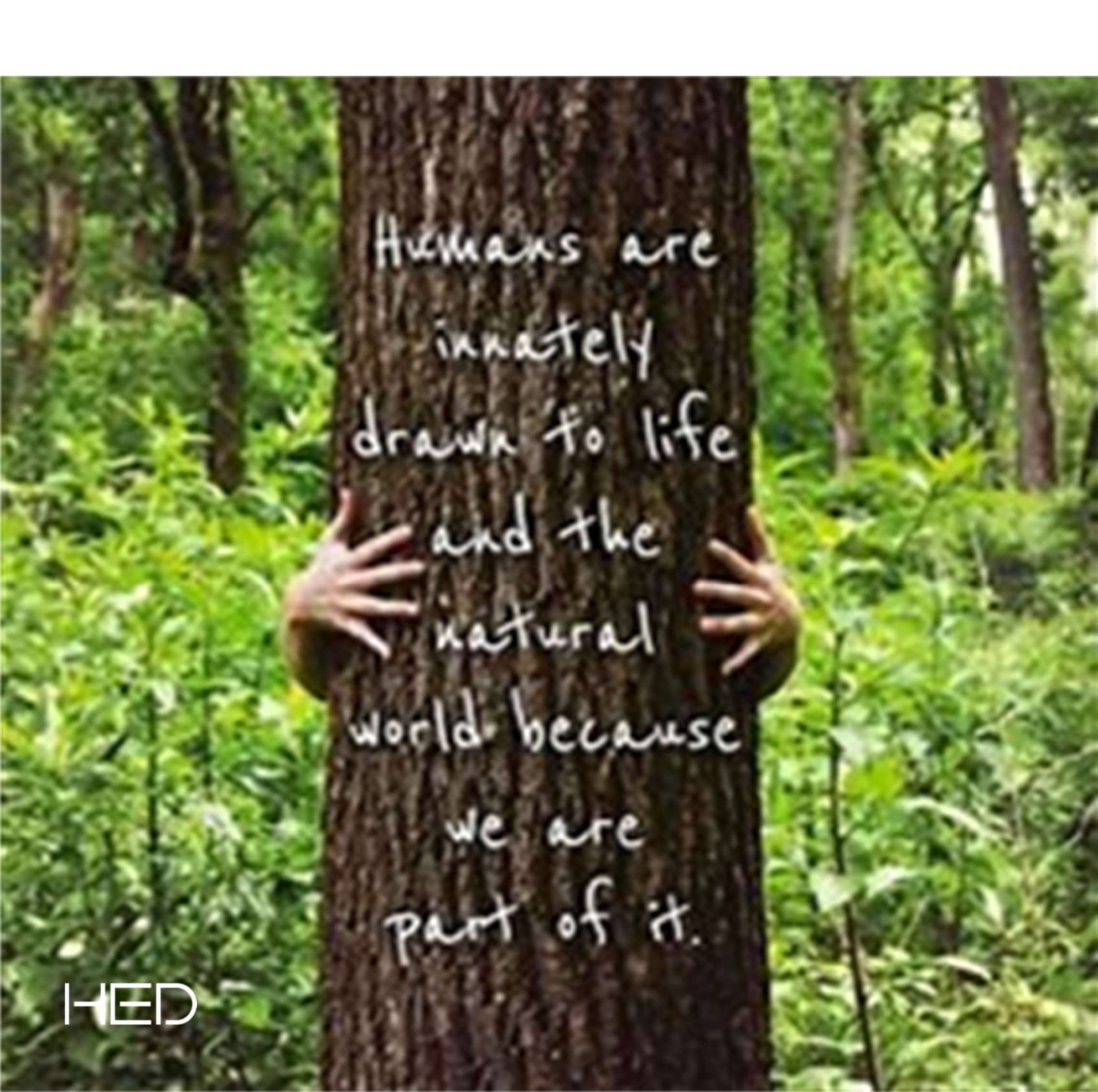




Attributes that provide physiological benefits:

1. The need for change (comfortable variations in light, air, temperature, etc.)
2. The ability to act on our environment and see the effects of our actions
3. Meaningful stimuli
4. Places of refuge
5. Positive view to the outside





Humans are
innately
drawn to life
and the
natural
world because
we are
part of it.

HED

Principles of Biophilia

Visual Connection with Nature
Non-Visual Connection with Nature
Non-Rhythmic Sensory Stimuli
Thermal & Airflow Variability
Presence of Water
Dynamic and Diffuse Light
Connection with Natural Systems
Biomorphic Forms and Patterns
Material Connection with nature
Complexity & Order
Prospect
Refuge
Mystery
Risk/Peril



14 PATTERNS	*	STRESS REDUCTION	COGNITIVE PERFORMANCE	EMOTION, MOOD & PREFERENCE
NATURE IN THE SPACE	Visual Connection with Nature	★ Lowered blood pressure and heart rate (Brown, Barton & Gladwell, 2013; van den Berg, Hartig, & Staats, 2007; Tsunetsugu & Miyazaki, 2005)	Improved mental engagement/ attentiveness (Biederman & Vessel, 2006)	Positively impacted attitude and overall happiness (Barton & Pretty, 2010)
	Non-Visual Connection with Nature	★ Reduced systolic blood pressure and stress hormones (Park, Tsunetsugu, Kasetani et al., 2009; Hartig, Evans, Jamner et al., 2003; Orsega-Smith, Mowen, Payne et al., 2004; Ulrich, Simons, Losito et al., 1991)	Positively impacted on cognitive performance (Mehta, Zhu & Cheema, 2012; Ljungberg, Neely, & Lundström, 2004)	Perceived improvements in mental health and tranquility (Li, Kobayashi, Inagaki et al., 2012; Jahncke, et al., 2011; Tsunetsugu, Park, & Miyazaki, 2010; Kim, Ren, & Fielding, 2007; Stigsdotter & Grahn, 2003)
	Non-Rhythmic Sensory Stimuli	★ Positively impacted on heart rate, systolic blood pressure and sympathetic nervous system activity (Li, 2009; Park et al, 2008; Kahn et al., 2008; Beauchamp, et al., 2003; Ulrich et al., 1991)	Observed and quantified behavioral measures of attention and exploration (Windhager et al., 2011)	
	Thermal & Airflow Variability	★ Positively impacted comfort, well-being and productivity (Heerwagen, 2006; Tham & Willem, 2005; Wigö, 2005)	Positively impacted concentration (Hartig et al., 2003; Hartig et al., 1991; R. Kaplan & Kaplan, 1989)	Improved perception of temporal and spatial pleasure (alliesthesia) (Parkinson, de Dear & Candido, 2012; Zhang, Arens, Huizenga & Han, 2010; Arens, Zhang & Huizenga, 2006; Zhang, 2003; de Dear & Brager, 2002; Heschong, 1979)
	Presence of Water	★ Reduced stress, increased feelings of tranquility, lower heart rate and blood pressure (Alvarsson, Wiens, & Nilsson, 2010; Pheasant, Fisher, Watts et al., 2010; Biederman & Vessel, 2006)	Improved concentration and memory restoration (Alvarsson et al., 2010; Biederman & Vessel, 2006) Enhanced perception and psychological responsiveness (Alvarsson et al., 2010; Hunter et al., 2010)	Observed preferences and positive emotional responses (Windhager, 2011; Barton & Pretty, 2010; White, Smith, Humphries et al., 2010; Karmanov & Hamel, 2008; Biederman & Vessel, 2006; Heerwagen & Orians, 1993; Ruso & Atzwanger, 2003; Ulrich, 1983)
	Dynamic & Diffuse Light	★ Positively impacted circadian system functioning (Figueiro, Brons, Plitnick et al., 2011; Beckett & Roden, 2009) ★ Increased visual comfort (Elyezadi, 2012; Kim & Kim, 2007)		
	Connection with Natural Systems			Enhanced positive health responses; Shifted perception of environment (Kellert et al., 2008)
NATURAL ANALOGUES	Biomorphic Forms & Patterns	★		Observed view preference (Vessel, 2012; Joye, 2007)
	Material Connection with Nature		Decreased diastolic blood pressure (Tsunetsugu, Miyazaki & Sato, 2007) Improved creative performance (Lichtenfeld et al., 2012)	Improved comfort (Tsunetsugu, Miyazaki & Sato 2007)
	Complexity & Order	★ Positively impacted perceptual and physiological stress responses (Salingaros, 2012; Joye, 2007; Taylor, 2006; S. Kaplan, 1988)		Observed view preference (Salingaros, 2012; Hägerhäll, Laike, Taylor et al., 2008; Hägerhäll, Purcella, & Taylor, 2004; Taylor, 2006)
NATURE OF THE SPACE	Prospect	★ Reduced stress (Grahn & Stigsdotter, 2010)	Reduced boredom, irritation, fatigue (Clearwater & Coss, 1991)	Improved comfort and perceived safety (Herzog & Bryce, 2007; Wang & Taylor, 2006; Petherick, 2000)
	Refuge	★ ★ ★	Improved concentration, attention and perception of safety (Grahn & Stigsdotter, 2010; Wang & Taylor, 2006; Wang & Taylor, 2006; Petherick, 2000; Ulrich et al., 1993)	
	Mystery	★ ★		Induced strong pleasure response (Biederman, 2011; Salimpoor, Benovoy, Larcher et al., 2011; Ikemi, 2005; Blood & Zatorre, 2001)
	Risk/Peril	★		Resulted in strong dopamine or pleasure responses (Kohno et al., 2013; Wang & Tsien, 2011; Zald et al., 2008)

Human Biological responses to nature: The Science Supporting the Benefits

Measurable Positive Returns:

TABLE 1. BIOPHILIA IMPACTS FOR POSITIVE RETURNS			
INDICATOR	HEALTH & WELL-BEING IMPACTS	FINANCIAL IMPACTS	
SECTOR		DIRECT	INDIRECT
OFFICES	presenteeism, performance, productivity	absenteeism, staff retention; lease rate, churn	talent acquisition, health claims, employee satisfaction
EDUCATION	attention, learning rate	absenteeism, test scores	graduation rates
RETAIL	customer attention, brand perception	hedonic value, sales; staff retention	dwell time, return patronage, social media attention
HEALTHCARE	healing rate, analgesic intake	patient turnover; staff retention	visitor perception
HOSPITALITY	staff performance, perception of place	average daily room rate (ADR, RevPAR)	employee satisfaction, brand loyalty, social media attention; total revenue per available room (TRevPAR)
COMMUNITIES	perception of safety, crime rate; overall public health	tourism; crime rate	investment attraction, migration; real estate value, tax base; climate change adaptability, resilience, equity; incarceration rate

What could this look like?

Interior | Look + Feel

- Humans are innately drawn to nature
- Biophilic: provide clarity, reduce stress, improve well-being
- Forms, patterns, colors and texture from nature

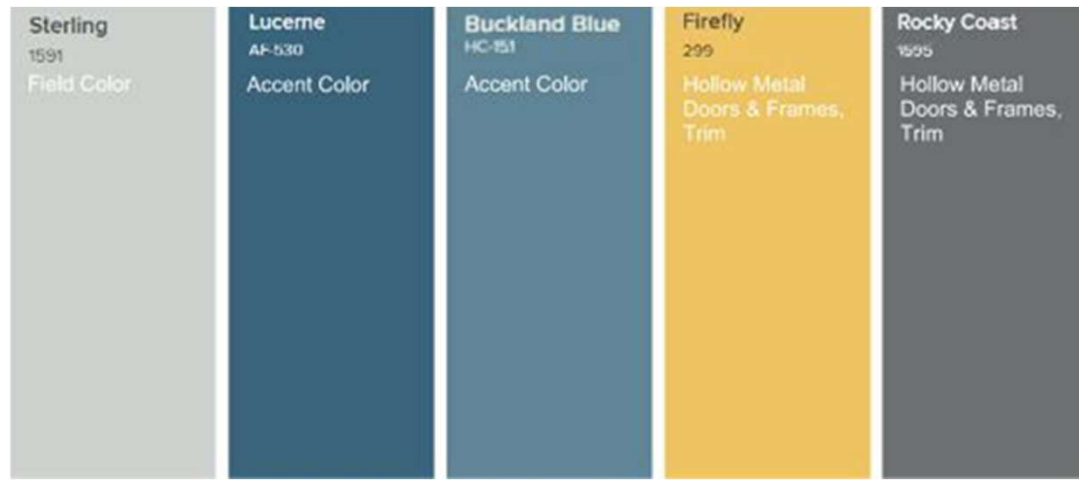


What could this look like?

Interior | Look + Feel



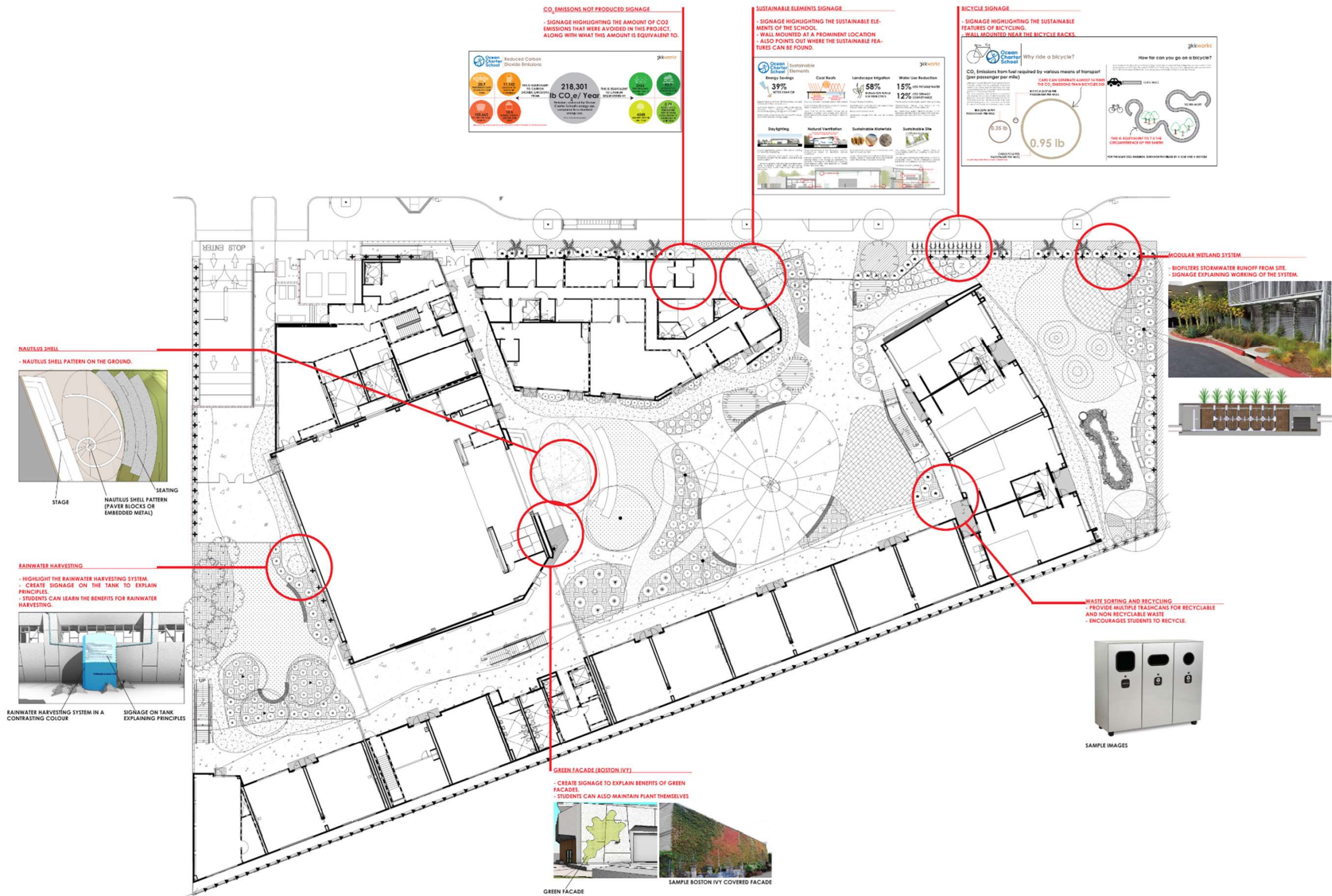
What could this look like?



Bowditch Middle School
Biophilia in Schools

- Restorative Benefits
- Enhanced Creativity
- Improves Cognitive Function and Productivity
- Increased Memory and Concentration
- Reduces Boredom, Stress, and Aggression

Education on Display - Educational Environment as a 3D Teaching Tool



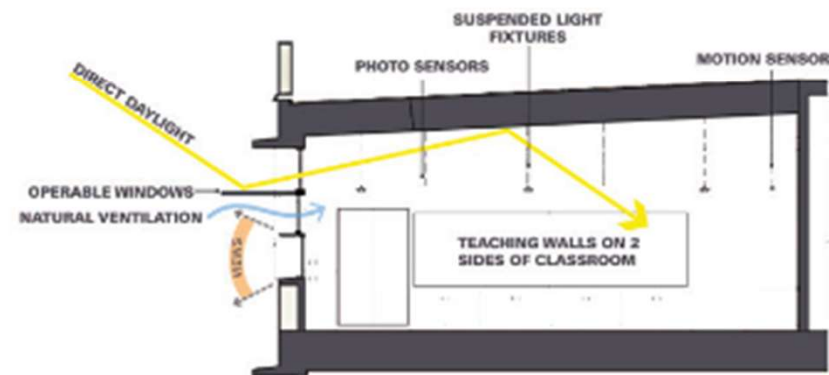
LAUSD- Charles Kim ES

- Designed as a high-performance school without client's initial buy-in
- Became 1 of 2 Demonstration Site for CHPS for LAUSD
- Prompted Formal Adoption of CHPS by LAUSD
- Compact Urban ES on less than 2 acres
- No additional fee or budget allocated

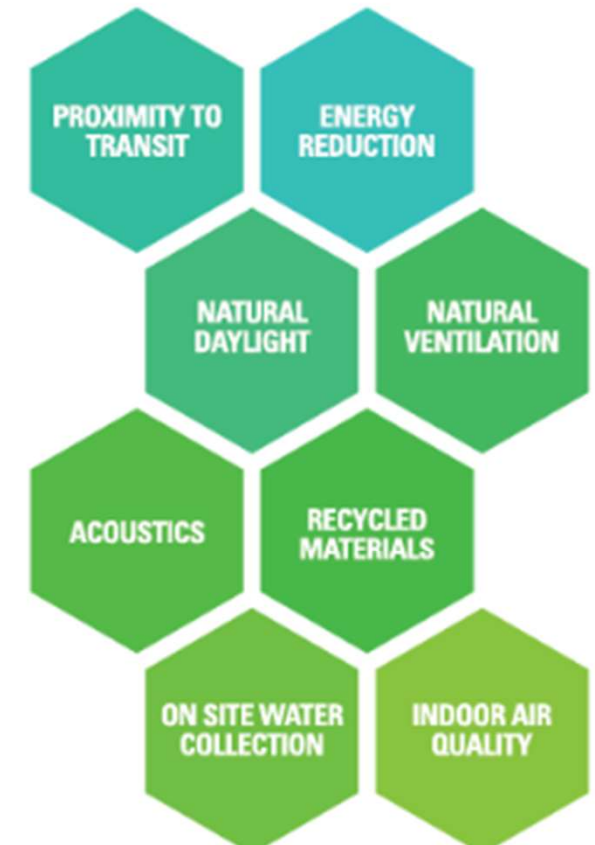


EUI (KBTU/SF-YR)

34.8 **30.4**
designed actual



Classroom showing sustainable design features



Sustainable strategies incorporated into school design

LAUSD- Irving STEAM MS

- NetZero & All-Electric



11 | EXTERIOR RENDERING - ENTRANCE FROM ESTARA AVE.
IRVING STEAM MAGNET MIDDLE SCHOOL MODERNIZATION PROJECT RFP: R24038



State Funding is positively addressing:

1. Learning Loss – Health and Wellness as a focus
2. Early Childhood Education
3. Nutritional Needs
4. Career Technical Education – Learning by Doing



High Performance Schools Improve Financial + Student-Centered Outcomes



Engagement

Belonging

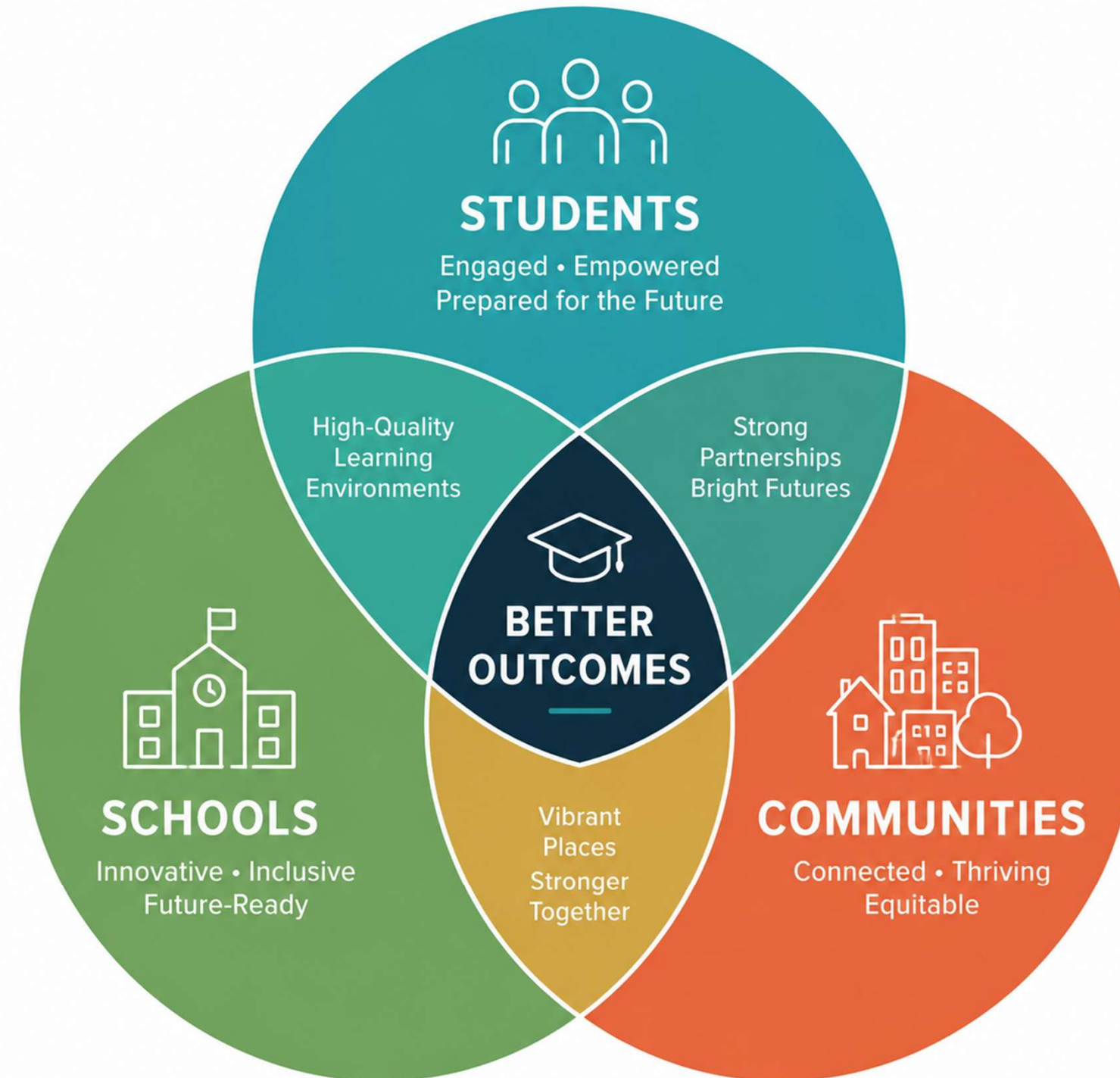
Wellness

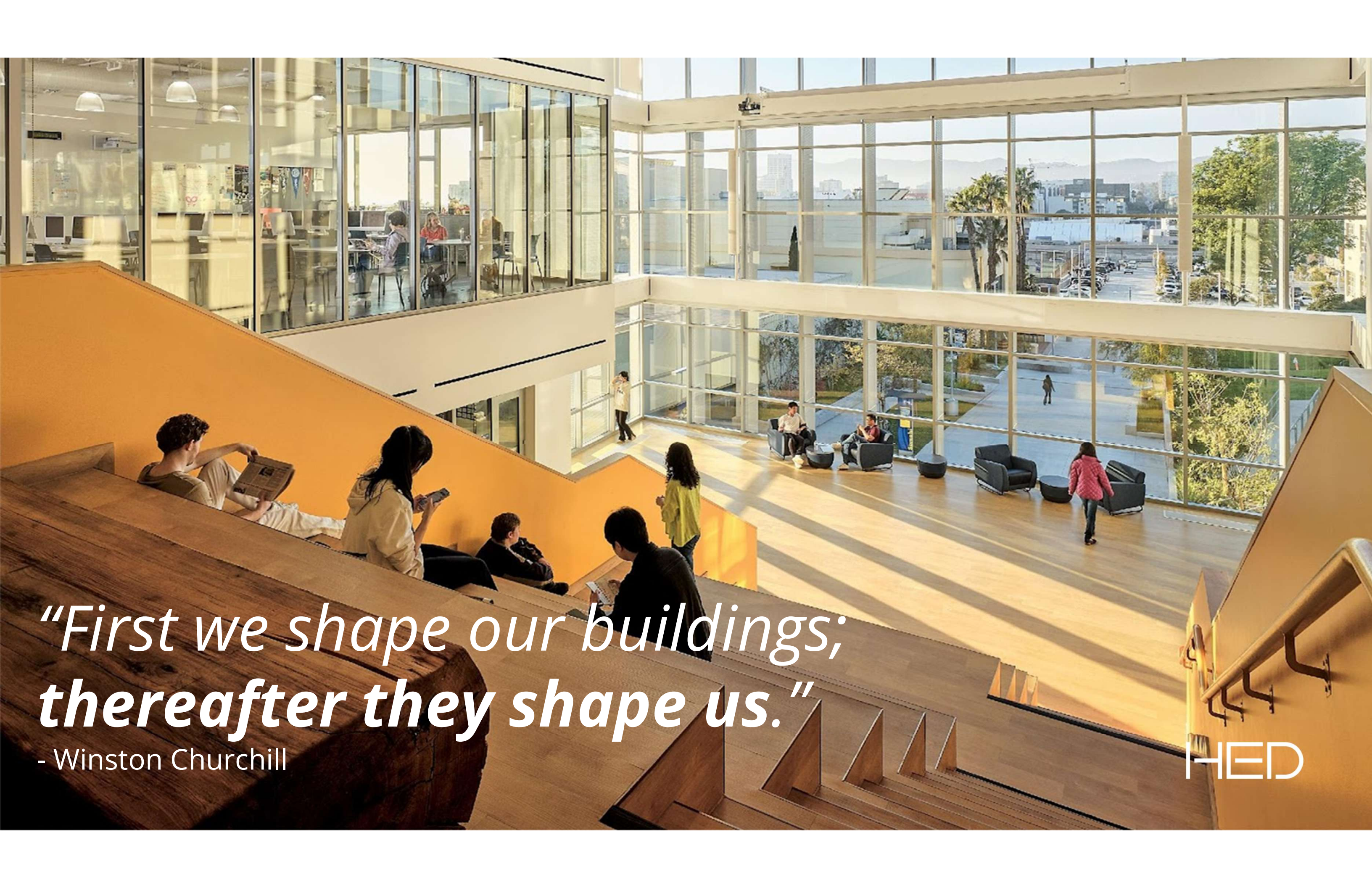
Flexibility

Community

In a high-performance school, the learning environment becomes more adaptable, equitable, and responsive to students.

Why are we here?





***"First we shape our buildings;
thereafter they shape us."***

- Winston Churchill

HED

Los Angeles Unified School District



02 Tools for Districts; Case Studies; Metrics of Success

Measurable Impact:

High Performance Schools at LAUSD

Christos Chrysiliou, FAIA, LEED AP
Chief Eco-Sustainability Officer

September 16th, 2026



International Studies LC
New Campus



Dahlia Heights ES
New Classroom Building



Agenda

- High Performance Schools at LAUSD
- High Performance Schools Impact Case Studies
 1. Jordan HS
 2. First Street Elementary
 3. Fremont HS
- Analysis of CHPS and LEED Rating Systems
- CHPS-to-LEED Transition



**Chief Eco-Sustainability Officer
Mr. Christos Chrysiliou**

Mission:

The Los Angeles Unified School District is committed to being the most sustainable and environmentally friendly large urban school district in the country



High Performance Schools at LAUSD

In 2003, the Board of Education adopted the Sustainability and the Design and Construction of High Performance Schools Resolution

SUBJECT: Sustainability and the Design and Construction of High Performance Schools (continued)

Resolved further, That the Board directs staff to continue its effort to ensure that every District new school and modernization project, from the beginning of the design process, incorporate CHPS criteria to the extent feasible; that the next round of new schools minimally meet the CHPS qualifying level (28 points) and preferably achieve at least 32 points; and that the focus be on criteria in the following priority areas:

- a. Student performance and staff health and well being, through measures such as daylighting, use of nontoxic-emitting materials, and sound insulation or isolation to minimize noise and enhance acoustical quality in the classroom;
- b. Operating cost minimization, through energy and water efficiency; and
- c. Minimizing the impact of District operations on the environment, through, for example, the installation or purchase of renewable energy resources such as solar power, and maximizing the beneficial use of stormwater runoff; and

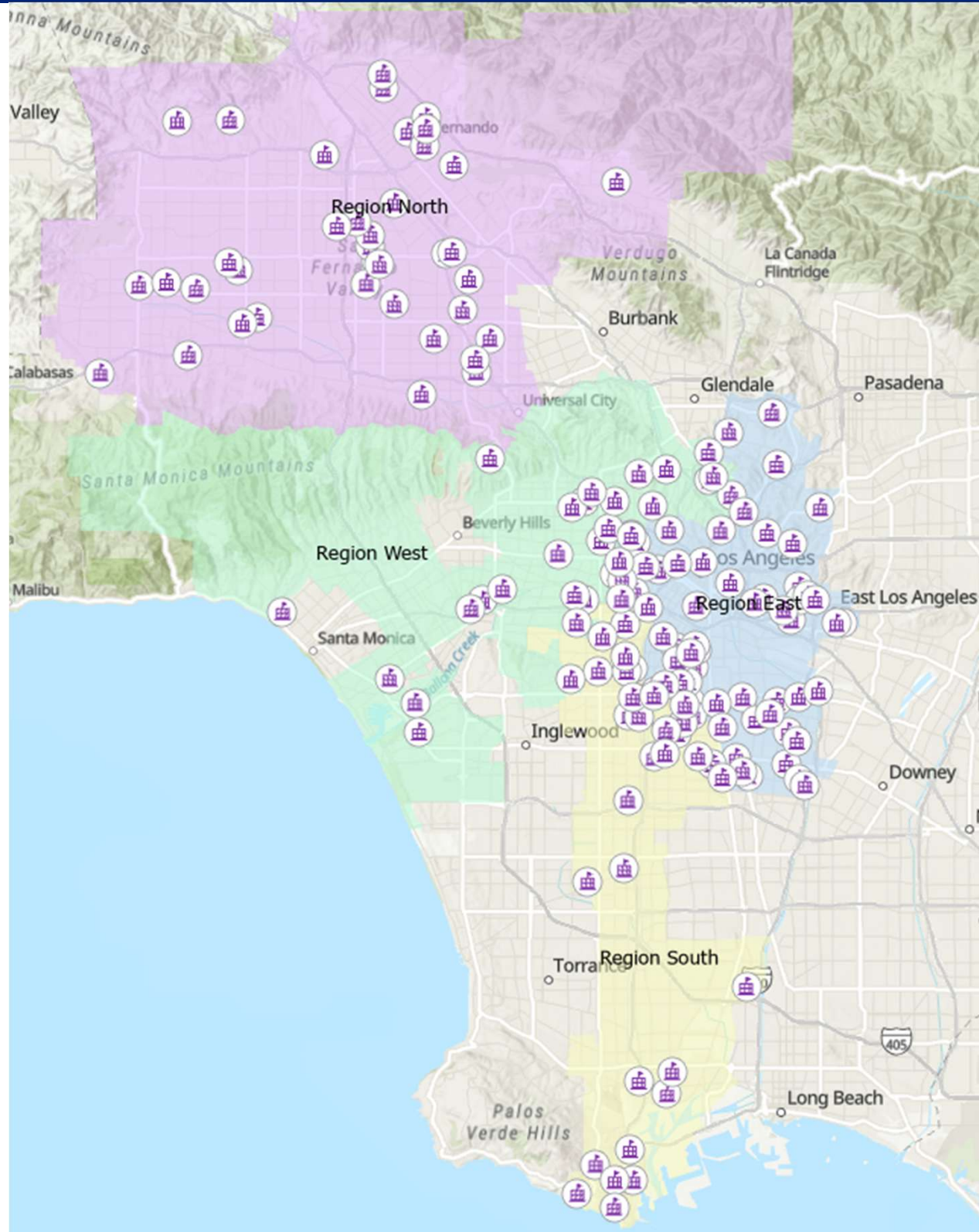
Purpose: Align District School Design Guidelines and Specifications with a green building certification program to protect student and staff health, minimize the District's environmental impacts, and reduce utility costs.

23 Years of High-Performance Schools at LAUSD

Transitioning to LEED: As of June 30, 2027, CHPS will officially sunset and become part of LEED v5.0. Understanding what this means for LAUSD is currently being studied by the District and its partners.



High Performance Schools Impact at LAUSD



CHPS at LAUSD

- **23 years** since CHPS was adopted by LAUSD
- **148** CHPS projects completed
- **124** CHPS Designed projects (2003 – 2018)
- **24** CHPS Verified projects (2018 – 2026)
- **54** Active CHPS projects
- **15.7 million square feet** of certified new construction and major/comprehensive modernizations

LEED at LAUSD

- **7** LEED projects completed
 - **1** LEED Platinum
 - **5** LEED Gold
 - **1** LEED Silver
- **1.22 million square feet** of LEED-certified buildings



High Performance Schools Impact at LAUSD

High Performance Schools 2018–2026

Total Avoided Energy Consumption:

16,825,015 kWh = \$4.6M (2026 \$)

Total Avoided Natural Gas Consumption:

985,056 Therms = \$1.7M (2026 \$)

Total Avoided Greenhouse Gas Emissions:

14,972 MTCO₂e

Equivalent to:

Taking **3,492 personal vehicles** off the road

Enough to power **2,011 homes** for a year

5,290 tons of waste diverted from landfills

15,018 acres of forestland, or roughly 3.25 Griffith Parks of forestland



Theodore Roosevelt HS



High Performance Schools Impact at LAUSD

High Performance Schools

1. Efficient Environmental Performance

- 5% better energy performance than Title 24 minimums
- 20% reduction in District water use since 2018
- Phasing out gas-fired equipment
- Stormwater capture and treatment

2. Better Student Health Outcomes

- Healthy building materials and finishes
- Indoor and Outdoor Air Quality Networks
- Lower ambient air temperatures through increased cool material/coatings use
- Better student attendance

3. Improved Academic Achievement

- Innovative & Connected Classrooms
- Improved teaching environments
- Integrated sustainability curriculum

148 High Performance Schools



Venice HS



Shenandoah ES



Cleveland HS



Wonderland ES



Crenshaw HS



Belvedere MS



CHPS/LEED Projects Over the Years



Maywood CES



Amestoy ES



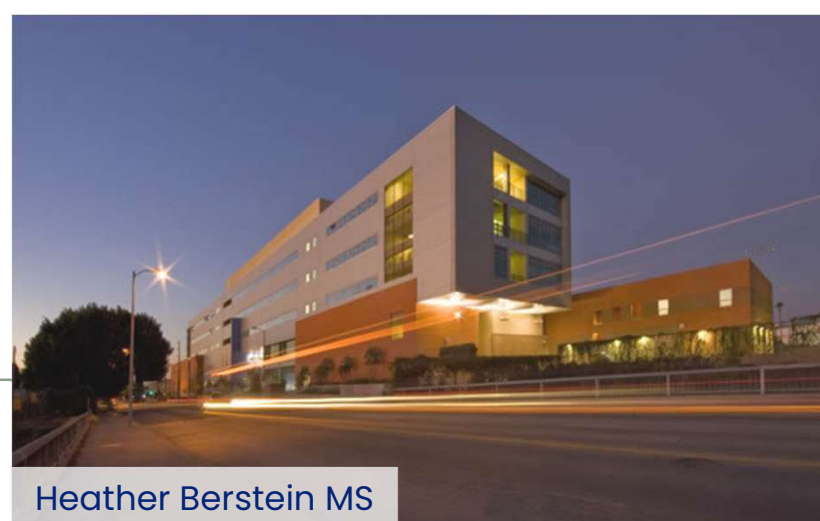
Roybal HS



RFK Community Schools



Playa Vista ES



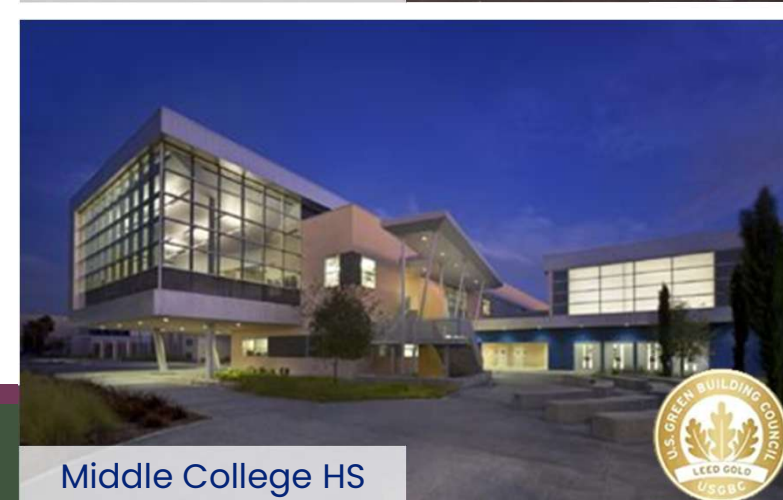
Heather Berstein MS



Charles Kim ES



Olive Vista MS



Middle College HS



Sotomayor LA



Jordan HS



Michelle Obama ES



CHPS/LEED Design & Construction Partners



Practice



LIONAKIS

JF()AK



NAC



Hensel Phelps
Construction Co.



BERLINER
ARCHITECTS

Thank You!



AC MARTIN

CANNONDESIGN

CO ARCHITECTS



tsk
ARCHITECTS

KEMP BROS
CONSTRUCTION

kdA

PBWS
Architects



DLR Group

PANKOW
BUILDERS

VG Verdical Group

HED

NADEL

HMC
Architects
DESIGN
FOR
GOOD

JOHNSON
FAVARO



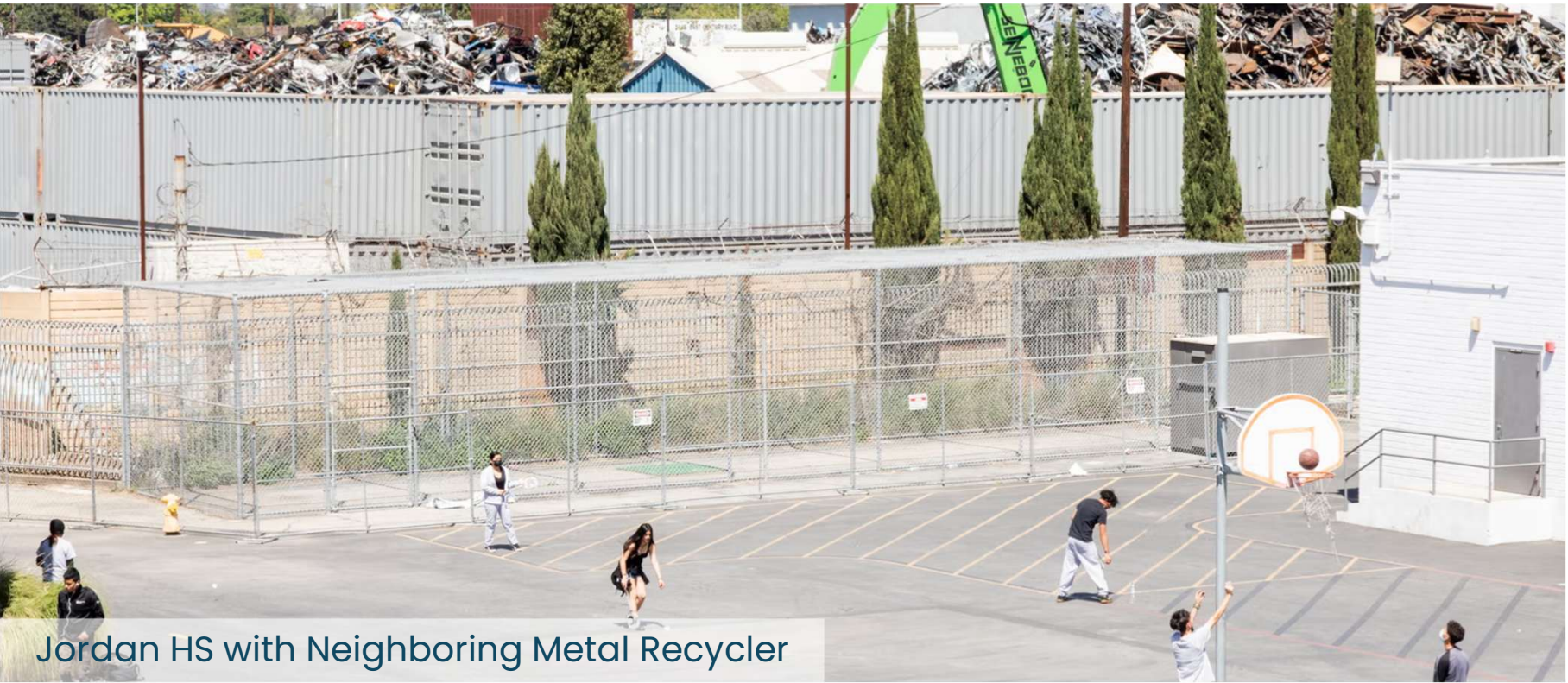
MORRISSEY
ARCHITECTS | DESIGN | DEVELOPMENT



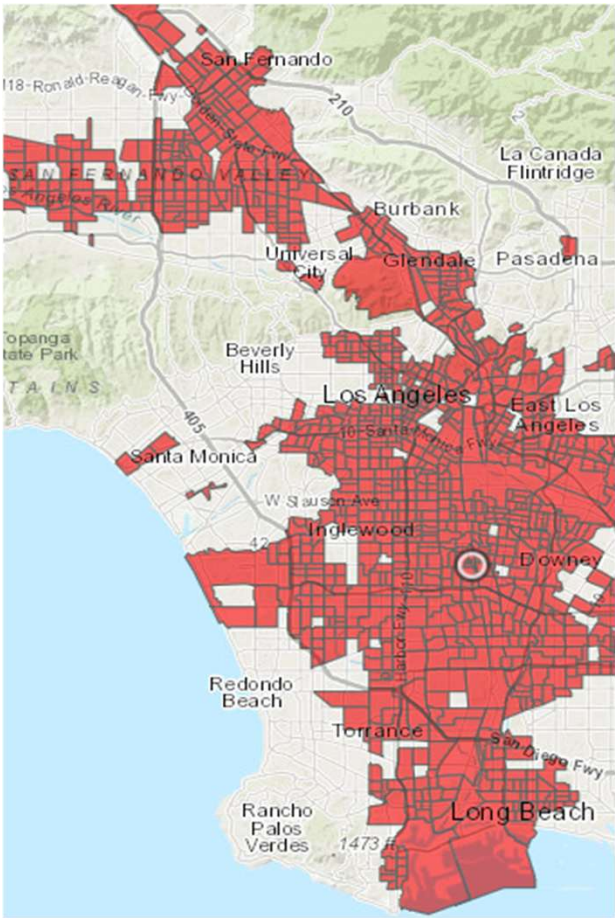
CHPS Impact at LAUSD – Case Study #1

Background on Jordan HS

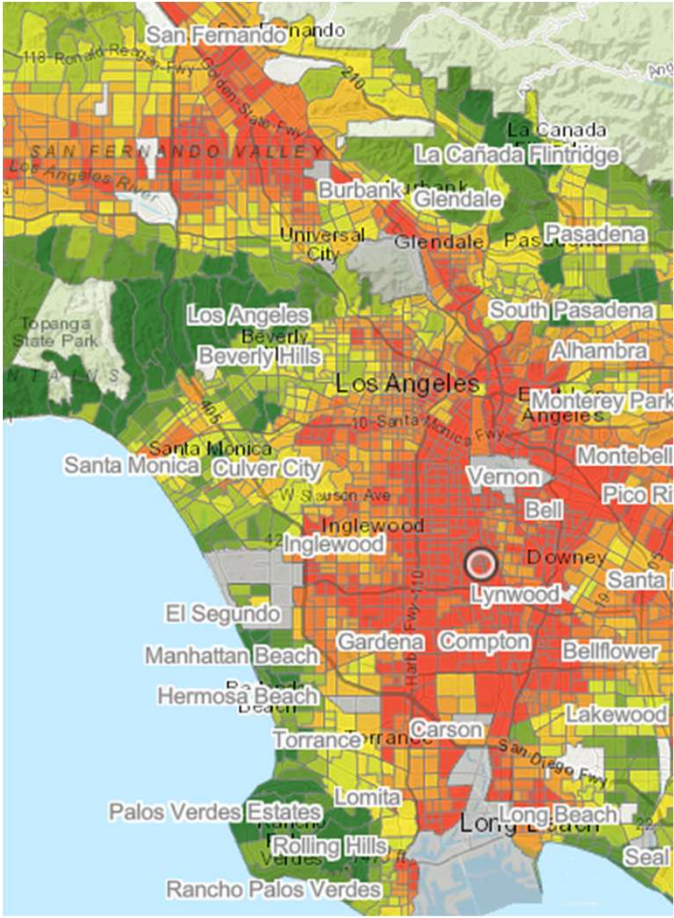
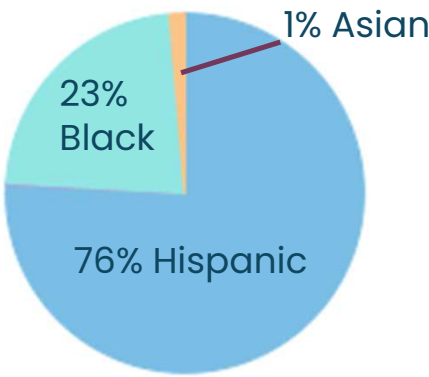
- Constructed in 1920, an industrial corridor developed along Alameda Avenue around the school
- Property abuts a local metal recycling plant, which negatively impacts air quality
- As a result, the surrounding Watts neighborhood has experienced high asthma rates
- 99% of students are non-white
- 98% qualify for free or reduced lunch



Jordan HS with Neighboring Metal Recycler



Race / Ethnicity Profile



CalEnviroScreen Analysis

Overall Percentiles	
CalEnviroScreen 4.0 Percentile	99
Pollution Burden Percentile	93
Population Characteristics Percentile	98
Sensitive Populations	
Asthma	94
Low Birth Weight	59
Cardiovascular Disease	98



CHPS Impact at LAUSD – Case Study #1 (cont.)

High Performance Project at Jordan HS

- Renovations of two main classroom buildings, construction of two new three-story classroom buildings, and administration building renovation
- Site-wide improvements to garden and electrical infrastructure

High Performance Features

- Achieved majority of CHPS and LEED points for reducing water use for landscaping by installing a native garden and an efficient irrigation system
- Installed cool roofs to mitigate the urban heat island effect and reduce use of cooling system
- Minimized construction waste by reusing 94% of the existing structural elements



Designed by:



Certified by:





CHPS Impact at LAUSD – Case Study #1 (cont.)

Impacts at Jordan HS Since Construction Finished in 2016

Environmental Performance:

69% reduction in annual water use, or ~\$80,000 in annual water utility savings

Academic Performance:

24% increase in students meeting state English testing standards

Student Health Outcomes:

The Jordan HS campus reached 39% green space, providing a large natural area in an urban core



Classroom Modernization



Jordan HS Native Garden



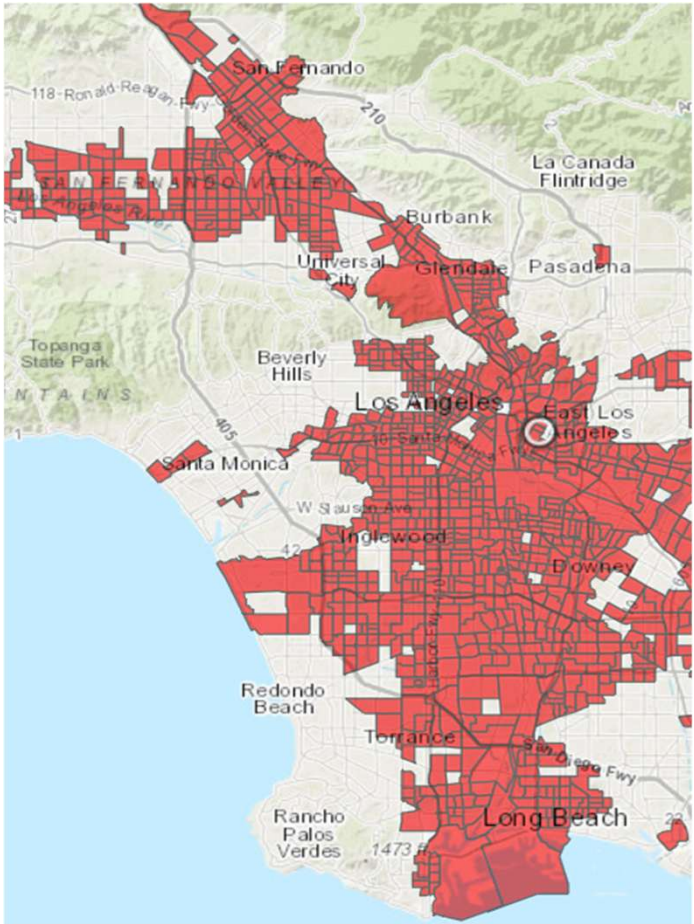
CHPS Impact at LAUSD – Case Study #2

Background on 1st Street Elementary School

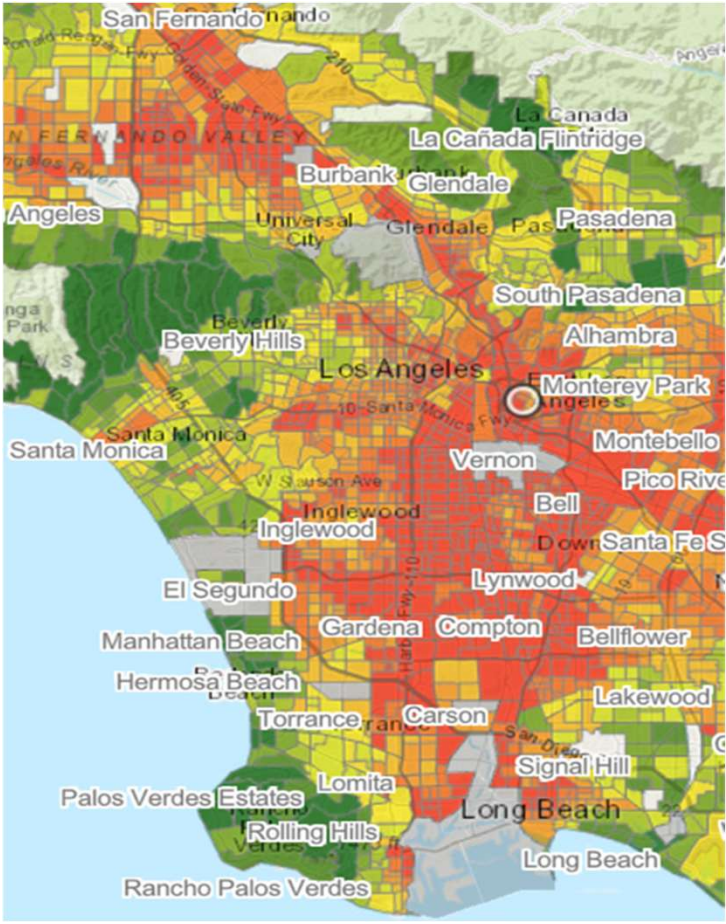
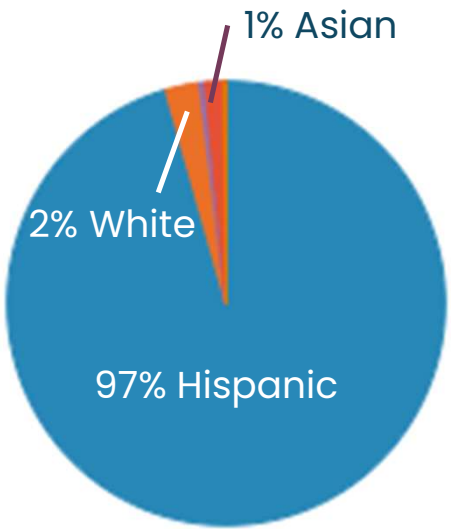
- Constructed after the 1933 Long Beach earthquake
- Operated as an assimilation center for immigrant families, providing lessons in English and on American culture
- In 2014 the East Building was determined to be eligible for national, state, and city historic registers
- 97% non-white student body
- 98% qualify for free or reduced lunch



First Street Main Entrance



Race / Ethnicity Profile



CalEnviroScreen Analysis

Overall Percentiles	
CalEnviroScreen 4.0 Percentile	94
Pollution Burden Percentile	85
Population Characteristics Percentile	92
Sensitive Populations	
Asthma	66
Low Birth Weight	88
Cardiovascular Disease	52



CHPS Impact at LAUSD – Case Study #2 (cont.)

High Performance Project

- Seismic retrofit of an existing 2-story classroom building
- Modernizing 10 classrooms and food service building
- Construction of a new lunch pavilion

High Performance Features

- Cool roofs to mitigate the local urban heat island effect and reduce reliance on cooling systems
- Superior energy efficient design, targeting a 22% increase in performance over Title-24
- Received full points from CHPS in the recycled materials, certified wood, and low-emitting building material categories



Designed by:



Certified by:



Site Plan:





CHPS Impact at LAUSD – Case Study #2 (cont.)

Impacts at First Street Elementary Since Construction Finished in 2018

Environmental Performance:

22% Reduction in Energy Use
or ~\$23,000 in avoided costs
annually

Academic Achievement:

80% increase in Students
Meeting State English
Standards

Student Health Outcomes:

Finishes and furnishings were
carefully selected to contain no
VOCs, protecting lung health





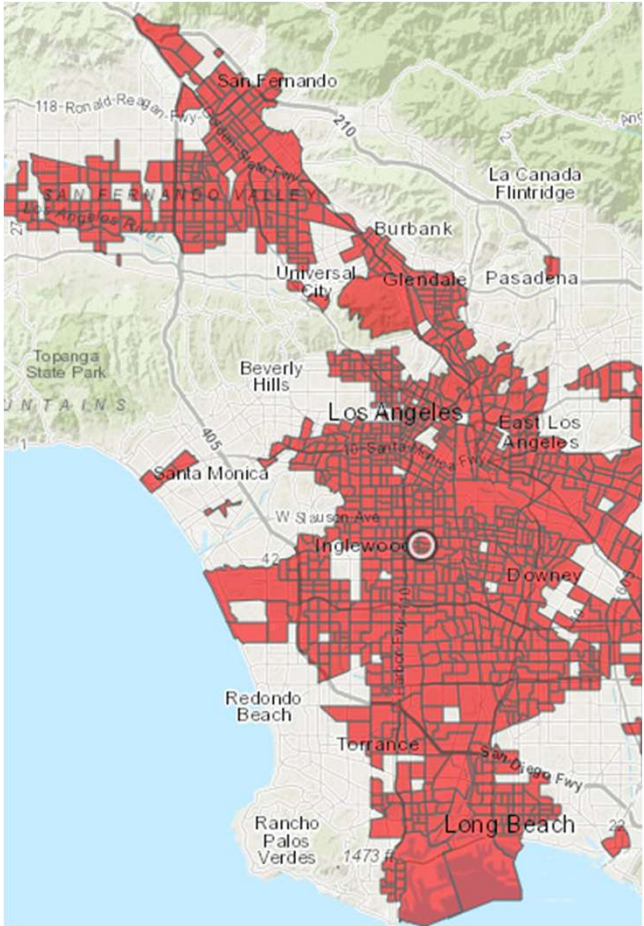
CHPS Impact at LAUSD – Case Study #3

Background on John C. Fremont High School

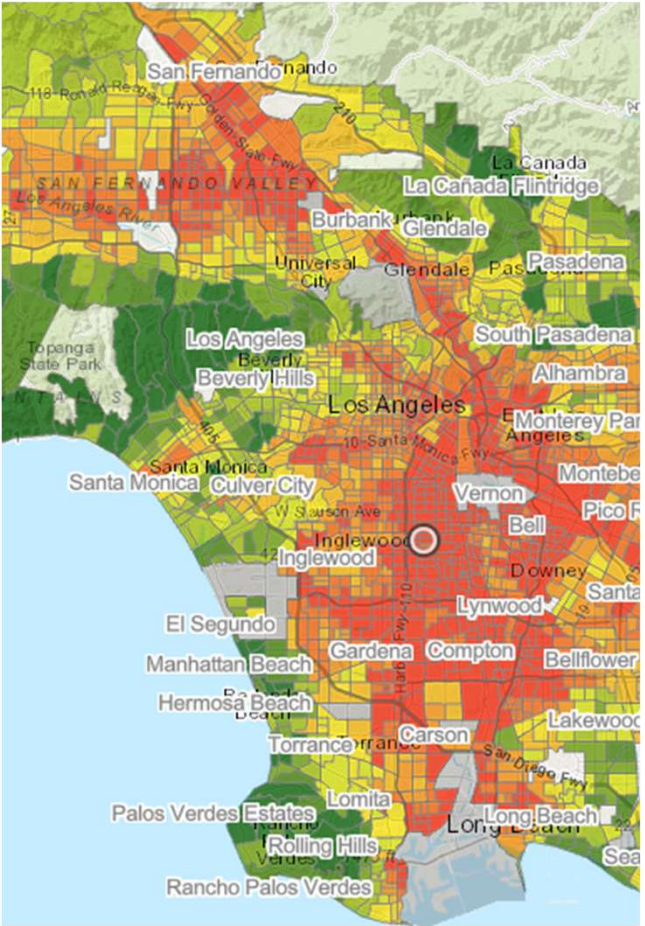
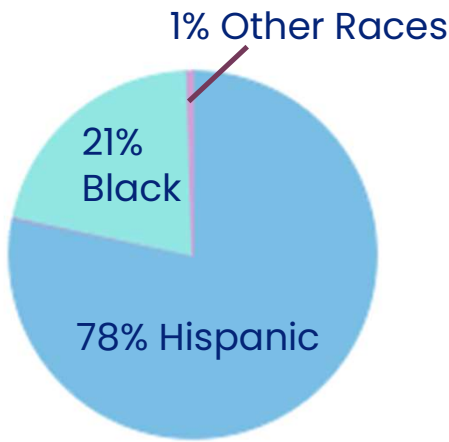
- 99% non-white student body
- 98% qualify for free or reduced lunch
- Historical High School built in 1924, with Global Media Arts, Law & Social Justice, Medical Science, and STEAM programs.



New Main Entrance at Fremont HS



Race / Ethnicity Profile



CalEnviroScreen Analysis

Overall Percentiles	
CalEnviroScreen 4.0 Percentile	93
Pollution Burden Percentile	82
Population Characteristics Percentile	92
Sensitive Populations	
Asthma	88
Low Birth Weight	37
Cardiovascular Disease	98



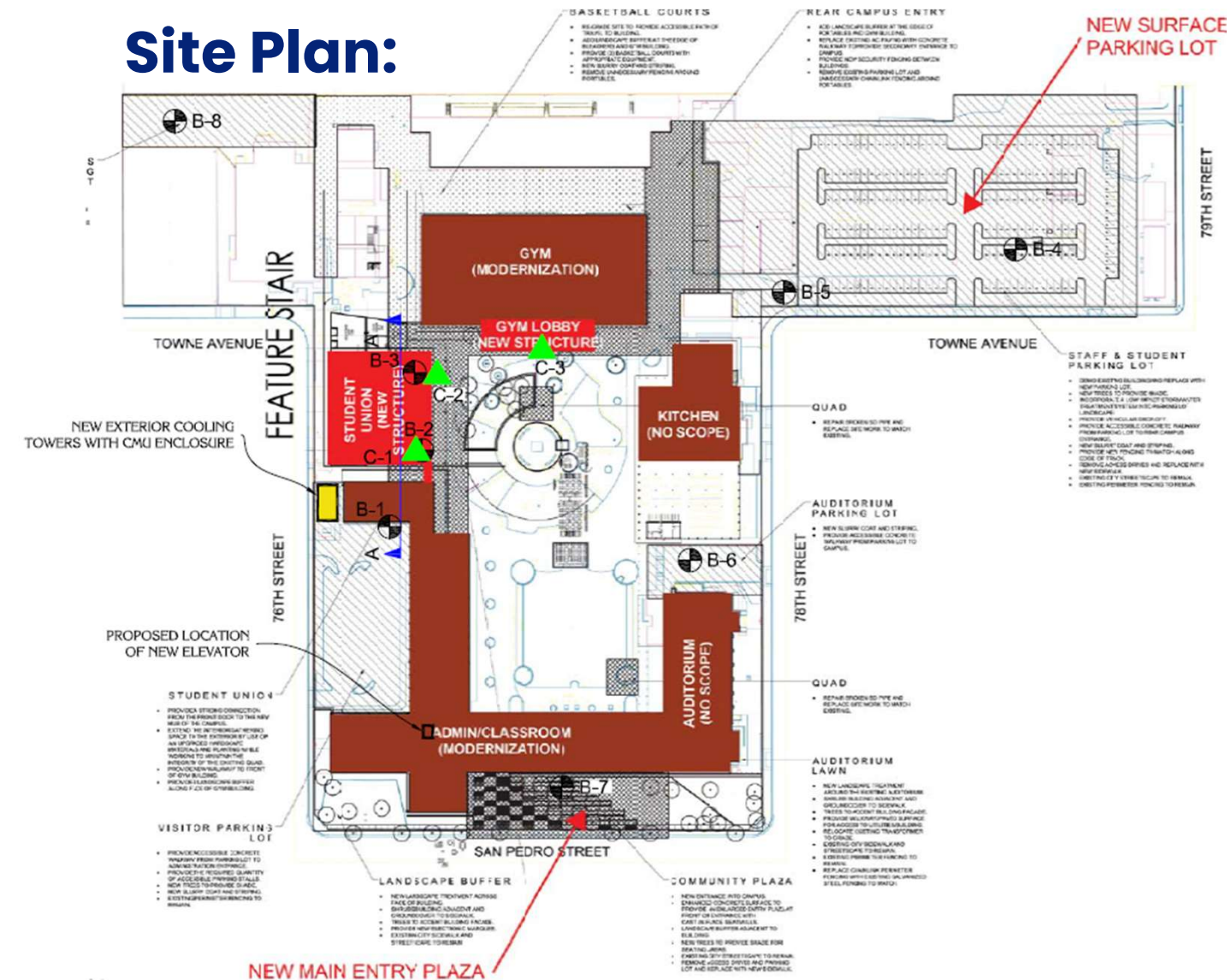
CHPS Impact at LAUSD – Case Study #3 (cont.)

High Performance Project at Fremont HS

- Modernization of the main three-story classroom building
- Modernization of the existing Gymnasium
- Construction of a new two-story student union and library building

High Performance Features

- A 35% performance above Title-24 was targeted through the installation of:
 1. Highly efficient condensing hot water boilers
 2. Water-cooled magnetic bearing chillers
 3. Radiant heating
 4. Strategic use of shading
- Received full points in View and Electric Lighting CHPS categories, ensuring classrooms received ample natural and artificial light



Designed by:



Certified by:





CHPS Impact at LAUSD – Case Study #3 (cont.)

Impacts at John C. Fremont HS Since Construction Finished in 2016

- Received CASH/AIACC Leroy F. Greene Honor Award & Design Honor Award for Modernization / Transformation

Environmental Performance:

10% Reduction in Electricity Use, or
~\$32,000 in avoided electricity costs
annually

Academic Achievement:

14% increase in students meeting state
English testing standards

Student Health Outcomes:

+90% of spaces have access to views,
increasing attention and alertness
amongst students





Adapting to LEED v5.0

LAUSD's Study of Adopting LEED v5.0

In anticipation of the CHPS program ending in June 2027, the Eco-Sustainability Office (ESO) partnered with LAUSD's Facilities Services Division, Maintenance & Operations, and Standards to complete a study into the impacts of replacing CHPS with LEED v5.0 as the District's design and construction standard.

Study Objectives:

1. Determine potential added costs or savings from switching to LEED by completing a full cost-benefit analysis of:
 - i. CHPS v2.0 + 2025 CALGreen Code
 - vs.
 - ii. LEED v5.0 + 2025 CALGreen Code
2. Investigate the difference in fees between CHPS and LEED
3. Highlight where LAUSD Technical Specifications and Design Guidelines would need to be updated to comply with LEED prerequisites

Study Structure:

1. Review two Case Studies of existing CHPS projects:
 - ii. Shenandoah Elementary Classroom Replacement Project
 - iii. Lincoln High School New Classroom Project
2. Bring both projects up to CHPS v2.0 standards and comply with the 2025 CALGreen code
3. Show differences in costs of achieving LEED Certified, LEED Silver, and LEED Gold



James Monroe HS



CHPS v2.0 – LEED v5.0 Study

LAUSD's LEED v5.0 Study Conclusions

110

Overall LEED
Points

84

CHPS-Aligned
Points

26

LEED Only
Points

Cost Impacts:

Both the Shenandoah and Lincoln case studies were able to achieve LEED-Silver certification at minimal cost

Cost Drivers:

Fundamental Commissioning under LEED requires Ongoing Cx Plans, which LAUSD does not currently require

Next Steps:

1. LAUSD BOE must ratify any change to the Design and Construction Standards
2. Technical Specifications and Design Guidelines must be updated to comply with LEED





Thank You



The Division of the State Architect



03

**Where We've Been
Where We Are
Where do we go from Here**

California Leads the Way

EXECUTIVE ORDERS BY BROWN ADMINISTRATION



B-16-12

Set goal of 1 million ZEVs by 2020



B-30-15

Greenhouse gas emissions 40% less than
1990 levels by 2030

AB 32 (2006) 1990 levels by 2020

B-55-18

Achieve statewide carbon neutrality by 2045

AB 1279 (2022) 85% below the 1990 levels



7,745,721

U.S. EV Sales



2,702,646

CA EV Sales



216,455

CA EV Chargers



68

CA Hydrogen Stations



137

CA Light-Duty Models
Available



1,507

CA Medium/Heavy-
Duty EV Trucks



2,555

CA EV Buses



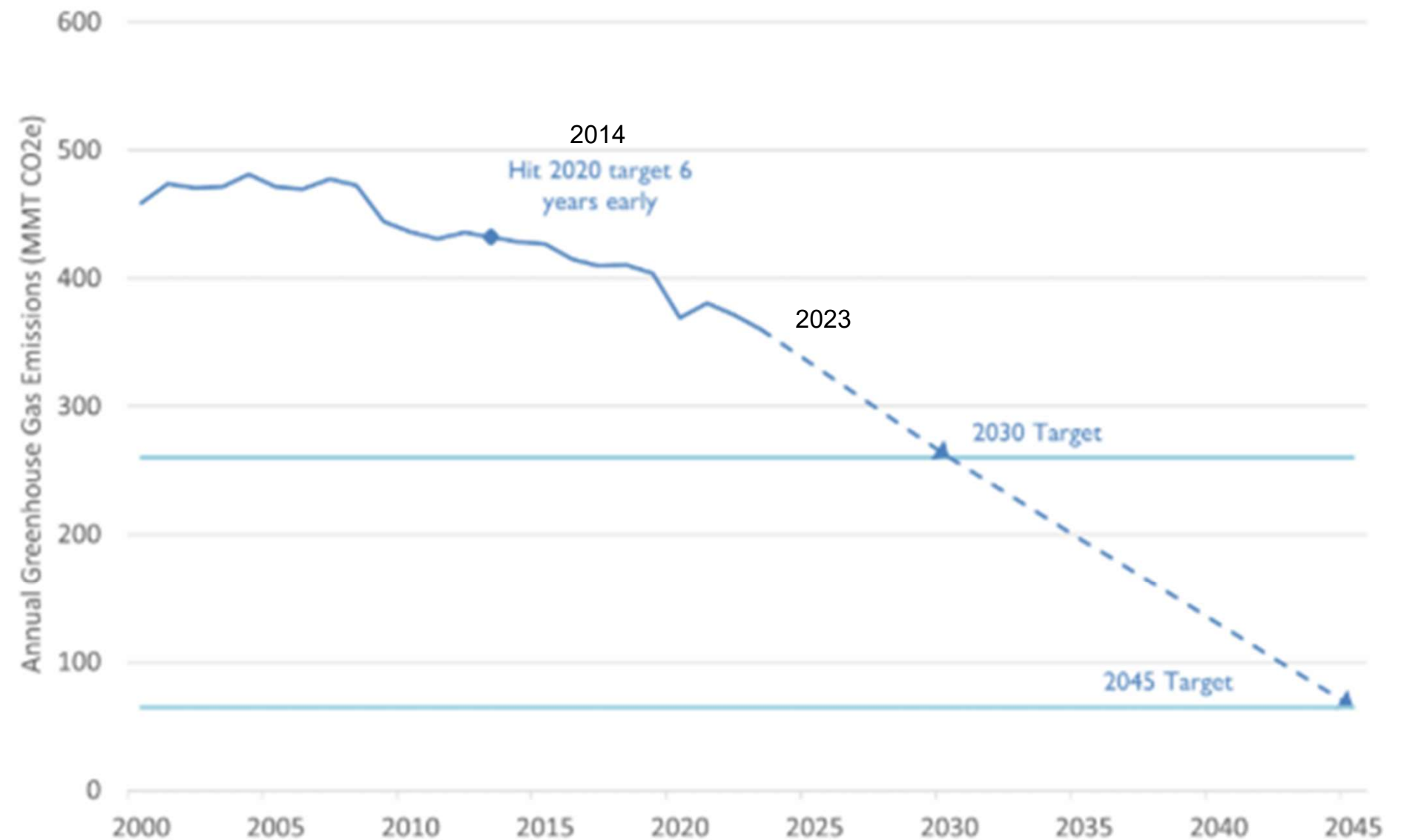
1,795

CA EV Delivery Vans

CALIFORNIA LEADS THE WAY

1990 Levels: 431 MMT CO₂e
2004 Levels: 492 MMT CO₂e (Highest Recorded)
2023 Levels: 360 MMT CO₂e (Equal to taking 26.2M cars off the road for 1 year)

Estimating 48% of 1990 levels by 2030.



AB 1279 (2022) Target:
85% below 1990 levels in 2045 and achieve carbon neutrality (the remaining 15% of emissions in 2045 will be addressed through carbon dioxide removal).

CALIFORNIA LEADS THE WAY



GOVERNOR NEWSOM'S EXECUTIVE ORDERS

N-19-19

Requires every aspect of state government to redouble its efforts to reduce greenhouse gas emissions and mitigate the impacts of climate change while building a sustainable, inclusive economy.

N-79-20

Sets a goal that 100 percent of in-state sales of new passenger cars and trucks will be zero-emission by 2035.



Benefits of climate action in California



Carbon-free electric
grid

On Track



52%

Decrease in greenhouse gas emissions from electric
power from 2008 - 2023

On Track



2,213,296

Zero-emission vehicle sales through 2024

On track



\$100 billion

In consumer savings from energy efficiency standards

Learn More



\$200 billion

Value of avoided health impacts in 2045

Learn More



544,604

Clean energy jobs in California in 2023

Learn More



Effects of Climate Change to Schools

Fire



Photo by [Nikolay Maslov](#) on [Unsplash](#)

Extreme Heat



Photo by [Jess Zoerb](#) on [Unsplash](#)

Drought

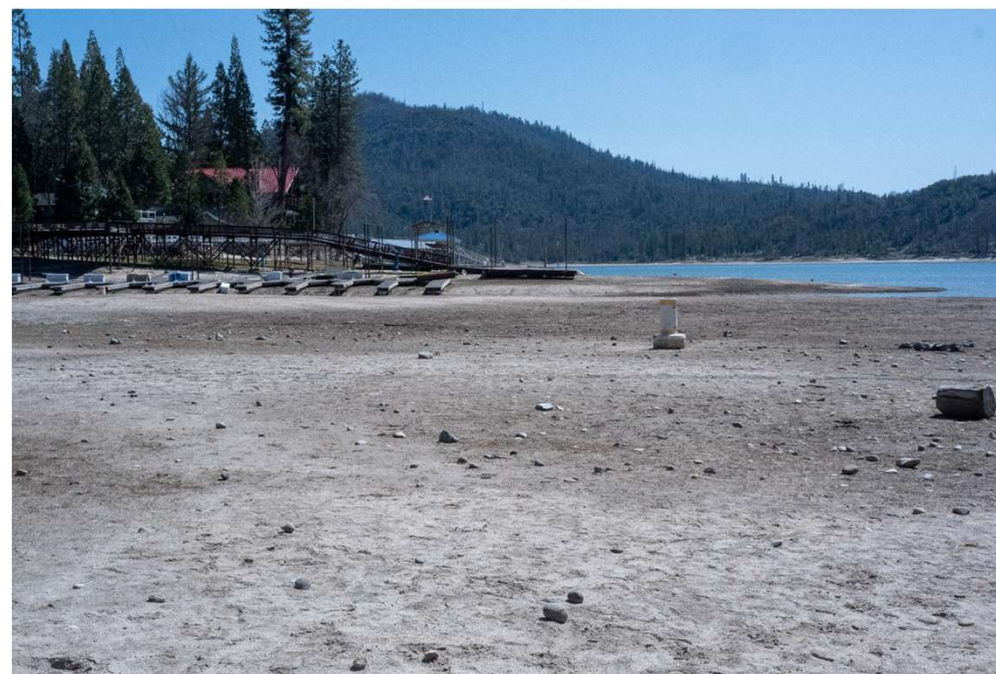


Photo by [Chanelle](#) on [Unsplash](#)

Flood



Photo by [Mika Baumeister](#) on [Unsplash](#)

CALIFORNIA

H E A T A S S E S S M E N T T O O L

California is facing a warmer climate over the next century. More frequent and severe heat events will pose considerable health risks that disproportionately impact frontline populations. This tool allows users to explore and understand how extreme heat will impact specific communities across the state.

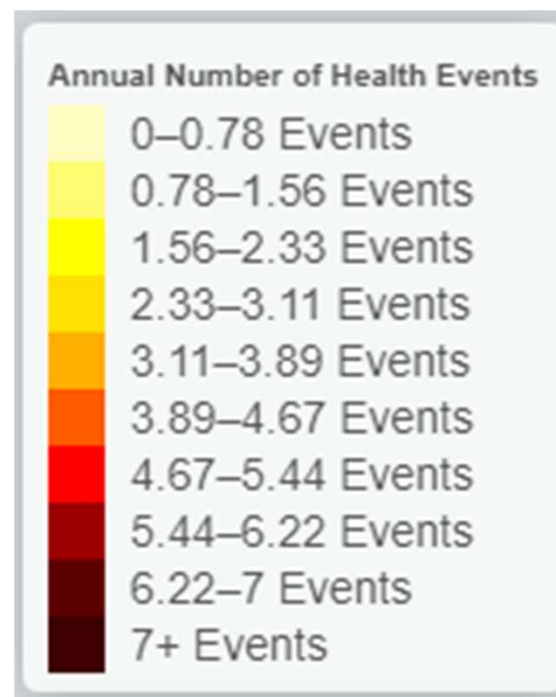
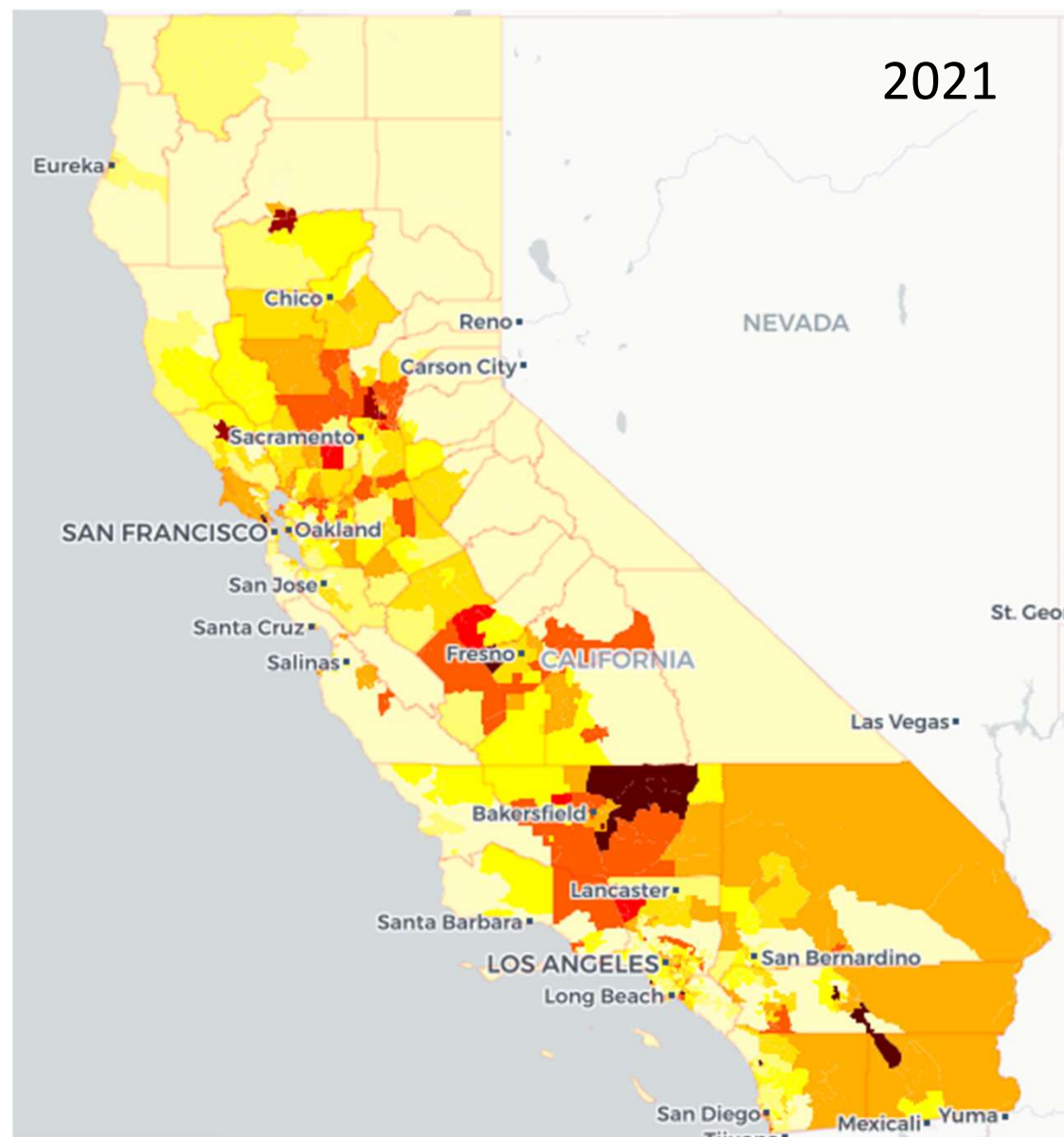


Explore California by City or County

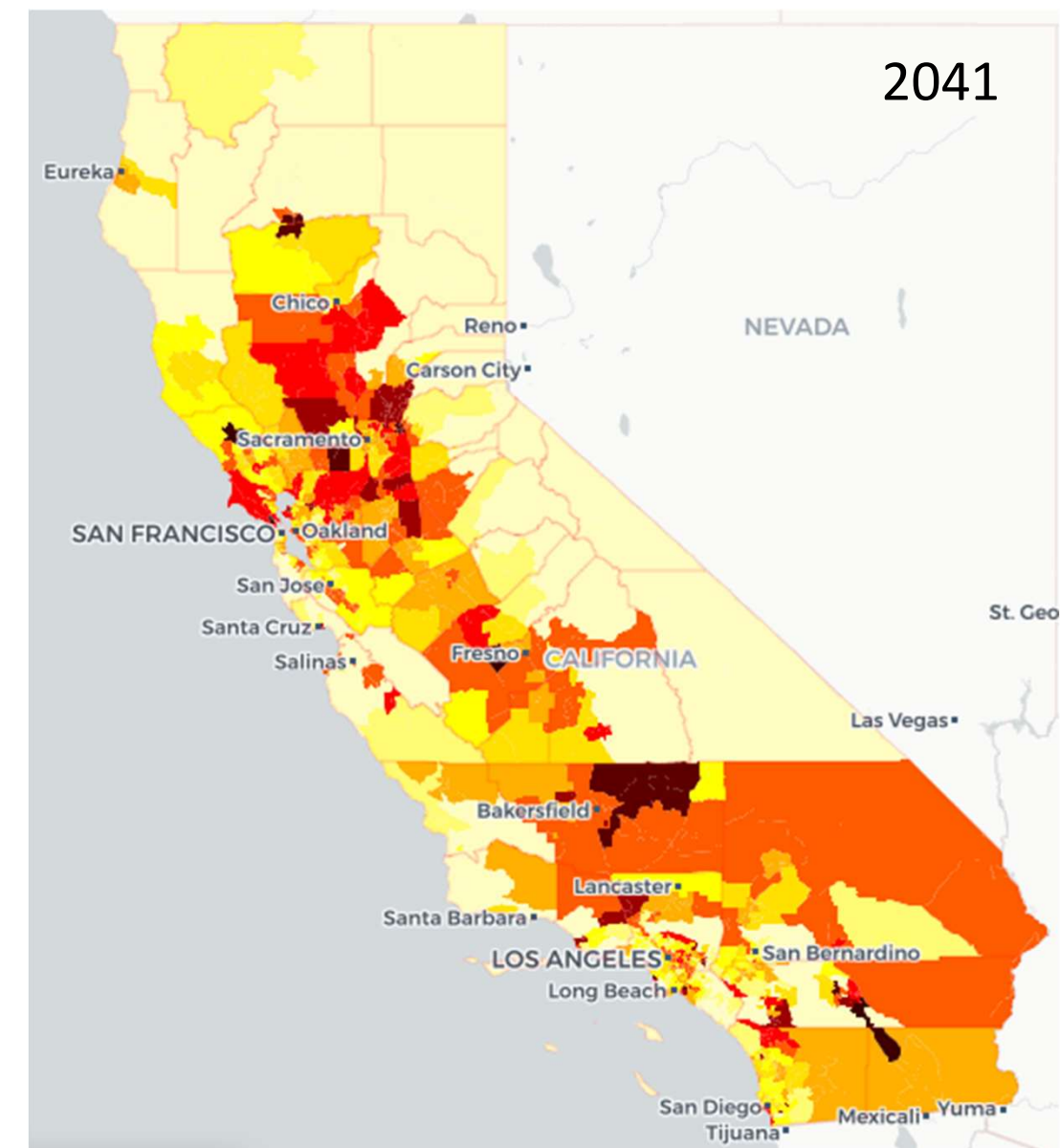


GO

The California Heat Assessment Tool was funded by the California Natural Resources Agency for local and state health practitioners to better understand dimensions of heat vulnerability driven by climate changes and where action can be taken to mitigate the public health impacts of extreme heat in the future.



A heat health event is any heat event that results in negative public health impacts, regardless of the absolute temperature.



Heat Health Events

HOME » DIVISION OF THE STATE ARCHITECT » RESOURCES » SUSTAINABLE SCHOOL FACILITIES

Sustainable School Facilities

Learn how schools can incorporate sustainability measures and achieve net zero energy and net zero carbon school facilities.



LEGISLATION & EXECUTIVE ORDERS



GETTING TO ZERO OVER TIME COHORT



TRAINING



CALIFORNIA SUSTAINABLE SCHOOLS SHOWCASE



SUSTAINABLE SCHOOLS & RESILIENCY RESOURCES



GRANTS & FUNDING RESOURCES



WATER CONSERVATION RESOURCES



Increase school facility energy efficiency and reduce greenhouse gas emissions with each new construction and modernization, leading to a zero net energy and zero net carbon future.



DSA

Accomplishes large water savings by choosing climate adapted plants, improving soil conditions, using, and maintaining high efficiency irrigation equipment and managing the irrigation schedule to fit the plants water needs as they are influenced by local climate.

2016 CALGreen: Model Water Efficient Landscape Ordinance (MWELO)

Requires Shade
Trees to provide
shade to:

50% of parking
areas
within 15 years

20% of landscape
areas within 15
years

20% of hardscape
areas within 15
years



Photo by [Ryan Jacobson](#) on [Unsplash](#)

2019 CALGreen: Shade Trees

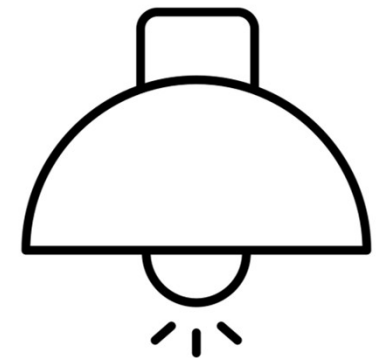


2019 Energy Code and CalGreen



Acceptance Testing Requirements for Lighting and HVAC systems:

- Ensures that the installed equipment is operating as designed and in compliance with the Energy Code.
- Requires certified Acceptance Testing Technicians (ATTs) to be used for
 - ✓ Indoor and Outdoor Lighting and Controls
 - ✓ HVAC Systems and Controls



Created by Made from the Noun Project



Created by Ranah Pixel S

CO2 Monitors in new K-12 classrooms



Reduce Emissions through Electrification

Advance Resiliency & Equity



2022 Energy Code

- Heat Pump Technology
- Solar PV
- Battery Storage



Photo by [myenergi](#) on [Unsplash](#)

2022 CALGreen:

EV Charging

- 20% EV capable spaces (infrastructure)
- 25% of EV capable spaces provided with a charger



Mandatory Measures

50,000 sf and greater for K-12 schools and community colleges

BUILDING REUSE

Reuse existing building, maintain 45% of the existing structure and enclosure.

WBLCA

Performance Path- Conduct a cradle-to-grave whole building life cycle assessment demonstrating at 10% reduction in global warming potential (GWP).

PRESCRIPTIVE PATH

Comply with product GWP limits established in the BCCA. Based on 175% of IW-EDP GWP values (weighted average alternate available for concrete).

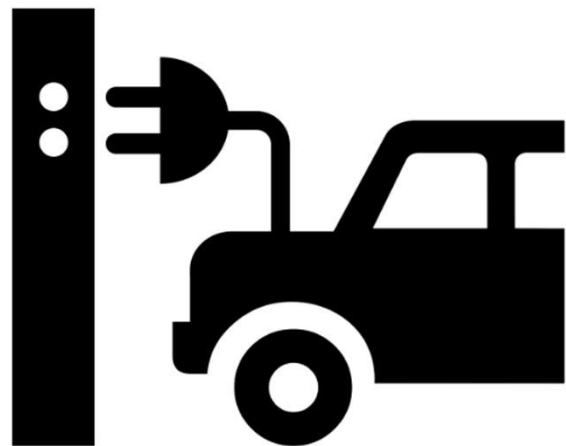
2022 Intervening Code Cycle Carbon Reduction Regulations

2022 INTERVENING CODE CYCLE: CALGREEN

EV Charging: Charging Power Alternative and Existing Facilities

New parking facilities:

Requires Level 1, Low Power Level 2 or Level 2, or any combination thereof, providing a minimum total power based on number of parking spaces in a facility.



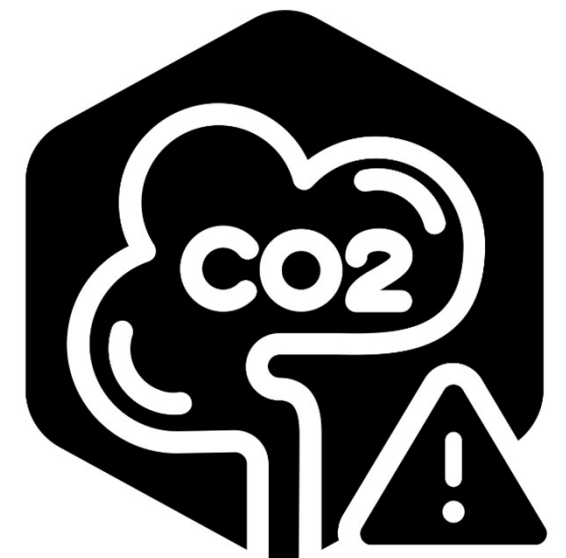
For existing facilities:

Required if installing new light fixtures in existing parking, adding to parking facilities, or installing solar PVs over parking. Requires chargers to be installed in EV capable spaces when a project is submitted to DSA.

Created by Luis Prado
from Noun Project

CO2 Monitoring: Existing Facilities

Requires CO2 monitors in existing K-12 classrooms when a building is modernized.



2025 CALGREEN:

Requires CO2 monitors in all classrooms and similar rooms including Community Colleges.





Mandatory Measures for Schools

- Bicycle parking
- Electric vehicle charging
- Light pollution reduction
- Grading to manage surface water flow
- Shade trees
- Water conserving plumbing fixtures
- Outdoor potable water use in landscape areas
- Water resistance and moisture management
- Building Reuse
- Construction waste disposal and recycling
- Recycling by occupants
- Pollutant control during construction
- Finish material pollutant control
- MERV-13 filters
- CO2 monitoring in classrooms
- Acoustical control and exterior noise transmission
- HVAC refrigerants without chlorofluorocarbons and halons
- Embodied Carbon of Materials



CALGreen Code Development

Learn about the role of DSA in proposing changes to the building code regulations related to green building standards for public K-12 schools and community colleges.

CONTACT CALGREEN CODE DEVELOPMENT

Headquarters Office

1102 Q Street, Suite 5100

Sacramento, CA 95811

(916) 445-8100

In order to promote sustainability, DSA collaborates with stakeholders, experts and public entities to develop green regulations that govern the construction of buildings in California. We propose changes to the California Building Standards Code ([Title 24 Overview](#)), as well as develop and publishing interpretations of code and policies and procedures necessary for stakeholder understanding and coordination of enforcement among the DSA regional offices.

The building code becomes law when it's formally enacted by the appropriate authority. We are one of several state agencies that propose changes to the California Building and Administrative codes through the Building Standard Commission's rulemaking process. The creation of regulation is directed through law. Regulations govern how the law will be enforced.

Some documents posted on this webpage use underline, strikethrough, italic, and ellipsis. If you use assistive technology, such as a screen reader, please adjust your settings to recognize these ASCII (American Standard Code for Information Exchange) characters.

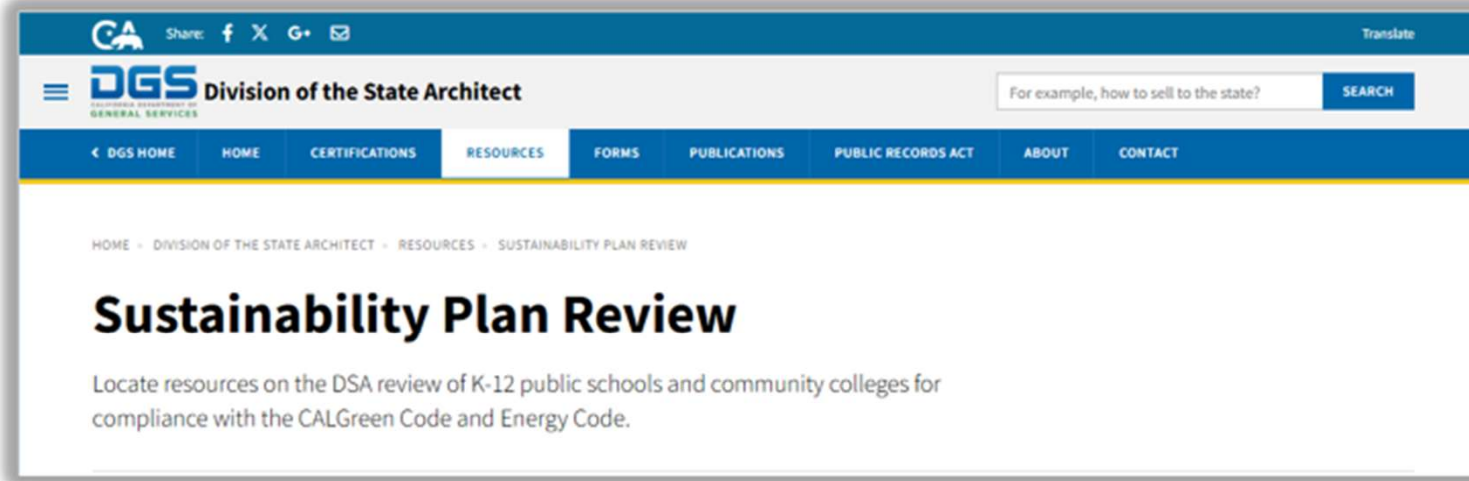
Expand All

DSA CALGREEN (DSA-SS)	+
DSA-SS ACTIVE RULEMAKING	+
DSA-SS RULEMAKING ARCHIVE	+

Regional Sustainability Architect (RSA)

- New positions to support the DSA Sustainable Schools Program
- One in each DSA regional office:
 - Los Angeles – Barbara Gonzalez
 - San Diego – Somayeh Tabatabaee
 - Sacramento – May Lin Chan
 - Oakland – In Hiring Process





RSAs will:

- Assist with Plan Review of Pre Check Designs (PC) for:
 - CALGreen Compliance
 - Energy Compliance
- Perform Intake process for CGE Verification:
 - DSA 403, and 403-PC
- Review OPSC Supplemental Energy Efficiency Grant submitted to DSA



DSA

RSAs will assist with:

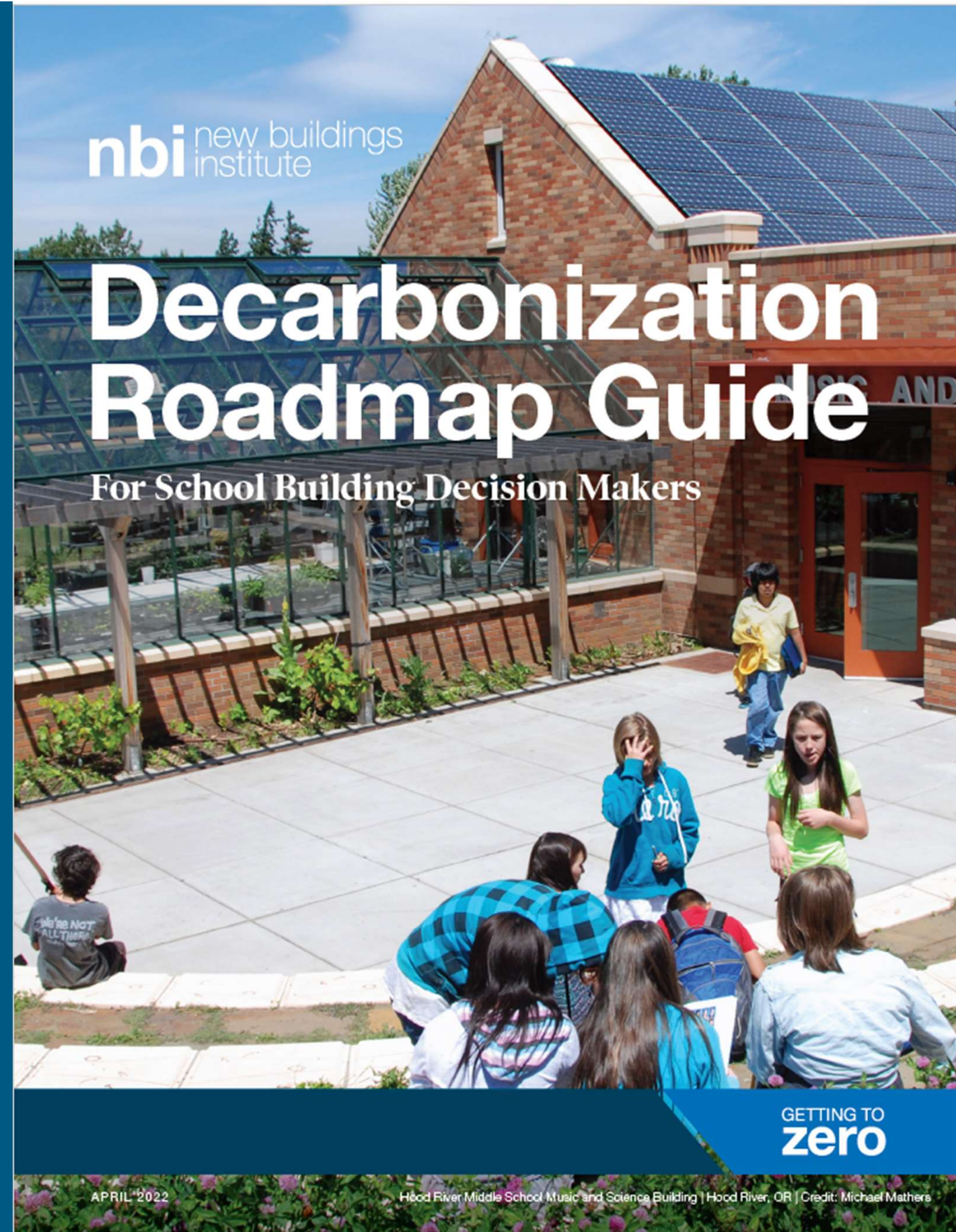
- Greater support at pre-application meetings
- Greater compliance of requirements
- Understanding of challenges in implementation
- Understanding of resources that need to be developed

Decarbonization Toolkit

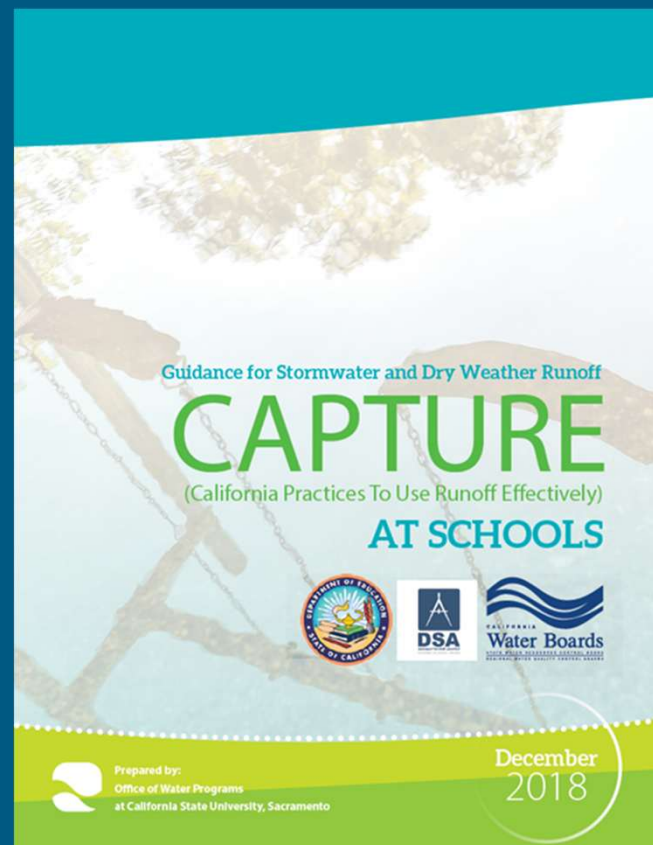
- Stakeholder Engagement
- Goals
- Resolution
- Facility Assessment
- RFP
- Interview Q's
- OPR
- Project Checklist
- Reporting Template
- Media Release
- ZNC Bond Criteria



[Decarbonization Roadmap Guide for School Building Decision Makers - New Buildings Institute](#)



Stormwater Capture and Runoff Management



Preserve, create, and enhance natural areas and features.

Minimize impervious surfaces.

Design with soils that promote infiltration.

Arrange impervious surfaces to drain to permeable surfaces.

Design areas to prevent irrigation runoff.

Allocate space to stormwater control measures.

Incorporate visual stormwater features and learning opportunities.





DSA 403 / 403-C

TRAINING FOR ENERGY CODE AND CALGREEN CHECKLISTS FOR SITE SPECIFIC DESIGNS

Curriculum

CALGreen & Energy Code Checklists for Site

1 hour

...



PR 18-02 / 403PC

CALGreen & Energy Code Procedures

Curriculum

CALGreen & Energy Code Procedures and

...



Video

Induction Cooking and the All-Electric,

2 hours, 5 minutes

...



Curriculum

California EVCS Accessibility:

...


Share:









Division of the State Architect

For example, how to sell to the state?

SEARCH

← DGS HOME

HOME

CERTIFICATIONS

RESOURCES

FORMS

PUBLICATIONS

PUBLIC RECORDS ACT

ABOUT

CONTACT

HOME

»

DIVISION OF THE STATE ARCHITECT

»

RESOURCES

»

DSA ACADEMY

DSA Academy

DSA Academy provides training on school construction plan review, building code application, accessibility requirements, and other related topics under DSA's jurisdiction.



2027 Relaunch

Sustainable Schools Showcase



- A return of the showcase in the last quarter of 2026
- Call for exemplary sustainable project to feature
- Please reach out to:
 - Alicia.chavez@dgs.ca.gov
 - DSASustainability@dgs.ca.gov

RESOURCES:

Oakland HS Environmental Design Student Capstone Project video:

https://drive.google.com/file/d/16JASjAQTroWD_gmnyc_xfEQZrNBJ0N6W/view

K12 Education and the Inflation Reduction Act

<https://www.thisisplaneted.org/img/K12-InflationReductionAct-Final-Screen.pdf>

LAUSD Energy Conservation

<http://learninggreen.laschools.org/energy-conservation.html>

CHPS Resources and Product Guidance

<https://chps.net/>

DSA Achieving Net Zero Energy, Net Zero Carbon and Sustainable School Facilities

<https://www.dgs.ca.gov/DSA/Resources/Page-Content/Resources-List-Folder/Achieving-Net-Zero-Energy-and-Net-Zero-Carbon-in-School-Facilities>

New Buildings Institute Decarbonization Guide

K12 Education and the Inflation Reduction Act

https://newbuildings.org/hot-off-the-presses-new-grid-interactive-buildings-for-decarbonization-guide/?utm_content=271193131&utm_medium=social&utm_source=linkedin&hss_channel=lcp-3176424

- DSA Green Schoolyards Academy
- Green Schools National Network
- Schoolyard Forest System

I-HED



PRESENTER CONTACT INFO:

- Mary Ruppenthal, HED: mruppenthal@hed.design
- Christos Chrysiliou, LAUSD: christos.chrysiliou@lausd.net
- Ida Clair, DSA: ida.clair@dgs.ca.gov

HED



THANK YOU!

HED

