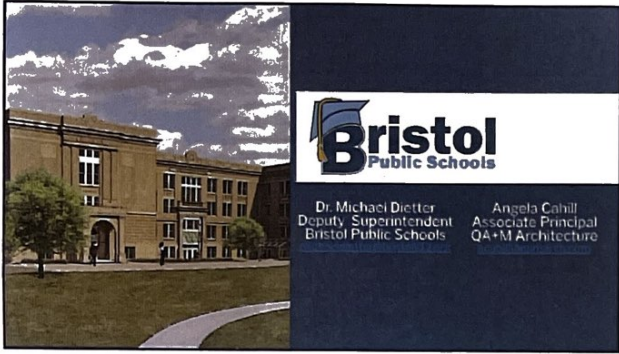


> non-meeting to debrief  
> wk9 mtg



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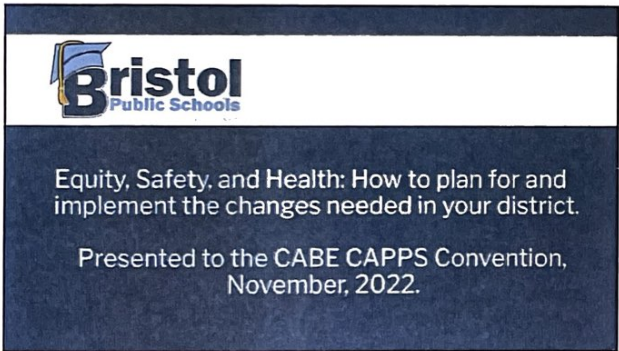
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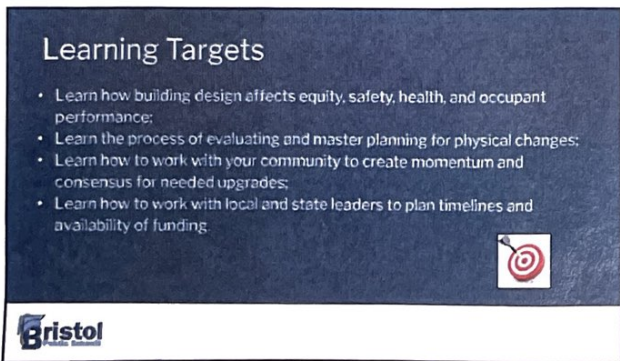
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# I. Physical + Mental Health <sup>AIT</sup> Educational Performance

### Building Design Contributes to Physical and Mental Health

*Green Schools: Attributes for Health and Learning*, Spengler et al, National Research Council of the National Academies, 2007

*The Impact of School Buildings on Student Health & Performance*, Baker & Bernstein, The Center for Green Schools, 2012



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### Building Design Contributes to Physical and Mental Health

25% of our nation's population spends the majority of their time in school buildings

**Characteristics needed:** Comfort, Air Quality, Quietness, Cleanliness, Aesthetics

- Daylight and views
- Temperature and lighting controls (heating and cooling, tunable & dimmable light)
- Natural & increased ventilation, filtered air, moisture management, pollutant resistance, carbon dioxide response, infection control
- Acoustical design for aural and vocal health, and focus
- Cosmetically pleasing for emotional health
- Healthy Food & Water
- Mobility and indoor/outdoor experience between activities



CT standards already one of highest in nation -

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### Building Design Contributes to Physical and Mental Health

**Older schools may have:**

- hazardous materials
- loud noise
- low spectrum fluorescent lighting
- moisture penetration of building envelope
- lack of ventilation, thermal control & air conditioning



Asbestos in concrete + plaster

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## Building Design Contributes to Physical and Mental Health

### EXAMPLES:

- When students are deprived of natural daylight, their circadian cycles are disrupted, leading to lower levels of alertness
- Teachers report higher level of comfort when they have access to thermal controls and operable windows
- When ventilation rates are lower than 10 cfm per student, certain student performance tests result are lower by 1-15%
- When ventilation rates are as low as 10 cfm per student, symptoms indicating sick building syndrome are prevalent




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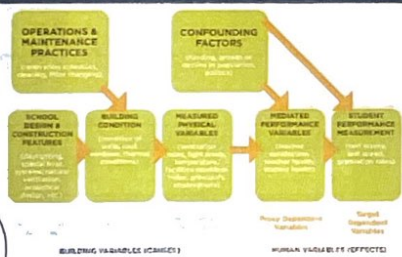
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## Combining Buildings and People



Design of School Buildings  
 by Steven M. Winter &  
 Lawrence J. The Center for Green  
 Schools, 2012



Reference

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## Building Design Contributes to Physical and Mental Health

"Cash found significant differences between the achievement scores of students in substandard buildings and those in above standard buildings when the overall condition of the building was used as a measure. She also found that students were more affected by the cosmetic than the structural condition of a building. The difference between test scores of students in substandard and above-standard buildings ranged from 2 to 5 percentile points, depending on the subject (i.e., mathematics, reading)."

"In [Earthman, North Dakota] all but one subject (social studies) of the CTBS, students in above standard buildings outscored students in substandard buildings. The difference was... 1 from 1 to 3 percentile points."



reference

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Test scores improved = cosmetic + above std buildings



### Green Schools = Healthy Schools

How students HEAR – background & ambient noise  
 How students BREATHE – clean indoor air  
 How students SEE – daylight, light levels & views  
 How students FEEL – consistent temperature range  
 How students THINK & LEARN – environmental factors  
 How students MOVE – active design & travel

How students REACT:  
 - emotions related to surrounding aesthetics and comfort  
 - physical response to quality of food & water  
 - comfort knowing they are in a safe & healthy environment


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### Green School Design Process and Categories

**GUIDES:**

- CT HPR and State Code Updates
- LEED Certification or equivalent
- Gen. Comm. Change Exec Order 21-3
- Fossil Fuel free
- Net Zero Options
- Evensource: Carbon Neutral by 2030

**SYSTEMS:**

- HVAC System Options
- Maximize Natural Light
- Well-Insulated Envelope (PHIUS)
- Centrate
- Evaluate First Cost vs. Payback
- Renewable Fuel Sources or Contracts


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### Connecticut Schools: Plenty of Work to Do

Age of School Facilities Based on Year of Construction					
Age	Count	Value	Area	Count	Value
Up to 10 years	27	11	21	2	91
11 to 20 years	23	27	18	8	79
21 to 30 years	162	148	62	5	288
Greater than 30 years	288	69	15	14	587


9%  
56%

Age of School Facilities Based on Last Renovation					
Age	Count	Value	Area	Count	Value
Up to 10 years	170	49	115	9	248
11 to 20 years	107	89	47	10	322
21 to 30 years	270	58	34	7	365

34%  
31%  
35%

1,041 School Buildings

Report on the Condition of Connecticut's Public School Facilities 2012



*schools built to last 20-50 yrs.*

*new scumy went out post-covid.*

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*Climate Δ Executive order (CT) □*

*report □*

## II. Equity/Safety/Health.

Building Design Can Provide Equity



**Bristol**

1984 - equity for physical differences.  
NO Δ's

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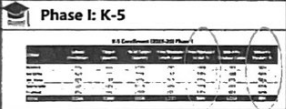


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### The Context for Equity, Safety, and Health

Building Design(s) should align with the 10 year capital plan

- Needs assessment and priorities
  - Targeted renovations vs new construction
- Feasibility
- Enrollment



**Bristol**

> Relate project back to data.

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\* - enrollment projections -

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\* - board goals / LT plan - / vision

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> 3-5yrs reno/build project timeline.

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> Climate + equity policies

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### The Context for Equity, Safety, and Health

Utilizing Board of Education Goals/Priorities


BOE Policy and Regulation

Committee work

- Operations
- Building/construction

District Leadership and Improvement

- DEI Climate and Equity
- Office of Teaching and Learning (curriculum)



**Bristol**

Climate



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Curriculum.

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### Equity Design Categories

- Parking & Accessible Routes
- Equity in Entrance Sequence
- Horizontal & Vertical Circulation
- Toilet Facilities
- Signage & Notification
- Seating & Views
- Reach Ranges
- Doors and Hardware
- Textures, Patterns & Colors
- Emergency Egress



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### Equity in Design - Examples



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### Equity in Design - Physical and Intellectual

Designing an equitable environment for staff and students with both Physical and Learning differences

- Main entrance for all
- Equitable quality of space, lighting, features
- Easy & clear circulation paths
- Flexibility & opportunity of differing viewpoints
- Addressing each of the 5 physical senses



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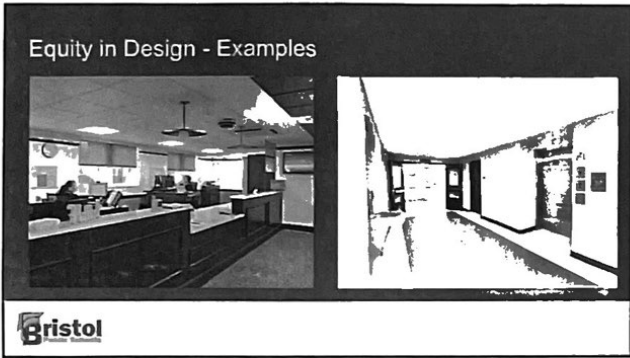
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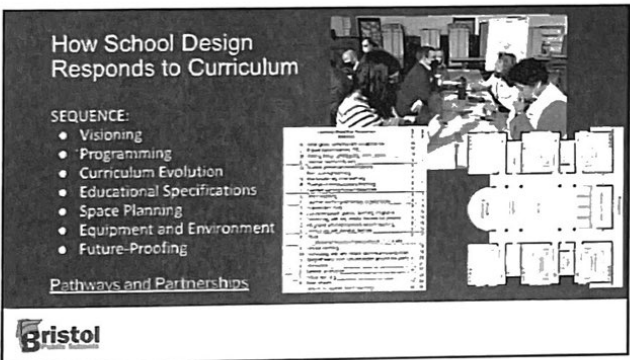
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### III. Curriculum.



Plans from 12 yrs ago may not be relevant to Δ in education today; May not fit new needs for future.

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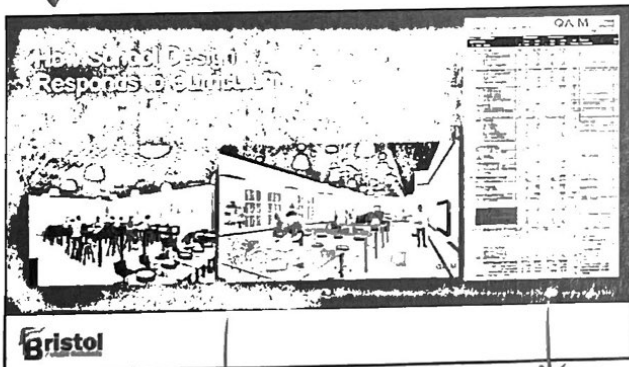
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↙ Bristol Arts + Innovation Magnet School

email for slide deck & links.



↓  
3D models

↓  
cost analysis

> partnership = local university art program - artists in residence program  
↓  
now HS students taking college credits there



# IV. School Security

**How School Design Provides Safety & Security**

- > Deterrence
- > Detection
- > Delay
- > Response



**Bristol**  
School Solutions

being updated

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**How School Design Provides Safety & Security**

- Includes emergency preparedness + resiliency
- Critical design decisions from the start
- Drop offs, visibility + control of access
- SBPAC / SSIC / OSG&R
- Coordinate with DESPP + DEMHS
- Lockdown accommodations
- Lock off after hours for community use
- Glazing locations and varieties
- Welcoming, use "hidden" strategies



**Bristol**  
School Solutions

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**How School Design Provides Safety & Security**

**SSIC Handbook Categories:**

- Site Perimeter
  - Access Control & Surveillance
- Parking, Vehicle & Pedestrian Routes
- Recreational Areas
- Communication Systems
- School Building Exterior
  - Doors, Windows, Entrance Sequence
- School Building Interior
  - Classrooms & Assembly Areas
- Roofs
- Critical Assets / Utilities
- Other Areas



**Bristol**  
School Solutions

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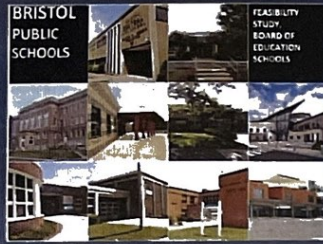
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## Studying Your Physical Assets



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## Communication and Advocacy for Equity, Safety, and Health

Students, families, and employees

- Thought Exchange and other platforms such as Twitter, Instagram, etc
- Surveys differentiated by groups
- Board Workshops
- PTO and PTA



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## Advocating for Equity, Safety, and Health

Local/regional boards, officials, and special interest groups

- Alumni, Historical Society, etc
- Consistency of schedule and reinforcement of message

**BRISTOL HISTORICAL SOCIETY**  
68 Summer Street | Bristol, Connecticut 06010 USA



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### Studying Your Physical Assets

Bristol Public Schools - Option 5a Phase Two

Existing Conditions of the school facilities are summarized in the following table:

Facility Name	Grade	Year	Year	Building Area (Sq Feet)	Capacity (Students)	Notes
Sheldon	K-5	1954	2004 (1997 remodel)	41,000	22	4 Phase
Edmond	PK-5	1957	1992	44,000	19	4 Phase
Hubbell	PK-5	1961	1982	63,000	20	2 Good
Jay Drive	PK-5	1967	2007	58,000	17	1.5 Good
Adoptive Way	PK-5	1967	2007	51,000	18	1.5 Good
South Side	K-5	1973	2014, remodel	61,000	17	3 Fair
Northwest Middle	K-5	1961	1993 (2007 roof)	74,000	21	4 Phase
Christina Hall	K-5	1978	---	106,000	26	1.5 Fair/Good
Steele School	K-5	1912	---	122,000	28	3 Good
Greenwood	PK-5	1912	---	122,000	17	3 Good
Rayburn High School	9-12	1918	1989	238,000	50	3 Fair
Central High School	9-12	1947	1979	211,000	58	3 Good

**Bristol**

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### Proposing the Plan

AMSLING / POTENTIAL SCHEDULE

LOGIC COMPARISON: OPTION 1 vs. OPTION 4

Category	Option 1	Option 4
Construction	\$100,000,000	\$100,000,000
Equipment	\$10,000,000	\$10,000,000
Professional Fees	\$5,000,000	\$5,000,000
Contingency	\$15,000,000	\$15,000,000
<b>Total</b>	<b>\$130,000,000</b>	<b>\$130,000,000</b>

CIP Forecast: \$56.2 million

Option 4: \$41.5 million

**Bristol**

CIP — eval. of what we need to spend on upkeep over time frame

- Bristol — phase plan of renovation + build
- they are now building a new bldg on a current school site.
- building a centralized pre-K bldg

### Funding and Timelines

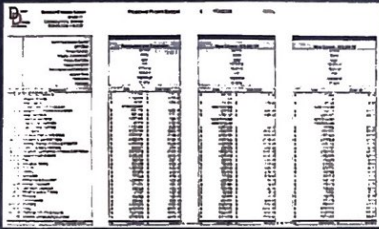
- Local governance structures
- Engaging leaders and elected officials
- Education Specifications
  - Submittal and approval process
- Shepherding the work
  - Communication
  - Substantial benchmarks
  - Tours

**Bristol**

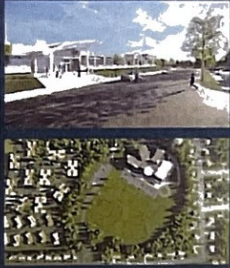
ED Specs: must stay on target for state \$ reimbursement

Master Plan — long time to gather info to plan, just by cost, regulation  
 3-5 yr process 2018-2023

### Proposing the Plan



Task	Start	End	Duration
Task 1	1/15/2020	1/22/2020	7 days
Task 2	1/22/2020	1/29/2020	7 days
Task 3	1/29/2020	2/5/2020	7 days
Task 4	2/5/2020	2/12/2020	7 days
Task 5	2/12/2020	2/19/2020	7 days
Task 6	2/19/2020	2/26/2020	7 days
Task 7	2/26/2020	3/5/2020	9 days
Task 8	3/5/2020	3/12/2020	7 days
Task 9	3/12/2020	3/19/2020	7 days
Task 10	3/19/2020	3/26/2020	7 days
Task 11	3/26/2020	4/2/2020	7 days
Task 12	4/2/2020	4/9/2020	7 days
Task 13	4/9/2020	4/16/2020	7 days
Task 14	4/16/2020	4/23/2020	7 days
Task 15	4/23/2020	4/30/2020	7 days
Task 16	4/30/2020	5/7/2020	7 days
Task 17	5/7/2020	5/14/2020	7 days
Task 18	5/14/2020	5/21/2020	7 days
Task 19	5/21/2020	5/28/2020	7 days
Task 20	5/28/2020	6/4/2020	7 days
Task 21	6/4/2020	6/11/2020	7 days
Task 22	6/11/2020	6/18/2020	7 days
Task 23	6/18/2020	6/25/2020	7 days
Task 24	6/25/2020	7/2/2020	7 days
Task 25	7/2/2020	7/9/2020	7 days
Task 26	7/9/2020	7/16/2020	7 days
Task 27	7/16/2020	7/23/2020	7 days
Task 28	7/23/2020	7/30/2020	7 days
Task 29	7/30/2020	8/6/2020	7 days
Task 30	8/6/2020	8/13/2020	7 days
Task 31	8/13/2020	8/20/2020	7 days
Task 32	8/20/2020	8/27/2020	7 days
Task 33	8/27/2020	9/3/2020	7 days
Task 34	9/3/2020	9/10/2020	7 days
Task 35	9/10/2020	9/17/2020	7 days
Task 36	9/17/2020	9/24/2020	7 days
Task 37	9/24/2020	10/1/2020	7 days
Task 38	10/1/2020	10/8/2020	7 days
Task 39	10/8/2020	10/15/2020	7 days
Task 40	10/15/2020	10/22/2020	7 days
Task 41	10/22/2020	10/29/2020	7 days
Task 42	10/29/2020	11/5/2020	7 days
Task 43	11/5/2020	11/12/2020	7 days
Task 44	11/12/2020	11/19/2020	7 days
Task 45	11/19/2020	11/26/2020	7 days
Task 46	11/26/2020	12/3/2020	7 days
Task 47	12/3/2020	12/10/2020	7 days
Task 48	12/10/2020	12/17/2020	7 days
Task 49	12/17/2020	12/24/2020	7 days
Task 50	12/24/2020	1/7/2021	14 days



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### Equity Solved



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### Equity Solved



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Equity Solved



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Equity Solved



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IT in from start.

Project mgr dived by district  
separate bldg cont for each  
project

Equity Solved



Thank You!  
Michael Dietter, Ed.D  
Angela Cahill, AIA



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