

Space Planning Like Google and Harvard

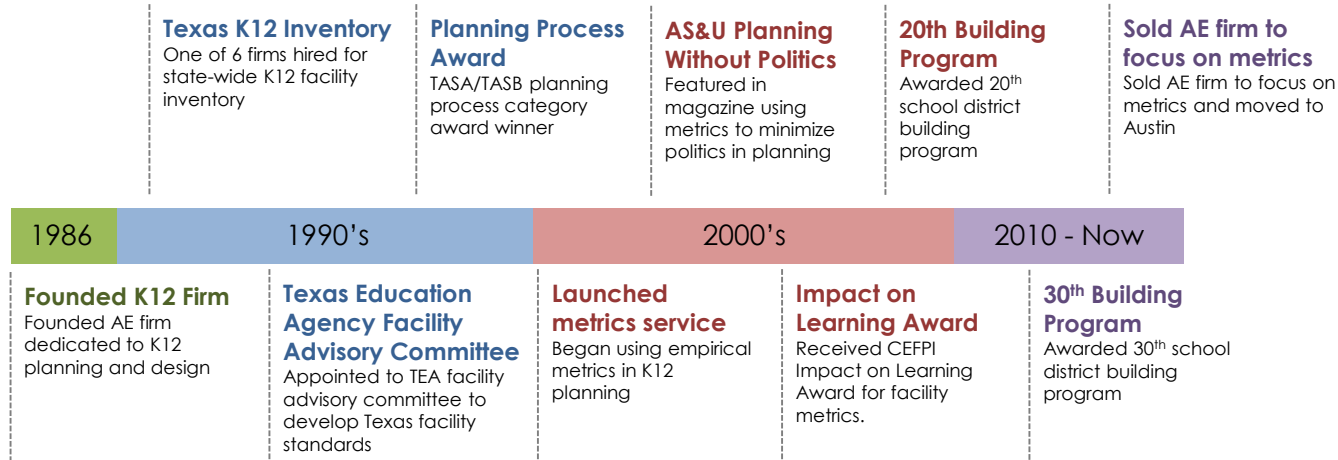


CEFPI Annual Conference 2014

presenter:

Monte Hunter

Monte Hunter AIA



- 30+ K12 planning and design programs
- Published in multiple magazines for facility metrics
- Multiple convention and conference metrics presentations
- CEFPI member for 23 years
- President of AE firm for 27 years
- Lives in Austin

What do these have in common?

Predictive Analytics

Apple

Ford

Google

Harvard

Honeywell

Major League Baseball

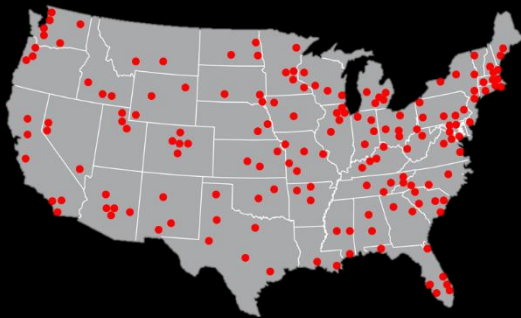
McDonalds

US Census

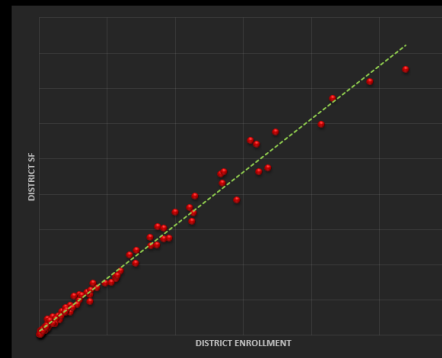
Discussion Items

- ☒ What is predictive analytics (PA)?
- ☐ Space planning with PA
- ☐ USA school space trends
- ☐ Other uses of PA in facility planning
- ☐ Wrap up

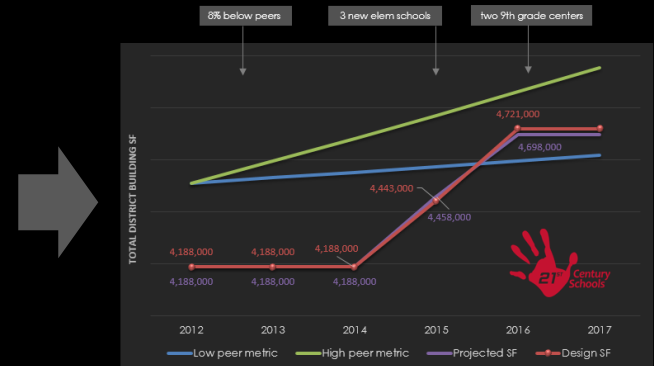
PA Process



data collection

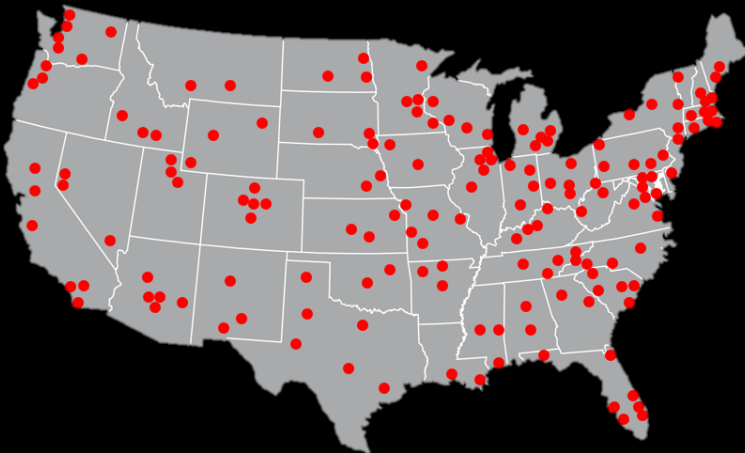


analysis & trends



metrics & modeling

Data & Validity



- 200+ USA school districts
- Districts with 500 – 200,000 enrollment
- District level correlation 95+
- Campus level correlation 80+
- Validated by PhD from University of Texas

H1N1 Vaccinations



Google Flu Trends

- Collect data from clinics
- Weeks to collect & analyze
- Flu already spread
- Often too late
- Analysis of flu search data
- Uses data to predict areas of need
- Real time results
- Improves in-time vaccine delivery

Harvard University

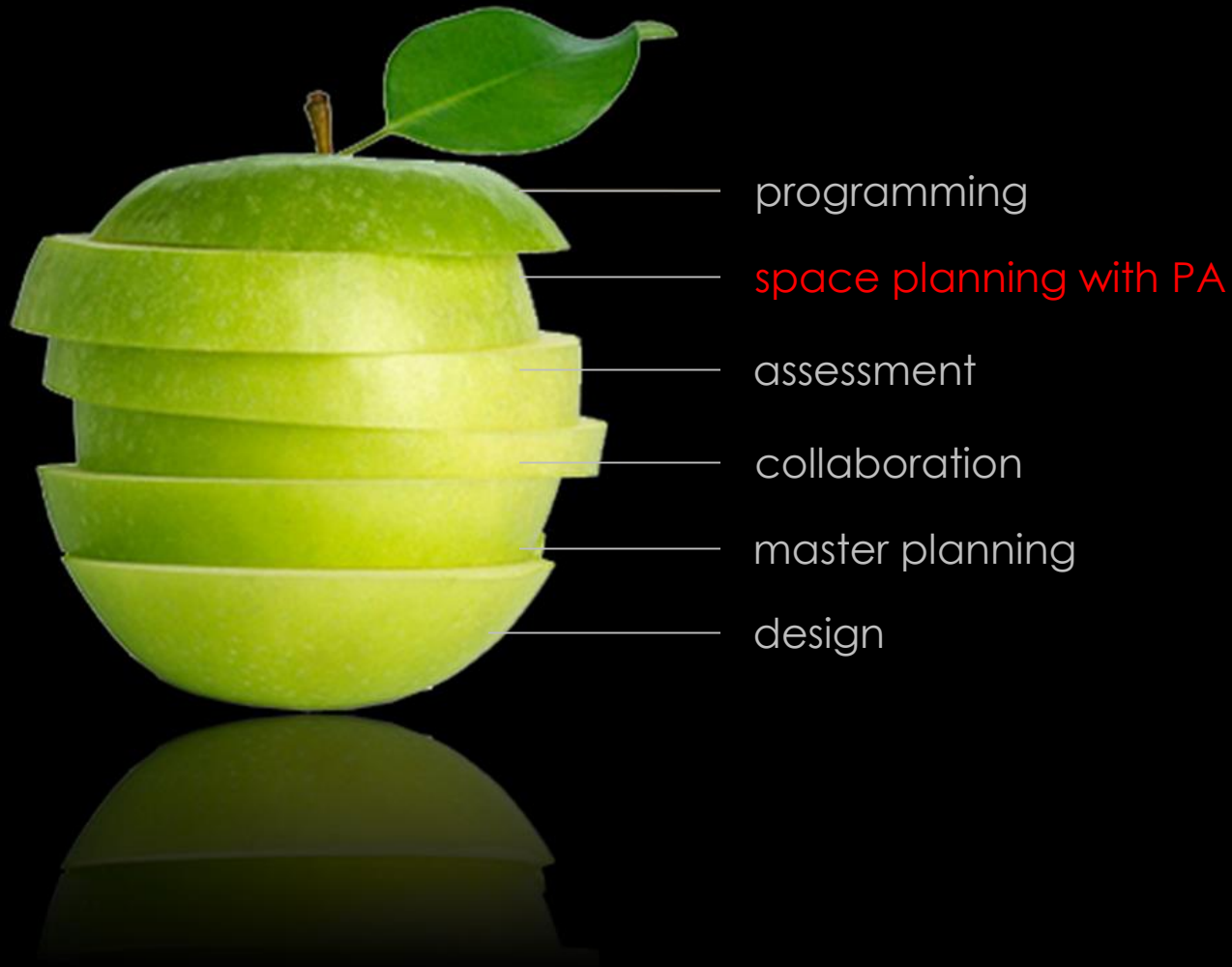


- Predictive analytics
- Student achievement
- Attendance
- Efficiency
- Teacher recruitment

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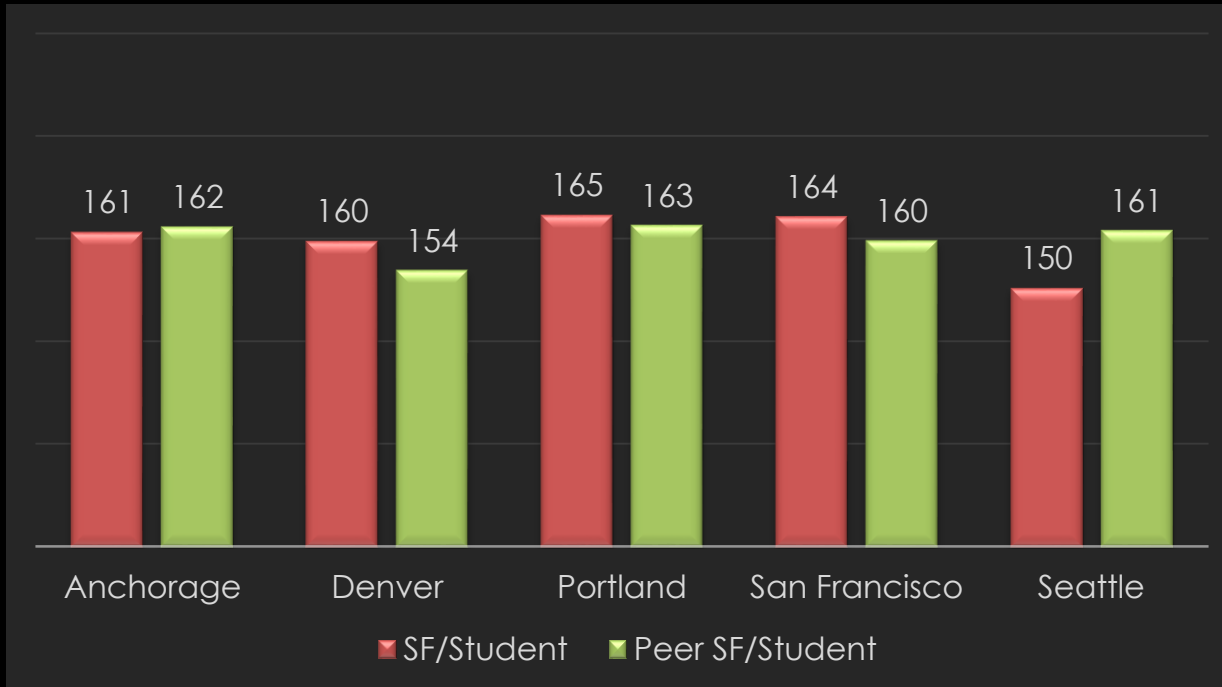
Space Planning Components



What PA can do

- Space guidance . . . district & campus level
- Space to be consistent with peers
- Space for emerging trends
- Results in days
- Conceptual scope before public events
- Collective practice of many districts & planners

SF per Student Metrics



- Regional peers
- If consistent with peers
- Scalable metric
- Not one-size-fits-all

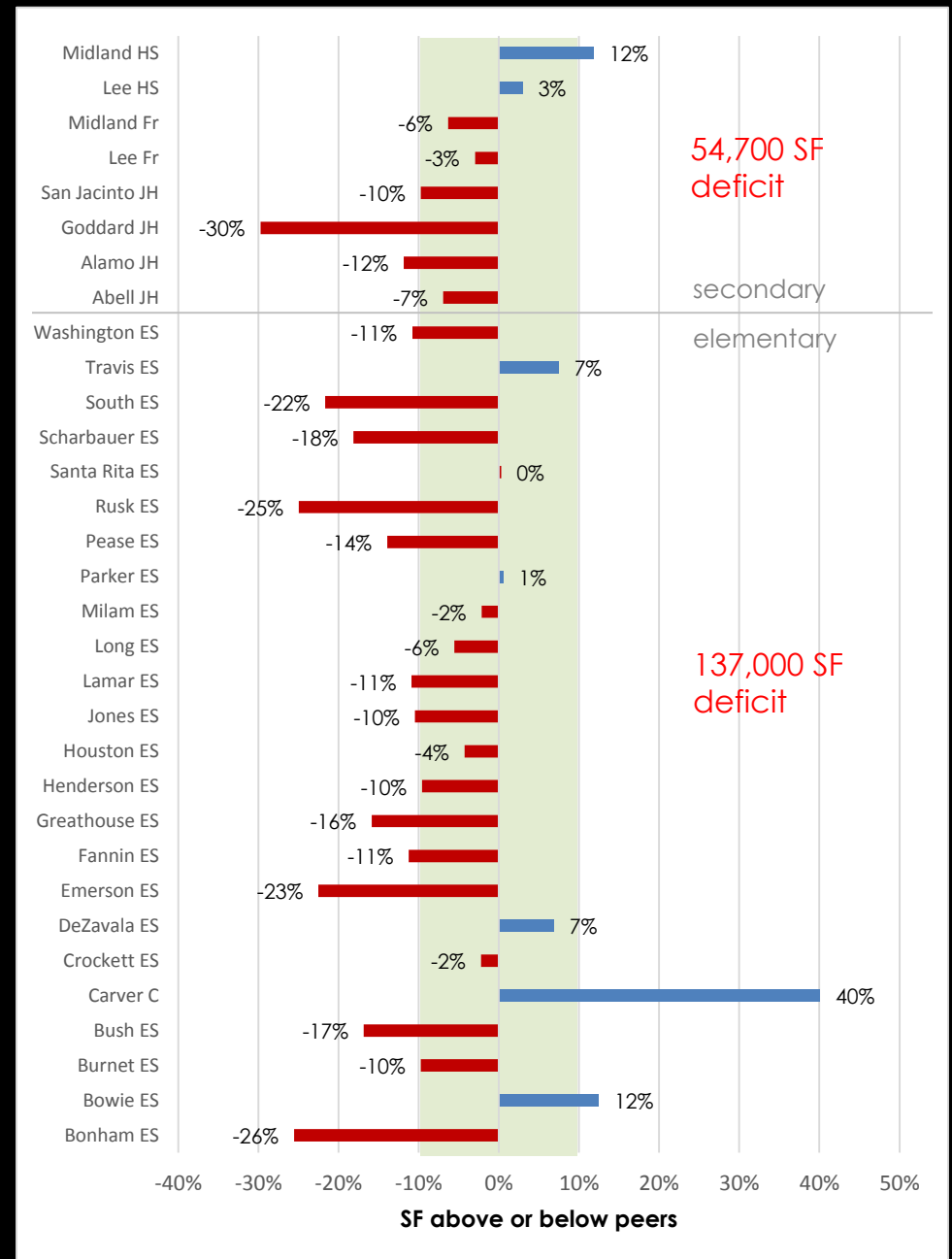
Total SqFt Metrics



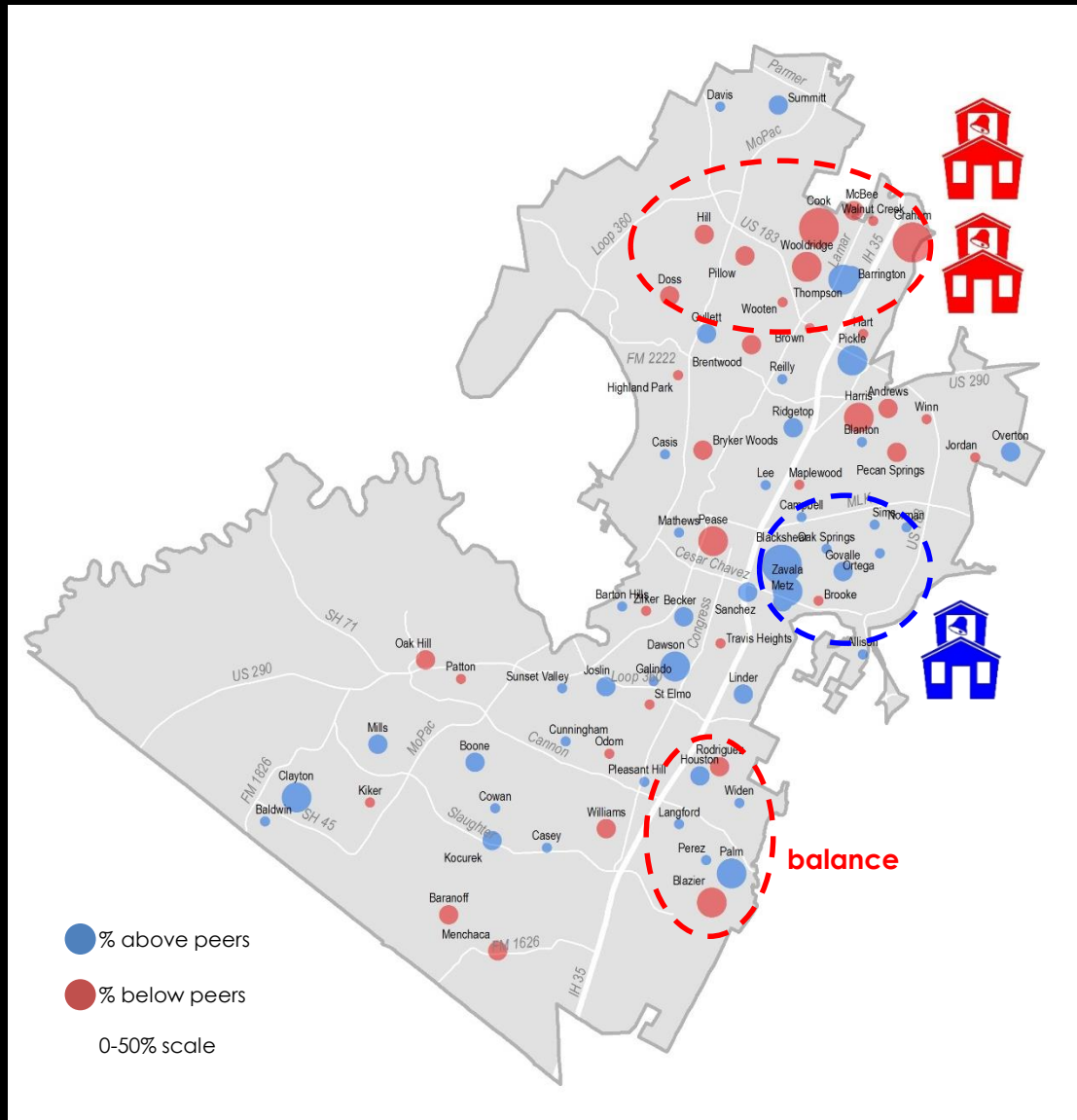
- If consistent with peers
- Macro benchmark
- Multiple benchmarks
- Justifies need

Campus Space Metric

- Wish list prioritization
- Facility equity
- Emerging programs
- Campus modifiers
- Justify space changes

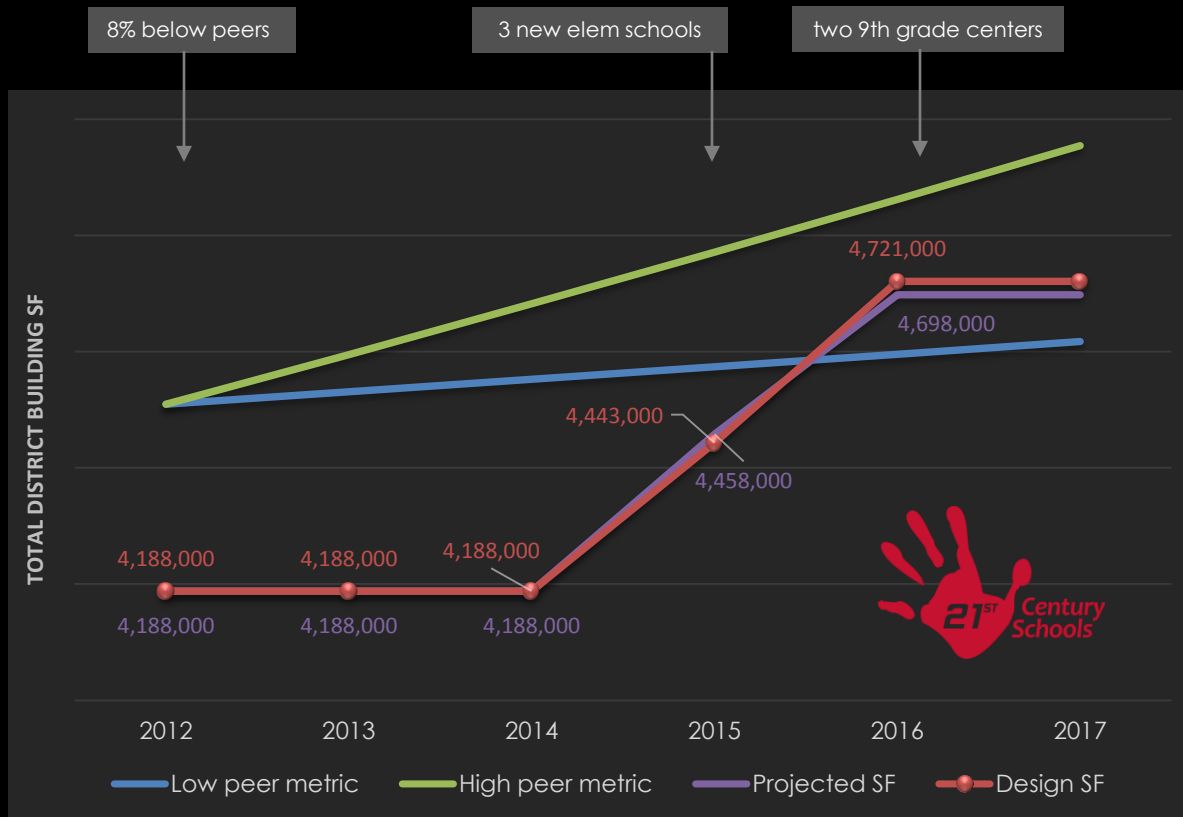


Campus SF Mapping - 2021



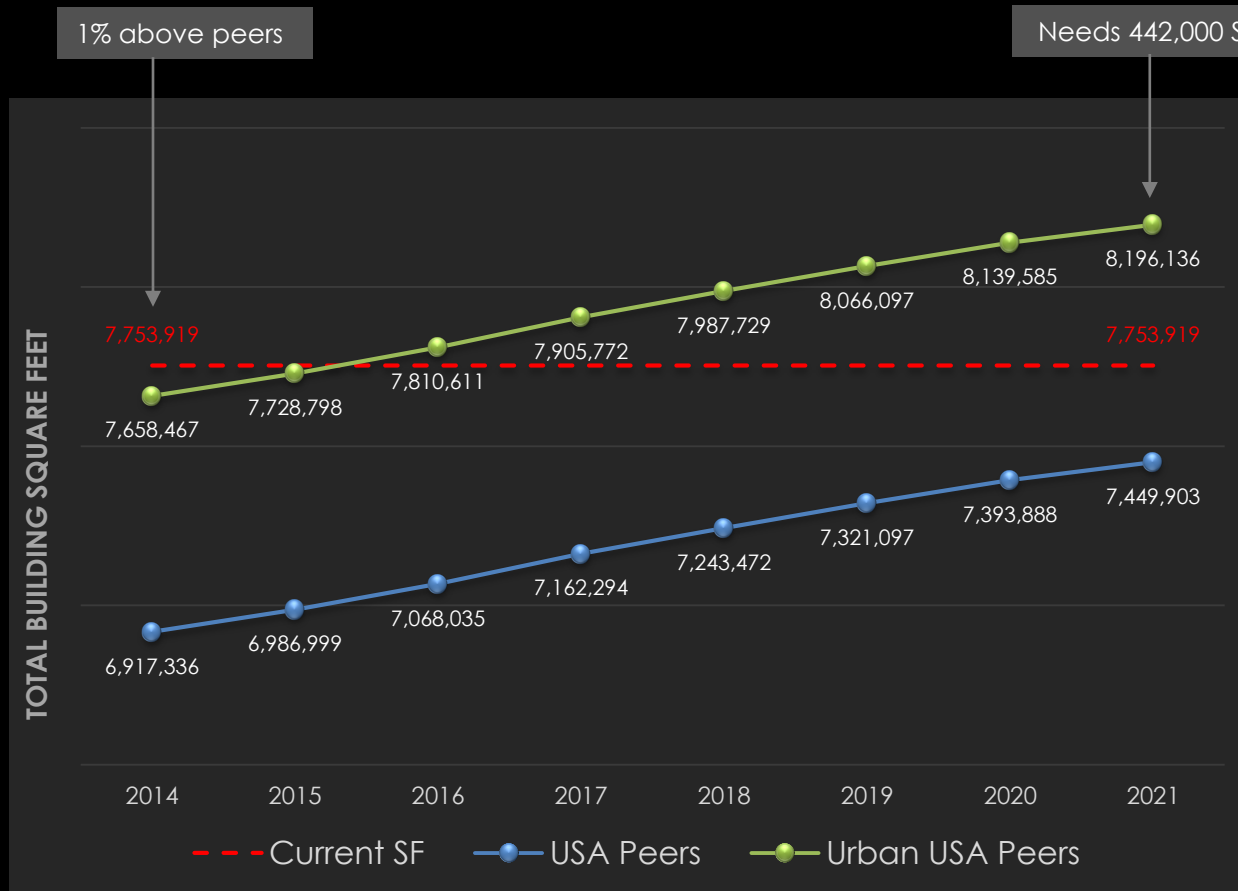
- PA & GIS
- Areas of need
- Identify trends
- Urban trend

Space Modeling



- Projects district SF
- Consistent with peers
- Tracks progress
- Demonstrates fiscal control
- Justifies needs

Space Modeling



- Urban district
- Needs SF to keep up with peers
- Demonstrates fiscal control
- Justifies new SF

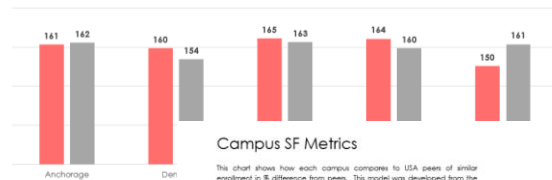
Results in Days

- Prior data collection & analysis
- Early scope definition
- Not a public event

Total Building SF Metrics

This chart shows the current square feet per student for major northwest public school systems (red bars).

The gray bars show how many square feet per student each district would have if they were consistent with USA peer school systems of similar enrollment. This model was developed from the statistical analysis of 150+ USA districts. The correlation of the model is .97.



Campus SF Metrics

This chart shows how each campus compares to USA peers of similar enrollment in % difference from peers. This model was developed from the statistical analysis of 150+ USA districts. The correlation of the model is .80+.

Red bars represent % below peers, or SF shortage.
Blue bars represent % above peers.

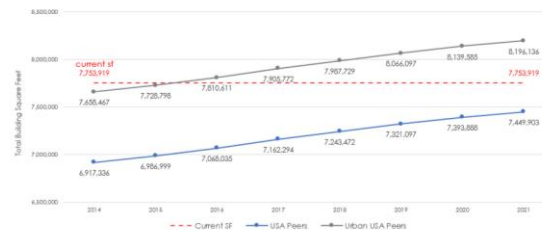


Building SF Modeling

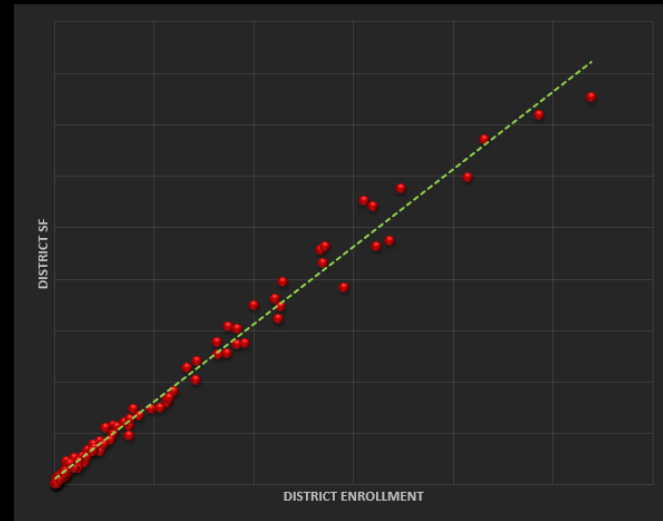
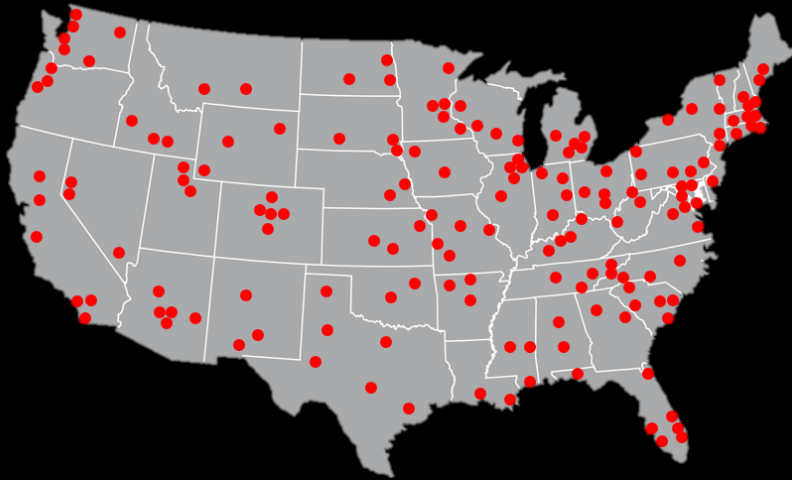
This chart models two PPS building square feet scenarios. First, the blue line, is USA peers. This model projects how many total building square feet PPS would have if consistent with USA peers with similar enrollment, using the medium PPS enrollment projection. This model was developed from the statistical analysis of 150+ USA districts. The correlation of the model is .97.

The second model, the gray line, is USA urban peers. Our research indicates that urban school systems have consistently more SF per student than non-urban school systems. This model projects how many total building square feet PPS would have if consistent with urban districts, using the medium enrollment projection.

this modeling represents the collective practice of many districts



Collective Practice of Many

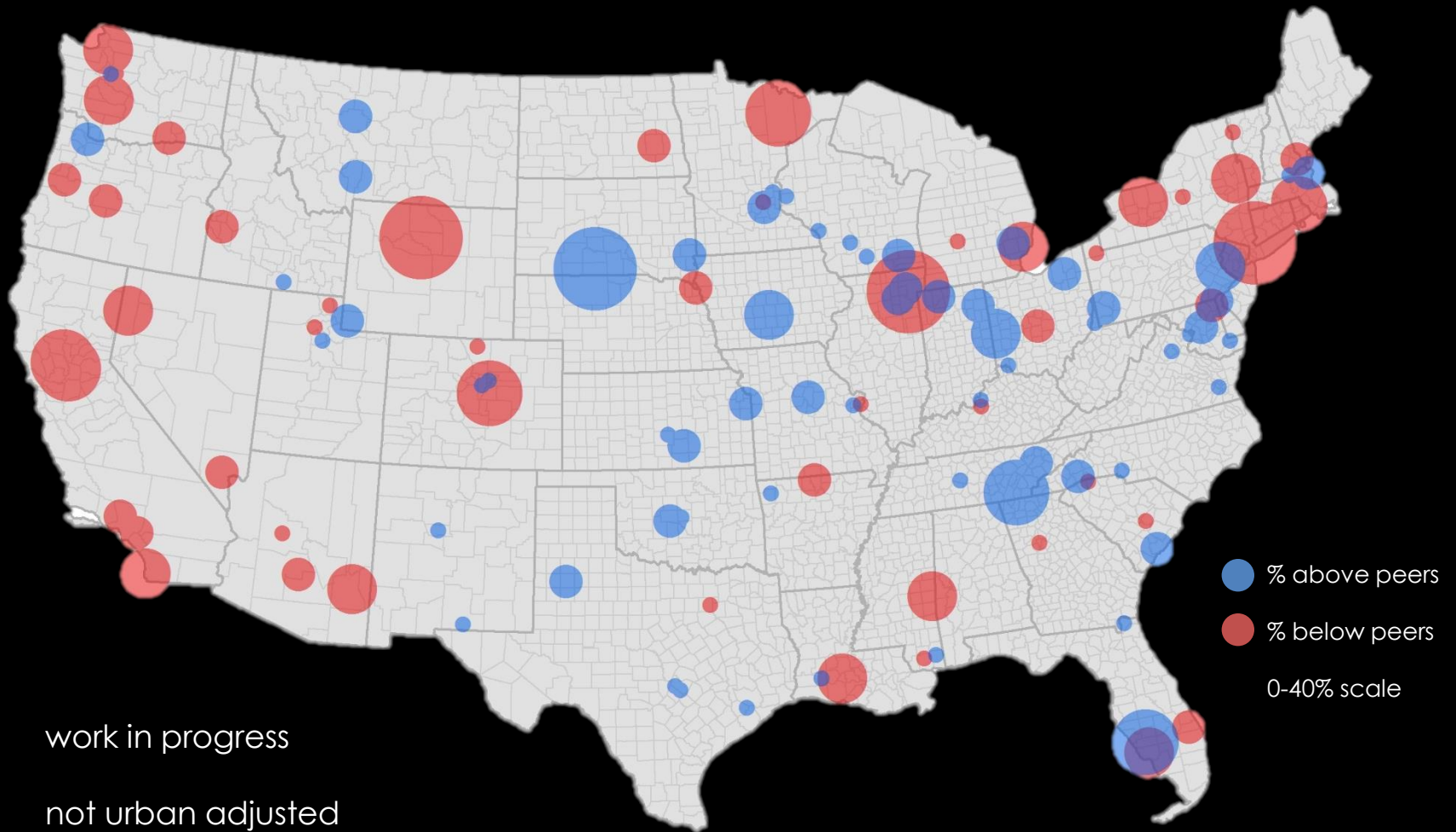


96% funding success rate

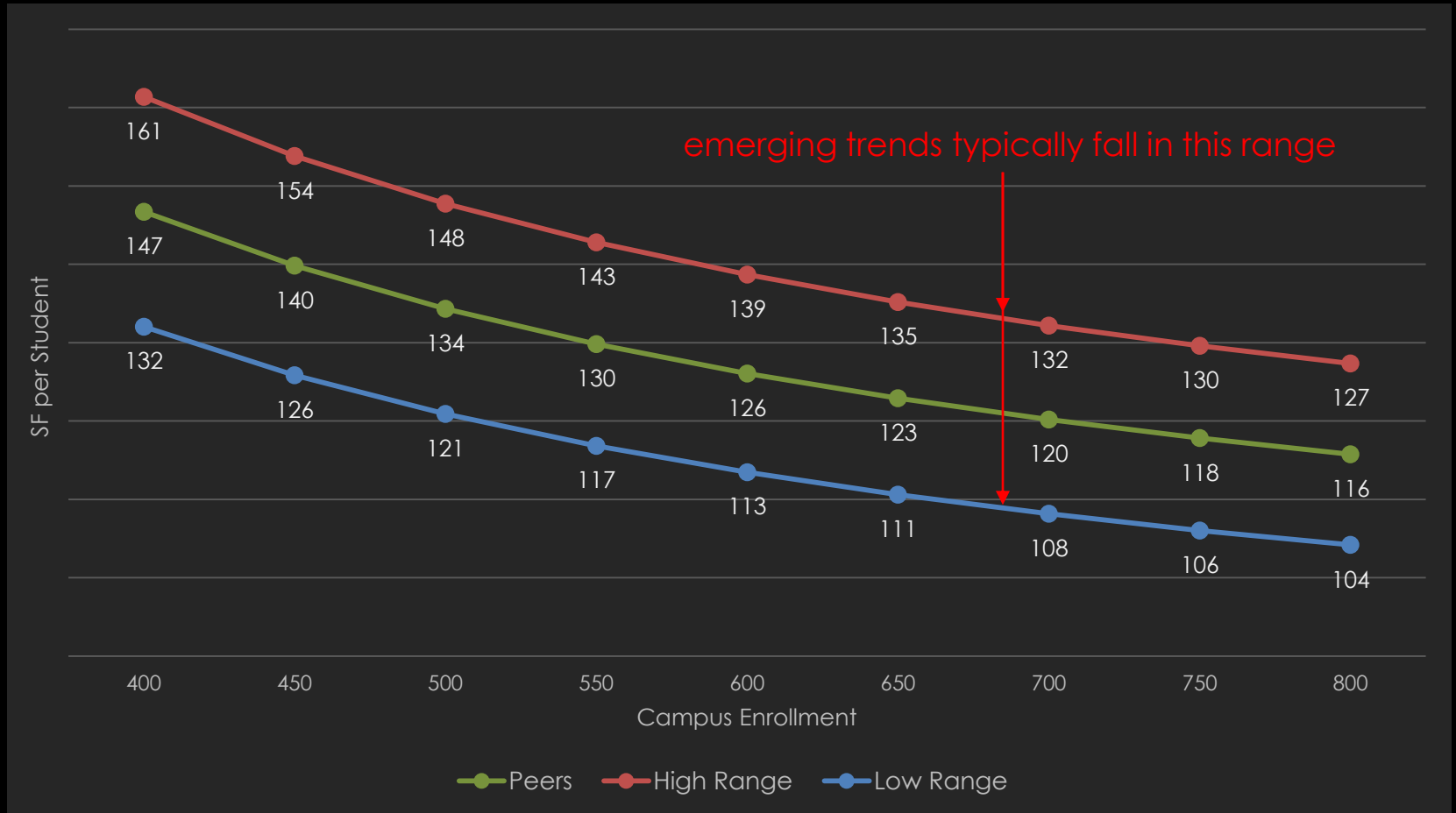
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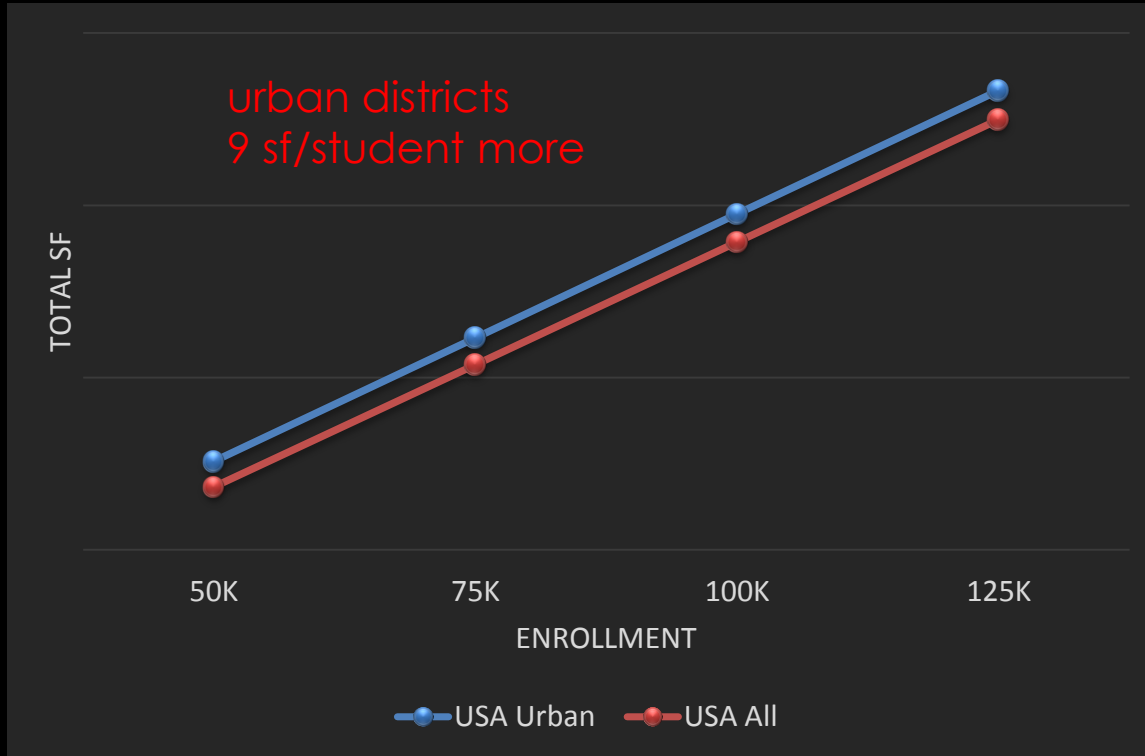
District SF vs USA Peers



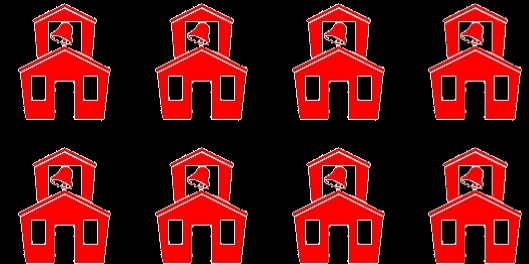
Elementary SF/Student



Urban Factor



- USA urban vs all districts
- Statistical trend lines
- In 75K district = 8 elem schools



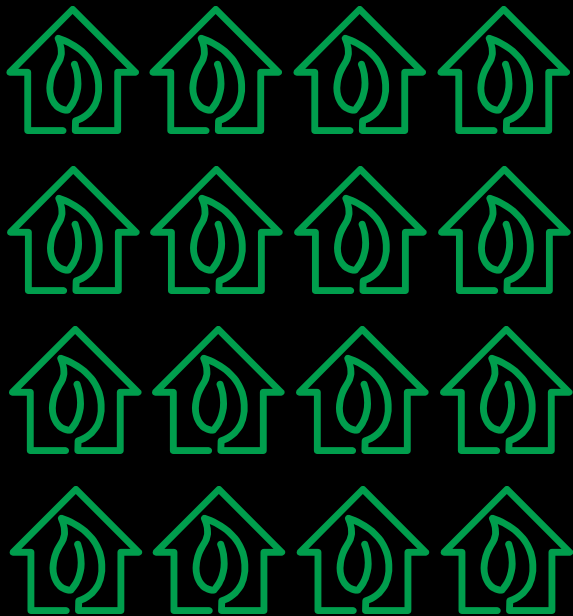
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Who uses space efficiency in sustainability efforts?

5% improvement in space efficiency for a high school

Heat and cool 16 houses



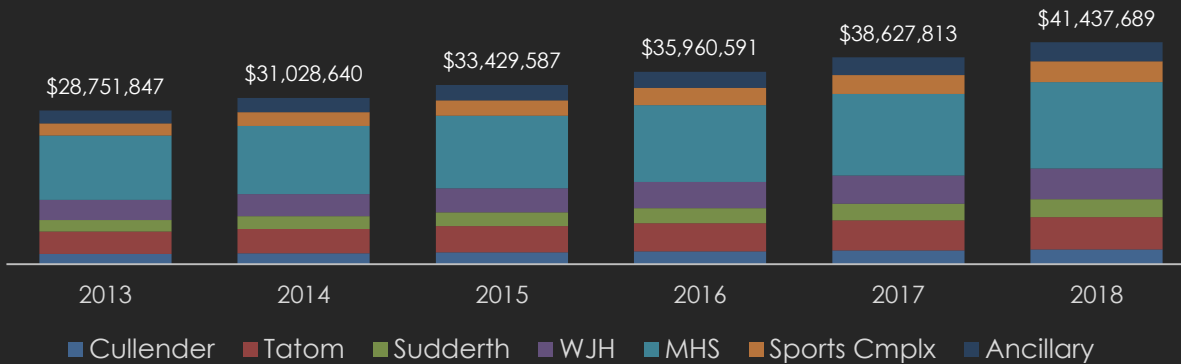
Save 90 pickups of construction waste



450,000 SF high school
2,000 sf house
4 lbs of waste per sf

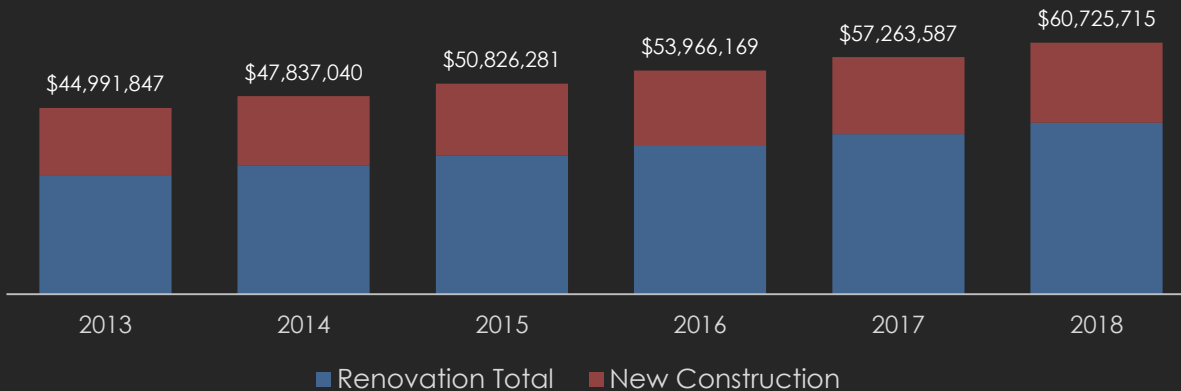
Capital Cost Projections

RENOVATION COST PROJECTIONS



- Model renovation cost
- Model new space cost
- Cost to defer
- Patent pending

CAPITAL IMPROVEMENT PROJECTIONS

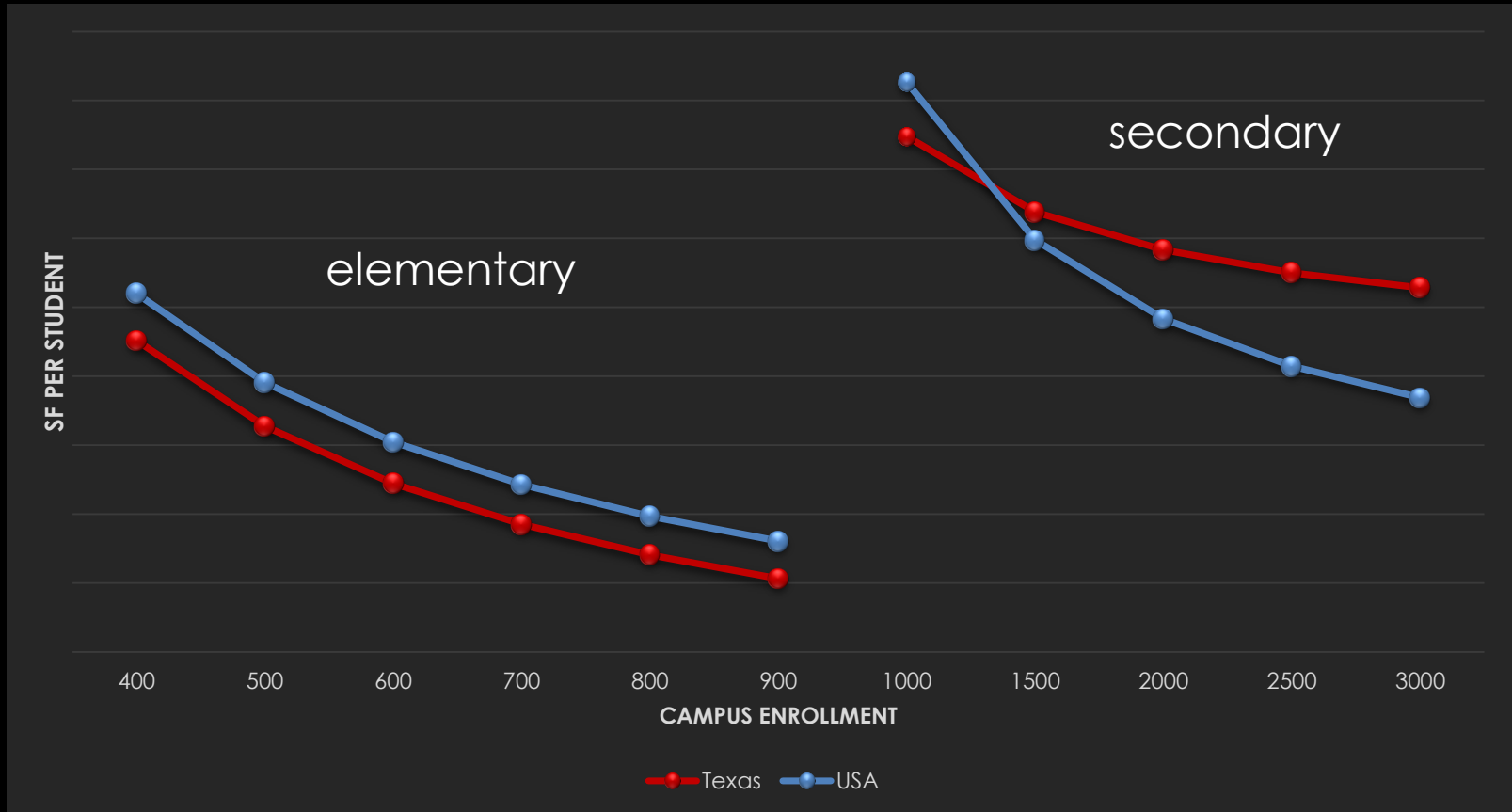


Facility M&O Modeling



- Models impact of facility expansion
- Efficiency targets
- Helps avoid moth balling new schools
- Excellent ROI

USA vs State Trends



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PA Benefits

- Peer-based guidance
- Collective practice of many
- Results in days
- Scope before public process
- Objective justification
- Facility equity
- Sustainability
- Funding success rate

PA is often resisted

A word cloud illustrating reasons for resistance to PA. The words are arranged in a cluster, with 'change' being the largest and most central. Other prominent words include 'different', 'politics', 'tradition', 'unknown', 'funding', 'fear', and 'control'. The colors used are white, light blue, and green.

change
different politics
tradition unknown funding
fear control

Until . . .



a citizen asks about over-building

remember . . .

Apple

Ford

Google

Harvard

Honeywell

Major League Baseball

McDonalds

US Census

Questions?

Monte Hunter AIA

mhunter@team-psc.com