Facilities Assessment Database and Associated Methodology

Presented by Andrew Martinez
Facilities Assessment Database Manager

STATE OF NEW MEXICO PUBLIC SCHOOL FACILITIES AUTHORITY

Partnering with New Mexico's communities to provide quality, sustainable school facilities for our students and educators.

Agenda

- The purpose of the Facilities Assessment Database (FAD)
- How
  - Facility Condition Index
  - New Mexico Educational Adequacy Standards
  - Deficiency Categories and Associated Weight Factors
  - Sources of data
- Result
  - Prioritized Capital Funding

Facilities Assessment Database (FAD)

- A tool used to prioritize public school facilities for funding through the Public School Capital Outlay Council (PSCOC)
  - Standards-based funding – replacement, additions, etc.
  - Systems-based funding – upgrade individual building systems

- Combines building repair cost and system lifecycle analysis with the New Mexico Adequacy Standards to evaluate brick and mortar conditions, as well as its educational functionality

How?

Must first determine a Facility Condition Index (FCI)

- A tool used to rate buildings and how these buildings compare to others
- By tracking needed repair cost within a school, we are then able to generate a score that will be used to relatively rank each school
- FCI is a ratio of repair cost, including lifecycle renewal requirements divided by its replacement cost

$$FCI = \frac{Repair\ Cost\ (\$)}{Replacement\ Cost\ (\$)}$$

FCI – Simple Example

- Assume a building within a school is estimated to be worth $1,000,000 and hail causes $150,000 in damage to the roof:

$$\frac{\$150{,}000}{\$1{,}000{,}000} = (0.15) * 100 = 15\%\ FCI$$

- Because of the hail damage the roof is now leaking. Interior ceiling tiles are now saturated, it is estimated to cost $20,000 to replace all the damaged ceiling tiles:

$$\frac{\$150{,}000 + \$20{,}000}{\$1{,}000{,}000} = (0.17) * 100 = 17\%\ FCI$$

FCI increases when more repairs are needed – **Lower FCI is better**

FCI – Repair Cost Components and Calculations

Two components

- Degradation
- Renewal Percentage (%)

Degradation

- In the previous examples, it is assumed that 100% of the roof and ceiling tiles were at the end of their expected life cycles or damaged. The FAD also captures degradation costs for building systems which are still within life cycle (less than 100% used).
- The key component in calculating still within lifecycle repair cost is called the “percentage used” of the building system.
- If the system, by ageing, reaches end of lifecycle, the percentage used is 100%.
- For example, a roof that has a 20-year life expectancy, installed in 2013, would be considered 100% used at the end of the year 2033.

FCI – Repair Cost: Degradation Calculation

Calculating Percentage Used

- First calculate the age of the building system

$$systemAge = (currentYear - yearInstalled)$$

- If the age of the building system is greater then the expected lifespan of that system then,

$$percentageUsed = 100\%$$

- If not,

$$percentageUsed = \frac{systemAge}{systemLifespan}$$

Example: B30-Roof (20 year expected lifespan) installed in 2013

$$percentageUsed = \frac{2023 - 2013}{20} = \frac{10}{20} = 50\%$$

FCI – Repair Cost: Renewal Percentage

Renewal Percentage - a multiplier used to adjust the cost of renewing a building system.

- Some building systems cost LESS to renew that to install the first time.
- Some building systems cost MORE to renew that to install for the first time

Examples:

- B30 – Roof: 1.2 – Incurring an additional 20% in repair cost associated with any movement of utilities or additional costs associated with replacing a roof.
- D2010 – Plumbing Fixtures: 1.0 – Simple one-to-one swap, if a plumbing fixture in a bathroom is inoperable. There is no need for any additional cost need to be incurred.

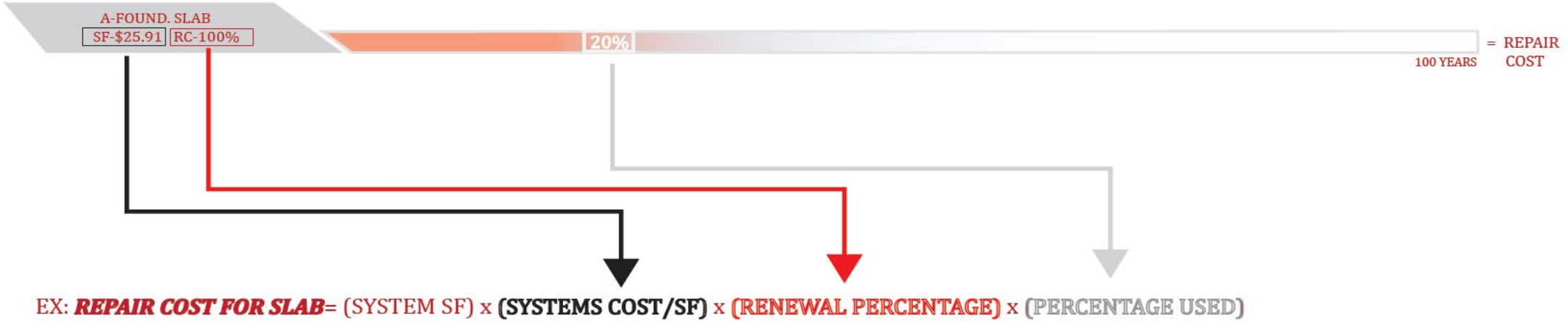
FCI – Repair Cost Calculated

- The FAD takes into consideration a host of different systems that can be present within any given school building
- There are three unique property types that dictate the systems available
  - Permanent
  - Portable
  - Site
- All systems have a unique cost per square foot and renewal percentage with percentage used being based upon current year and year installed
- System info is derived from ASTM UNIFORMAT II Standard E1557

Property Type		
Permanent	Site	Portable
A- Found. Slab	G2020- Parking Lots	F1012-Pre Engineered Structure
B2010 - Exterior Walls	G2030 - Pedestrian Paving	
B2020 - Exterior Windows	G2041 - Fencing/Gates	
B2030 - Exterior Doors	D2047-Play Fields	
B30- Roof	G2052- Basketball Courts	
C10 - Int Door, Part, Stair Elevator	G2053-Running Track	
C1030 - Interior Walls	G2054-Tennis Courts	
C3010 - Wall Finishes	G2050 - Landscaping	
C3020 - Floor Finishes	G2055-Playground Equip	
C3030 - Ceiling Finishes	G3010 - Water Supply	
D2010 - Plumbing Fixtures	G3020-Sanitary Sewer	
D2020 - Water Distribution	G3030 - Storm Sewer	
D2030 - Drain, Waste, Vent	G3052 - Wells Heating / Cooling	
D3020 - Heat Generating Systems	G3060-Fuel Distribution	
D3030 - Cool Generating Systems	G4010 Electrical Distribution	
D3041 - Air Distribution	G4020-Site Lighting	
D3042 - Exhaust Ventilation Equipment	G4090- Other Site Electrical Utilities	
D3050- Rooftop Unitary A/C	G90-Site Specialties	
D3060 - HVAC Controls		
D4010 - Fire Sprinklers		
D5010 - Main Power /Emergency		
D5020 - Lighting/Branch Circuits		
D5037 - Fire Detection/Alarm		
D5038 - Communication / Security		
D5039 – Technology		
D5090 - Other Electrical Systems		
D5092 - Emergency Lighting		
E1020 - Institutional Equipment		
E1090 - Other Equipment		

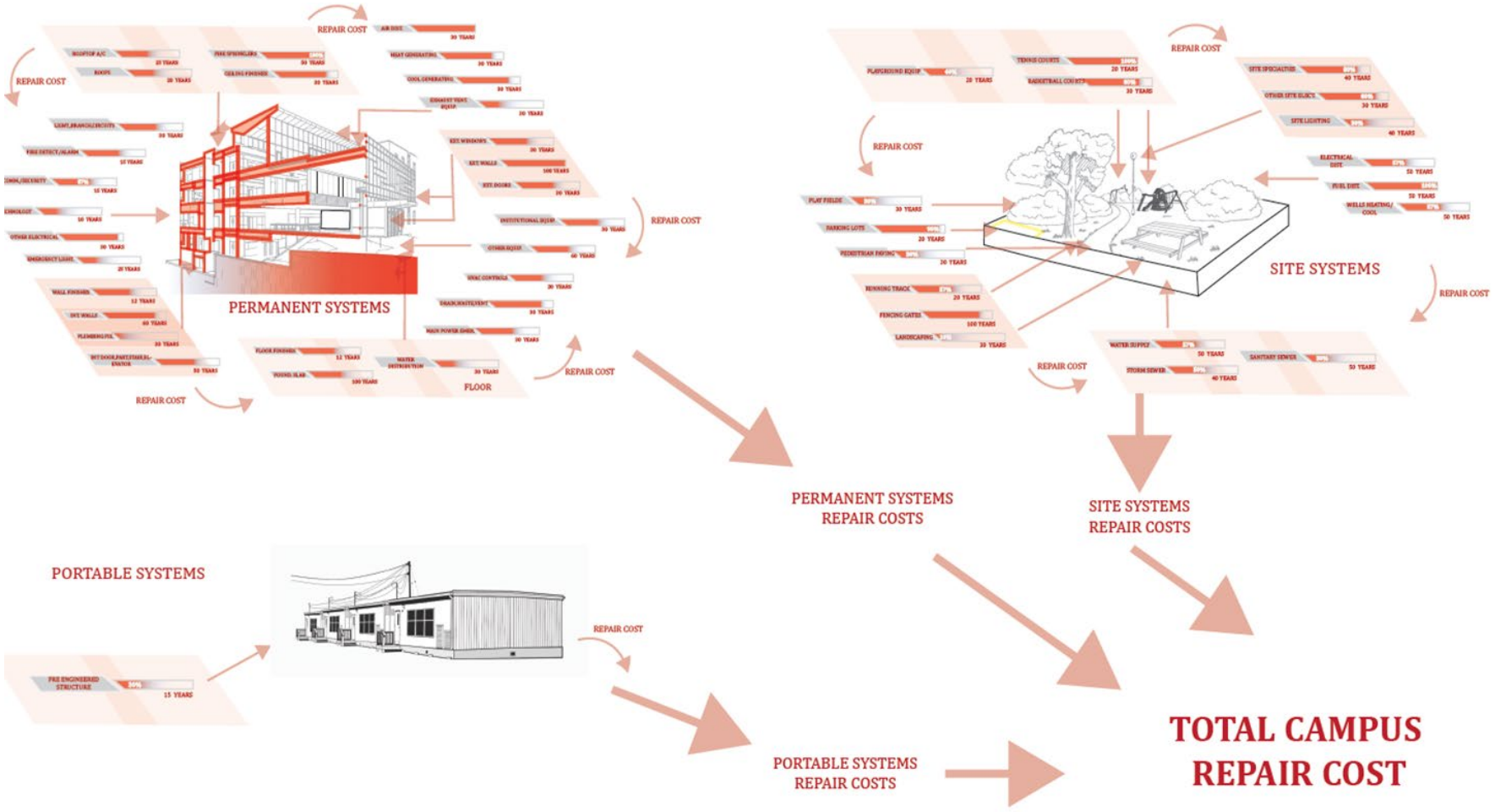
FCI – Repair Cost Calculated Cont.

- Initial repair costs are calculated at the individual property system level
- Needed repairs or repair cost of a property is calculated as follows:
  - For each system present, the size, cost per square foot, renewal percentage and percentage used are all required fields.



- Each individual system repair cost is then aggregated within the property to sum up the entire property repair cost.
- Each properties repair cost is accumulated in the school's total repair cost.

Visualizing Repair Cost Calculation



New Mexico Condition Index (NMCI)

The NMCI is calculated from the base formula for FCI, but also includes the cost to correct deficiencies based on the NM Educational Adequacy Standards

$$\mathrm{N}MCI = \frac{Needed\ Repairs\ (\$) + Cost\ to\ Correct\ NM\ Adequacy\ Standards\ Deficiencies\ (\$)}{Replacement\ Value\ (\$)}$$

New Mexico Educational Adequacy Standards

- The state has set standards that create requirements for spaces deemed necessary for educational delivery.
- An Educational Adequacy (EA) Standard deficiency exists when a facility fails to meet any established State Adequacy Standards.
- Formulas that represent each EA Standard are programed.
- Deficiencies are automatically generated when the school fails to meet the EA standards required.
- Simply put, do you have enough square footage to support the enrollment?

New Mexico Educational Adequacy Standards: Calculations

- EA Standards require a specific amount of space.
- PSFA staff performs site assessment.
- Space utilization from site assessment entered in FAD
- FAD then subtracts required space from actual space measured.
- Result indicates if EA standard not met – if not, a dollar value is generated to be added to the numerator of the NMCI equation

Examples:

- Computer Lab Square Footage:
- GREATEST(700, <<enrollment>> * 3)
- Student Health Square Footage:
- GREATEST(150, <<enrollment>>)
- Physical Education Square Footage (HS):
- (6500 + (<<enrollment>> * 1.5 * 4) + (150 * 2))

Weighted New Mexico Condition Index (wNMCI)

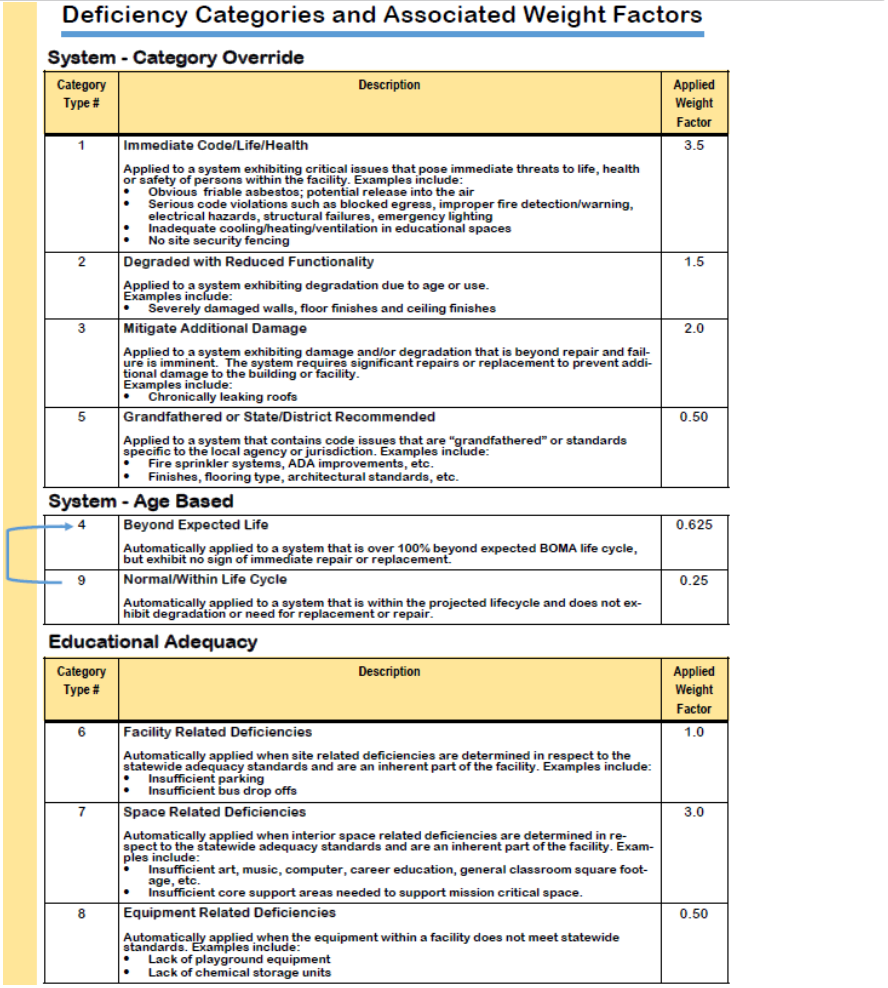
- Recap,

$$\text{NMCI} = \frac{FCI(all\ system Repair\ costs) + EA\ Standards\ Deficiencies(utilization)}{Replacment\ Value\ (maximum\ repair Cost\ of\ all\ systems)}$$

- Next, each deficiency is “weighted” in order to create prioritization
- Systems requiring immediate repair posing a health or safety threat will be weighted at the highest weight of 3.5 to ensure that those schools get treated with the greatest priority

Deficiency Categories and Associated Weight Factors

- Category Type #'s 1,2,3 and 5 are based on assessments / observations of the unique building systems.
- Category Type #'s 4 and 9 are determined automatically within FAD based on the current year and year of installation of the system.
- Category Type #'s 6 ,7 and 8 are associated with the EA ONLY. Determined based on the utilization of the space within the school in respect to the enrollment.



Deficiency Categories and Associated Weight Factors

System - Category Override

Category Type #	Description	Applied Weight Factor
1	**Immediate Code/Life/Health** Applied to a system exhibiting critical issues that pose immediate threats to life, health or safety of persons within the facility. Examples include: • Obvious friable asbestos; potential release into the air • Serious code violations such as blocked egress, improper fire detection/warning, electrical hazards, structural failures, emergency lighting • Inadequate cooling/heating/ventilation in educational spaces • No site security fencing	3.5
2	**Degraded with Reduced Functionality** Applied to a system exhibiting degradation due to age or use. Examples include: • Severely damaged walls, floor finishes and ceiling finishes	1.5
3	**Mitigate Additional Damage** Applied to a system exhibiting damage and/or degradation that is beyond repair and failure is imminent. The system requires significant repairs or replacement to prevent additional damage to the building or facility. Examples include: • Chronically leaking roofs	2.0
5	**Grandfathered or State/District Recommended** Applied to a system that contains code issues that are "grandfathered" or standards specific to the local agency or jurisdiction. Examples include: • Fire sprinkler systems, ADA improvements, etc. • Finishes, flooring type, architectural standards, etc.	0.50

System - Age Based

4	**Beyond Expected Life** Automatically applied to a system that is over 100% beyond expected BOMA life cycle, but exhibit no sign of immediate repair or replacement.	0.625
9	**Normal/Within Life Cycle** Automatically applied to a system that is within the projected lifecycle and does not exhibit degradation or need for replacement or repair.	0.25

Educational Adequacy

Category Type #	Description	Applied Weight Factor
6	**Facility Related Deficiencies** Automatically applied when site related deficiencies are determined in respect to the statewide adequacy standards and are an inherent part of the facility. Examples include: • Insufficient parking • Insufficient bus drop offs	1.0
7	**Space Related Deficiencies** Automatically applied when interior space related deficiencies are determined in respect to the statewide adequacy standards and are an inherent part of the facility. Examples include: • Insufficient art, music, computer, career education, general classroom square footage, etc. • Insufficient core support areas needed to support mission critical space.	3.0
8	**Equipment Related Deficiencies** Automatically applied when the equipment within a facility does not meet statewide standards. Examples include: • Lack of playground equipment • Lack of chemical storage units	0.50

Weighted New Mexico Condition Index (wNMCI) Cont.

$$wNMCI = \frac{\begin{array}{l}Category1\text{-}weightFactor(3.5)(systemsRepairCost) \\ +Category2\text{-}weightFactor(1.5)(systemsRepairCost) \\ +Category3\text{-}weightFactor(2.0)(systemsRepairCost) \\ +Category4\text{-}weightFactor(0.625)(systemsRepairCost) \\ +Category5\text{-}weightFactor(0.5)(systemsRepairCost) \\ +Category9\text{-}weightFactor(0.25)(systemsRepairCost)\end{array} + \begin{array}{l}Category6\text{-}weightFactor(1.0)(EAdeficiencyRepairCost) \\ +Category7\text{-}weightFactor(3.0)(EAdeficiencyRepairCost) \\ +Category8\text{-}weightFactor(0.50)(EAdeficiencyRepairCost)\end{array}}{Replacement\ Value}$$

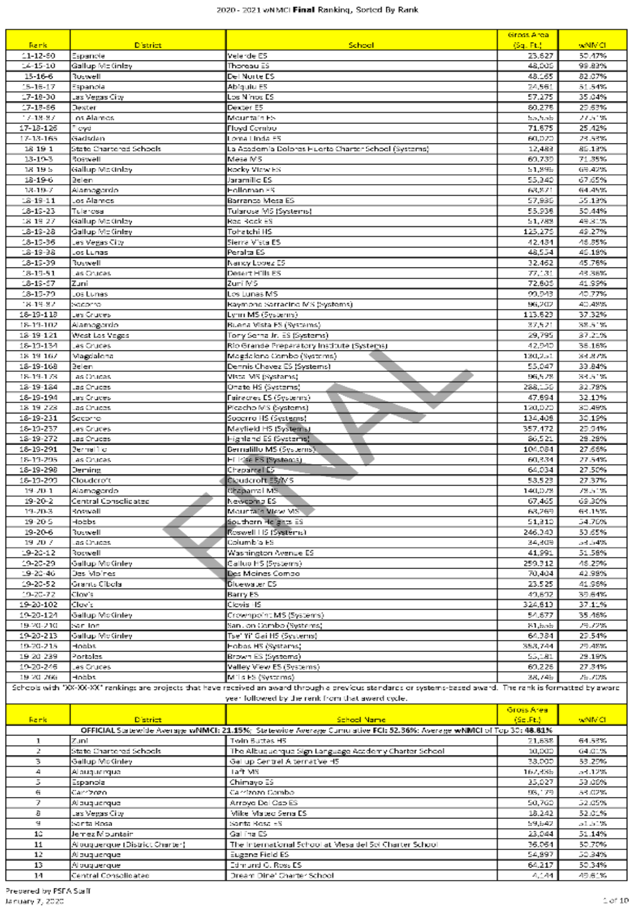
Updating the FAD

The database is continually updated four ways:

- By PSFA staff through on-site assessments.
- By district Facilities Master Plan vendors.
- By school district officials.
- As part of the plan review process in conjunction with the state Construction Industries Division (CID) before construction.

Prioritized Capital Funding

- The wNMCI enables the comparison of all K-12 public schools in the state to determine greatest need for funding the correction of school deficiencies.
- The current FAD dataset is then evaluated against the PSCOC/PSFA defined standards. A report from the FAD is then published yearly.
  - Award criteria is subject to change.
  - Commonly sorted by wNMCI from largest to smallest.



2020 - 2021 wNMCI **Final** Ranking, Sorted By Rank

Rank	District	School	Gross Area (Sq. Ft.)	wNMCI
11-12-60	Espanola	Velarde ES	23,627	50.47%
14-15-10	Gallup McKinley	Thoreau ES	48,006	99.89%
15-16-6	Roswell	Del Norte ES	48,165	82.07%
15-16-17	Espanola	Abiquiu ES	24,561	51.54%
17-18-30	Las Vegas City	Los Ninos ES	57,275	35.04%
17-18-66	Dexter	Dexter ES	60,278	29.63%
17-18-87	Los Alamos	Mountain ES	55,556	27.51%
17-18-126	Floyd	Floyd Combo	71,675	25.42%
17-18-165	Gadsden	Loma Linda ES	60,020	23.58%
18-19-1	State Chartered Schools	La Academia Dolores Huerta Charter School (Systems)	12,488	86.19%
18-19-3	Roswell	Mesa MS	60,739	71.85%
18-19-5	Gallup McKinley	Rocky View ES	51,896	69.42%
18-19-6	Belen	Jaramillo ES	55,340	67.65%
18-19-7	Alamogordo	Holloman ES	68,871	64.45%
18-19-11	Los Alamos	Barranca Mesa ES	57,986	55.19%
18-19-23	Tularosa	Tularosa MS (Systems)	55,938	50.44%
18-19-27	Gallup McKinley	Red Rock ES	51,789	49.31%
18-19-28	Gallup McKinley	Tohatchi HS	125,276	49.27%
18-19-36	Las Vegas City	Sierra Vista ES	42,484	46.85%
18-19-38	Los Lunas	Peralta ES	48,554	46.19%
18-19-39	Roswell	Nancy Lopez ES	32,462	45.76%
18-19-51	Las Cruces	Desert Hills ES	77,131	43.36%
18-19-57	Zuni	Zuni MS	72,606	41.99%
18-19-79	Los Lunas	Los Lunas MS	90,948	40.77%
18-19-87	Socorro	Raymond Sarracino MS (Systems)	96,202	40.48%
18-19-118	Las Cruces	Lynn MS (Systems)	113,623	37.32%
18-19-102	Alamogordo	Buena Vista ES (Systems)	37,571	38.51%
18-19-121	West Las Vegas	Tony Serna Jr. ES (Systems)	29,795	37.21%
18-19-134	Las Cruces	Rio Grande Preparatory Institute (Systems)	42,940	36.16%
18-19-167	Magdalena	Magdalena Combo (Systems)	130,251	33.87%
18-19-168	Belen	Dennis Chavez ES (Systems)	55,047	33.84%
18-19-173	Las Cruces	Vista MS (Systems)	96,578	33.51%
18-19-184	Las Cruces	Onate HS (Systems)	288,136	32.79%
18-19-194	Las Cruces	Fairacres ES (Systems)	47,694	32.10%
18-19-223	Las Cruces	Picacho MS (Systems)	120,020	30.49%
18-19-231	Socorro	Socorro HS (Systems)	134,408	30.19%
18-19-237	Las Cruces	Mayfield HS (Systems)	357,472	29.94%
18-19-272	Las Cruces	Highland ES (Systems)	86,521	28.29%
18-19-291	Bernalillo	Bernalillo MS (Systems)	104,084	27.66%
18-19-295	Las Cruces	Hillrise ES (Systems)	60,334	27.54%
18-19-298	Deming	Chaparral ES	64,034	27.50%
18-19-299	Cloudcroft	Cloudcroft ES/MS	58,528	27.37%
19-20-1	Alamogordo	Chaparral MS	140,079	79.51%
19-20-2	Central Consolidated	Newcomb ES	67,465	69.30%
19-20-3	Roswell	Mountain View MS	68,269	68.15%
19-20-5	Hobbs	Southern Heights ES	51,910	54.70%
19-20-6	Roswell	Roswell HS (Systems)	246,040	53.65%
19-20-7	Las Cruces	Columbia ES	34,909	53.54%
19-20-12	Roswell	Washington Avenue ES	41,991	51.58%
19-20-29	Gallup McKinley	Gallup HS (Systems)	259,312	46.29%
19-20-46	Des Moines	Des Moines Combo	70,404	42.98%
19-20-52	Grants Cibola	Bluewater ES	23,525	41.96%
19-20-72	Clovis	Barry ES	40,632	39.64%
19-20-102	Clovis	Clovis HS	324,613	37.11%
19-20-124	Gallup McKinley	Crownpoint MS (Systems)	54,677	35.46%
19-20-210	San Jon	San Jon Combo (Systems)	81,656	29.72%
19-20-213	Gallup McKinley	Tse' Yi' Gai HS (Systems)	64,384	29.54%
19-20-215	Hobbs	Hobbs HS (Systems)	358,744	29.48%
19-20-239	Portales	Brown ES (Systems)	55,181	28.19%
19-20-246	Las Cruces	Valley View ES (Systems)	60,226	27.84%
19-20-266	Hobbs	Mills ES (Systems)	38,746	26.70%

Schools with "XX-XX-XX" rankings are projects that have received an award through a previous standards or systems-based award. The rank is formatted by award year followed by the rank from that award cycle.

Rank	District	School Name	Gross Area (Sq.Ft.)	wNMCI
OFFICIAL Statewide Average **wNMCI: 21.15%**; Statewide Average Cumulative **FCI: 52.36%**; Average **wNMCI** of Top 30: **48.81%**				
1	Zuni	Twin Buttes HS	21,638	64.58%
2	State Chartered Schools	The Albuquerque Sign Language Academy Charter School	10,000	64.01%
3	Gallup McKinley	Gallup Central Alternative HS	38,000	58.29%
4	Albuquerque	Taft MS	167,836	54.12%
5	Espanola	Chimayo ES	35,027	53.06%
6	Carrizozo	Carrizozo Combo	96,179	53.02%
7	Albuquerque	Arroyo Del Oso ES	50,760	52.05%
8	Las Vegas City	Mike Mateo Sena ES	18,242	52.01%
9	Santa Rosa	Santa Rosa ES	59,642	51.51%
10	Jemez Mountain	Gallina ES	23,044	51.14%
11	Albuquerque (District Charter)	The International School at Mesa del Sol Charter School	36,064	50.70%
12	Albuquerque	Eugene Field ES	54,997	50.34%
13	Albuquerque	Edmund G. Ross ES	64,217	50.34%
14	Central Consolidated	Dream Dine' Charter School	4,144	49.61%

Prepared by PSFA Staff
January 7, 2020

1 of 10

Contact:

Andrew Martinez
Facilities Assessment Database Manager
505-468-0278
amartinez@nmpsfa.org

https://www.nmpsfa.org/

STATE OF NEW MEXICO PUBLIC SCHOOL FACILITIES AUTHORITY

Partnering with New Mexico's communities to provide quality, sustainable school facilities for our students and educators.