2023 PUBLIC EDUCATION METHODOLOGY

The 2023 public education methodology compares the Department of the Air Force (DAF) installations based on the available public education capabilities and offerings from pre-kindergarten through twelfth grade schools. The 2023 methodology evaluates schools that share zip codes with the Military Housing Areas (MHAs) of DAF installations. MHAs are defined as geographic areas in which service members are assumed to look for community housing. Methodology requires that schools also be within a 60-minute drive of a DAF installation. This 60-minute drive time is calculated using the Open Source Routing Machine (OSRM). OSRM is a routing engine run by the National Geospatial Intelligence Agency (NGIA) and calculates the average driving time to a location considering road conditions and speed limits.

CALCULATING SCHOOL SCORES

Before determining an installations overall percentile, a score must first be calculated for each individual school, which is an update to provide more precision to previous methodology which calculated scores at the district level. To determine which schools to use in the calculation, DAF identified two required parameters: 1. schools must share a zip code with the list of MHA zip codes for the installation *and* 2. schools must be within a 60-minute drive of a DAF installation. Each of the schools identified within these parameters are evaluated on the nine education criteria listed in Table 1 on Page 2. These nine criteria make up three larger categories: Academic Performance, Service Offering, and School Climate.

- Academic Performance is comprised of the average of two criteria: Graduation Rates and Student's Average Annual Learning Rate
- School Climate is comprised of the average of two criteria: Chronic Absenteeism Rate and Suspension Rate
- School Service Offerings is comprised of the average of five criteria: Student to Teacher Ratio, Student to Counselor Ratio, Student to Mental Health Support Ratio, Student to Nurse Ratio, and Availability of Free and/or Universal Pre-Kindergarten Score

Next, the percentile ranking of each school is calculated in relation to all other identified schools for each of the nine criteria. A schools percentile rank is a number from 0 to 1, which indicates how a school's performance in each criteria compares to all other schools that have been assessed on the same criteria. For example, if a school's graduation rate is at the 75th percentile (0.75), it means that 75% of schools have lower graduation rates, and 25% of schools have higher graduation rates. The percentile rank calculation is then repeated for each of the remaining eight criteria – Student's Average Annual Learning Rate, Chronic Absenteeism Rate, Suspension Rate, Student to Teacher Ratio, Student to Counselor Ratio, Student to Mental Health Ratio, Student to Nurse Ratio, and Availability of Free and/or Universal Pre-Kindergarten Score.

The percentile ranks for each school are then multiplied by their corresponding weights (identified in Table 1) and added together for all nine criteria to produce the final school score. The weights identified in Table 1 have been predetermined to represent the weight of each category within the final score:

- Academic Performance – 60% of the final score
- School Climate – 20% of the final score
- School Service Offerings – 20% of the final score

This calculation is repeated for each school that meets the zip code and driving distance parameters across all 157 installations to attain a final school score for each school.

2023 PUBLIC EDUCATION METHODOLOGY

Table 1: 2023 Public Education Framework

2023 Public Education Framework			
Category	**Criteria**	**Data Source**	**Weight**
Academic Performance	Graduation Rates	US Department of Education – ED Data Express	30/100
	Student's Average Annual Learning Rate	SEDA	30/100
School Climate	Chronic Absenteeism Rate	US Department of Education – ED Data Express	10/100
	Suspension Rate	US Department of Education – Civil Rights Data Collection	10/100
School Service Offerings	Student to Teacher Ratio	US Department of Education – Civil Rights Data Collection	4/100
	Student to Counselor Ratio	US Department of Education – Civil Rights Data Collection	4/100
	Student to Mental Health Support Ratio	US Department of Education – Civil Rights Data Collection	4/100
	Student to Nurse Ratio	US Department of Education – Civil Rights Data Collection	4/100
	Availability of Free and/or Universal Pre-Kindergarten Score	US Department of Education – Civil Rights Data Collection	4/100

CALCULATING INSTALLATION SCORES AND COMPARING INSTALLATIONS

Once a final school score is determined for all identified schools, an installation score is derived by comparing the school scores within each installation's MHA and 60-minute drive time parameters. The schools are weighted by number of students enrolled, resulting in larger schools having a greater effect on an installations final score. After the schools scores are weighted by enrollment, an average is calculated across all schools within their installation, resulting in the installation score. Finally, DAF takes the overall percentile which is a comparison score between the installation itself and the installation scores of the 157 DAF installations. This overall percentile is presented on the scorecards for each installation.

EDUCATION METHODOLOGY WALKTHROUGH

For an example walkthrough of the education methodology, please see the Appendix on Pages 8-9.

DATA NOTES

Missing values do not actively detract from a school's final score due to the use of weighted averages. For example, only schools that offer grade 12 will have a graduation rate. A school that only offers Kindergarten through 6th grade will not have a graduation rate. Therefore, when calculating their final school score, graduation rates are given a weight of 0 and are not considered in the overall calculation for that specific school. However, if there is a school that offers grade 12 but does not have any graduation rate data within the last four years[1], they will receive a score of zero for graduation rate, which will affect their final school score. For all other data points within the criteria, a masked weighted mean is used, resulting in missing values not actively detracting from a school's final score. For example, if a school is missing data that accounts for 10% of the school score, the average will be calculated from the remaining 90% of the data.

The data integrity is questionable for Chronic Absenteeism and Suspension Rates due to COVID-19 impacts on virtual learning and subsequently data reporting for 2019-2020. Once all Education data is received and analyzed, a final determination to include the data set will be made. This may alter the weighting for each criteria.

[1]Note: the years included in the calculation are 2020-2021, excluding 2019-2020 due to COVID-19.

2023 PUBLIC EDUCATION METHODOLOGY

CRITERIA DEFINITIONS

The definition for each criteria can be found in Table 2 below. The first eight criteria are represented as averages per installation or averages per student. The last criteria, Availability of Free and/or Universal Pre-Kindergarten Score utilizes a different methodology and will be discussed in the next section.

Table 2: 2023 Public Education Criteria Definitions

2023 Public Education Criteria Definitions		
Category	**Criteria**	**Definition**
Academic Performance	Graduation Rates	The average graduation rate for an installation.
	Student's Average Annual Learning Rate	The average student learning rate for an installation.
School Climate	Chronic Absenteeism Rate	The average chronic absenteeism rate for an installation. A chronically absent student is defined as a student who is absent for 10% or more of the school year.
	Suspension Rate	The average suspension rate for an installation. Suspension is defined as the total number of suspended students, not total suspension days.
School Service Offerings	Student to Teacher Ratio	The average number of students per one teacher. For example: a value of 15.43 means for every 15 students, there is one teacher.
	Student to Counselor Ratio	The average number of students per one counselor. For example: a value of 404.21 means for every 404 students, there is one counselor.
	Student to Mental Health Support Ratio	The average number of students per one mental health professional. For example: a value of 954.65 means for every 955 students, there is one mental health professional.
	Student to Nurse Ratio	The average number of students per one nurse. For example: a value of 714.05 means for every 714 students, there is one nurse.
	Availability of Free and/or Universal Pre-Kindergarten Score	A score from zero to 100 given the Pre-Kindergarten availability for an installation.

CALCULATING PRE-KINDERGARTEN AVAILABILITY SCORE

Pre-Kindergarten Availability is represented as a true/false value, therefore a mathematical methodology has been developed to convert the data into numerical scores. The availability of pre-kindergarten is recorded at the district-level using the following five parameters: 1. available to all children, 2. provided for free for full-day schooling, 3. provided for free for part-day schooling, 4. available only to children in Title I schools, or 5. offered (at some capacity). For each school, the corresponding pre-kindergarten information is filled in given the true/false values of their district for each of the five parameters. Point values are assigned to the true/false combinations, represented in Table 3 below.

Table 3: Breakdown of Points Assigned for Each Pre-K Parameter

Breakdown of Points Assigned for Each Parameter	
Parameter	**Points Assigned**
Pre-Kindergarten is available to all children for free for full-day schooling	1 Point (Maximum assigned point value)
Pre-Kindergarten is available to all children for free for part-day schooling	0.5 Points
Pre-Kindergarten is available to children in Title I schools for free for full-day schooling	0.5 Points
Pre-Kindergarten is available to children in Title I schools for free for part-day schooling	0.25 Points
Pre-Kindergarten has an above-zero enrollment or is offered at some capacity	0.25 Points
Pre-Kindergarten has zero enrolled individuals or is identified as not offering Pre-K	0 Points

CALCULATING PRE-KINDERGARTEN AVAILABILITY SCORE CONTINUED

After assigning point values as identified in Table 3, all schools are grouped by district and the maximum pre-kindergarten value is taken for each district. This is done to account for the rare cases where a school may not indicate offering pre-kindergarten, but more than 0 students are still enrolled in pre-kindergarten. Once district values are identified, a pre-kindergarten score is filled in for each school in a district. Next, we filter to the installation level, and take a masked weighted average (the weights are total school enrollment) of all pre-kindergarten scores. These values will be between 0 and 1 and are then scaled out to be between 0 and 100 for representation on the scorecard.

PUBLIC EDUCATION SCORECARD

For each State, a public education scorecard was developed outlining the results of DAF's analysis. Each scorecard includes an installation's:

- Name and location
- Public education overall percentile among the 157 total installations
- Academic Performance category scores
- School Climate category scores
- Service Offering category scores

DATA SOURCES

The 2023 Public Education Methodology utilizes the Data Sources and references in Table 4 below.

Table 4: 2023 Public Education Data Sources

2023 Public Education Data Sources		
Data Source	**Criteria**	**Reference**
Stanford Education Data Archive (SEDA)	Student's Average Annual Learning Rate	https://edopportunity.org/methods
US Department of Ed – ED Data Express	Chronic Absenteeism Rate, Graduation Rate	https://eddataexpress.ed.gov/download
US Department of Education – Civil Rights Data Collection	Suspension Rate, Student to Teacher Ratio, Student to Counselor Ratio, Student to Mental Health Prof. Ratio, Student to Nurse Ratio, Pre-Kindergarten Score	https://ocrdata.ed.gov
Open Source Routing Machine	60-Minute Drive Time from Each DAF Installation	https://project-osrm.org/

2023 STATE LICENSURE PORTABILITY METHODOLOGY

The 2023 SLP methodology was developed in coordination with the Defense State Liaison Office (DSLO) and utilizes their data sources as a foundation to assess a military spouse's ease of licensure portability across State lines. The assessment is broken into two main categories: a State's Statutory Review and Compact Approval. Table 5 shows a breakdown of the categories and respective criteria for assessing a State's licensure portability.

Table 5: 2023 State Licensure Portability Framework

2023 State Licensure Portability Framework		
Category	**Criteria**	**Points Awarded**
Statutory Review	Reciprocal Licensure	25
	Minimal Documentation	25
	Key Occupation Coverage	N/A[2]
Compact Approval	Acceptance of 7 Identified Compacts	50
Total		**100**

STATUTORY REVIEW

To begin, DAF utilized DSLO's statutory reviews of each State to ascertain whether a State:

- Offers a reciprocal license within 30 days of application completion.
- Requires any documents the spouse cannot submit themselves, i.e., requires submission from another institution or organization, such as a transcript or documentation from a State's licensing board.
- Has legislation that covers all 34 of the identified Key Occupations (Table 6).

If a State offers a reciprocal license within 30 days of a spouse's application according to statutes in their legislation, the State will receive 25 points. In addition, if a State only requires minimal documentation to submit an application, meaning, the State does not require documentation that a spouse cannot submit themselves, the State will receive an additional 25 points, for a total of 50 points in the Statutory Review category.

However, there may be some professions excluded or not covered by the legislation that must be considered, and this is what the Key Occupation Coverage criteria takes into account. To assess a State's Key Occupation Coverage, the DAF identified occupations spouses had obtained licenses for based on a report published by the U.S. Department of Homeland Security and the U.S. Department of Defense in 2018.

Table 6: Military Spouse Occupations

Licensed Health Occupations (Accounts for 50% of spouses with licensed jobs)		Licensed Education Occupations (Accounts for 30% of spouses with licensed jobs)	Licensed Additional Occupations (Accounts for 20% of spouses with licensed jobs)	
- AP Registered Nurses - Nurse Practitioners - Physicians - Speech/Language Pathologists - Pharmacists - Dentists - Optometrists - Opticians - Audiologists - Occupational Therapists	- Physical Therapists - Veterinarians - Emergency Medical Services - Radiologists - Surgical Assistants - Psychologists - Acupuncturists - Podiatrists - Pediatricians - Mental Health Counselors	- School Administrators - Teachers	- Architects - Electricians - Engineers - Accountants - Carpenters - Plumbers - Cosmetologists/ Barbers	- Real Estate Agents - General Contractors/ Handymen - Police Officers - Firefighters - Lawyers

[2]Note: for Key Occupation Coverage, a State will lose points in the Statutory Review category if a key occupation is not covered (Table 6). See "Statutory Review" section for more information on scoring.

STATUTORY REVIEW CONTINUED

As a result of the report, DAF determined that health occupations accounted for roughly 50% of spousal licenses, education occupations accounted for 30% and additional occupations accounted for 20%. Within each field, specific occupations were then identified, totaling 34 occupations. More specifically, 20 health occupations, 2 education occupations, and 12 additional occupations were identified (Table 6).

For each of the identified occupations not covered in a State's legislation, the Statutory Review score is reduced by the percent of licensed military spouses that the statute fails to cover. For example, if State X offers a reciprocal license in 30 days with minimal documentation, they receive the full 50 points for Statutory Review. However, State X excludes Teachers and Dentists from this legislation meaning, 95% (19/20) of Health Occupations are covered, 50% (1/2) of Education Occupations are covered, and 100% (12/12) of all Additional Occupations are covered. Each of these percentages are multiplied by their respective weights (as noted above, 50% for Health Occupations, 30% for Education Occupations, and 20% for Additional Occupations) and added together to achieve the overall percent of occupations covered. This percent of occupations covered is then multiplied by the original 50 points offered for reciprocal licensure and minimal documentation to get your final Statutory Review points. Furthermore, if an occupation is not covered in a State's legislation, but is covered by a compact, the State will receive full credit for that occupation in the Statutory Key Occupation Coverage criteria.

COMPACT APPROVAL

In addition to State statutes, DAF evaluates a State's Compact Approval. In other words, which licensure portability compacts the State has passed. For this year's release, DAF selected seven compacts as they were deemed to meet or exceed statutory expectations (Table 7). These seven compacts have already been enacted by multiple States and are fully functional. In future analyses, DAF will determine if there are additional fully functional compacts to add to the analysis that have been recently added to a State's legislative cycle. As of now, DAF has already chosen the Interstate Teacher Mobility Compact (ITMC), the Interstate Medical Licensure Compact (IMLC), the Dentist and Dental Hygienist Compact, and the Cosmetology Compact to be on the next scorecard release.

Table 7: Compacts Included in the 2023 State Licensure Portability Methodology

2023 Compacts
Advanced Practice Registered Nurse (APRN) Compact
Audiology & Speech-Language Pathology Interstate Compact (ASLP-IC)
Counseling Compact
Nurse Licensure Compact (NLC)
Occupational Therapy (OT) Compact
Physical Therapy (PT) Compact
Psychology Interjurisdictional Compact (PSYPACT)[3]

For Compact Approval, if a State has passed all seven compacts, they will receive 50 points, the full amount of points given in this category. However, if a State has a compact that is not passed, the State will lose approximately 7.7 points for each compact they do not have and approximately 3.8 points for PSYPACT[3]. The final evaluation of the two categories (Statutory Review and Compact Approval) for state licensure portability will yield a score out of a total 100 points.

[3]Note: PSYPACT is worth half the points of the other compacts because it enables tele-work with existing clientele after moving to a new State but does not enable a licensed individual to change their practice to one within their destination State.

DEFENSE STATE LIAISON OFFICE (DSLO) PARTNERSHIP

When determining how to assess each State's licensure portability data, DAF decided to leverage an existing data gathering process from DSLO. DSLO's mission is devoted to providing "state policymakers with expert insight on issues affecting military families and their quality of life[4]." DSLO currently employs U.S. Regional Liaisons who are experts in State legislation and policy and who work with policymakers to help make changes to U.S. laws and policies that benefit military families.

In 2021, DAF solidified its partnership and working relationship reducing the reporting and data gathering burden placed on States and government employees, and relying instead on DSLO's legislation experts, while streamlining the data gathering process for both DAF and DSLO.

DAF worked closely with DSLO leadership and Regional Liaisons to determine the criteria needed to analyze the States' SLP score. Once the criteria was determined, the DSLO Regional Liaisons gathered the data from each State and reported it to DAF who calculated each State's SLP score.

STATE LICENSURE PORTABILITY SCORECARD

For each State, a SLP scorecard was developed outlining the result of DAF's analysis. Each scorecard includes:

- The State's name
- A total score out of 50 points for the statutory review
- A number score out of 25 points and color score of red or green for both "Reciprocal Licensure" and "Minimal Documentation"
- A color score of red, yellow, or green for "Statutory Key Occupation Coverage" with the accompanying percentage weights for each category (Health, Education, and Other)
- A total score out of 50 points for "Compact Approval"
- A number score out of 100 points and color score of red, yellow, or green for the "Final Evaluation"
- A map with a color comparison of all the 50 U.S. States

DATA SOURCES

The 2023 State Licensure Methodology utilizes the Data Sources and references in Table 8 below.

Table 8: 2023 State Licensure Portability Compacts

2023 State Licensure Portability Compacts	
Compact	**Reference**
Nurse Licensure Compact (NLC)	https://nursecompact.com/index.page#map
Psychology Interjurisdictional Compact (PSYPACT)	https://psypact.org/mpage/psypactmap
Physical Therapy (PT) Compact	https://ptcompact.org/ptc-states
Audiology & Speech-Language Pathology Interstate Compact (ASLP-IC)	https://aslpcompact.com/compact-map/
Occupational Therapy (OT) Compact	https://otcompact.org/compact-map/
Counseling Compact	https://counselingcompact.org/map/
Advanced Practice Registered Nurse (APRN) Compact	https://aprncompact.com/about.page

[4]Cite: Department of Defense Defense-State Liaison Office website: https://statepolicy.militaryonesource.mil/about

EDUCATION METHODOLOGY WALKTHROUGH

1. Filter Schools

Filter data to include schools that share zip codes with the Military Housing Areas (MHAs) and are within a 60-minute drive of the DAF installation. Below is an example filtered dataset with data for each education criteria.

Table 1: Filtered Schools Example Dataset

Example Filtered Schools Dataset										
Installation	School	Graduation Rate	Average Annual Learning Rate	Chronic Absenteeism Rate	Suspension Rate	Student to Teacher Ratio	Student to Counselor Ratio	Student to Mental Health Prof. Ratio	Student to Nurse Ratio	Pre-Kindergarten Availability
Installation A	School 1	89	0.005408	0.5	0.7	15:1	200:1	982:1	506:1	50
Installation A	School 2	90	0.137845	1	1.2	20:1	206:1	879:1	895:1	28
Installation A	School 3	85	0.022111	2.3	1.9	18:1	189:1	939:1	632:1	43
Installation B	School 4	75	0.090025	0.8	3	22:1	205:1	725:1	781:1	41
Installation B	School 5	92	-0.01437	5	0.7	14:1	306:1	888:1	480:1	42
Installation B	School 6	98	-0.03992	1.2	3	18:1	250:1	950:1	500:1	70

2. Calculate Percentile Rank

Using the example dataset, calculate the percentile rank within each of the nine criteria (column).

Table 2: Percentile Rank of Each Criteria

Percentile Rank of Each Criteria										
Installation	School	Graduation Rate	Average Annual Learning Rate	Chronic Absenteeism Rate	Suspension Rate	Student to Teacher Ratio	Student to Counselor Ratio	Student to Mental Health Prof. Ratio	Student to Nurse Ratio	Pre-Kindergarten Availability
Installation A	School 1	0.5	0.5	1	1	0.833333	0.833333	0.166667	0.666667	0.833333
Installation A	School 2	0.666666667	1	0.666667	0.666667	0.333333	0.5	0.833333	0.166667	0.166667
Installation A	School 3	0.333333333	0.666667	0.333333	0.5	0.666667	1	0.5	0.5	0.666667
Installation B	School 4	0.166666667	0.833333	0.833333	0.333333	0.166667	0.666667	1	0.333333	0.333333
Installation B	School 5	0.833333333	0.333333	0.166667	1	1	0.166667	0.666667	1	0.5
Installation B	School 6	1	0.166667	0.5	0.333333	0.666667	0.333333	0.333333	0.833333	1

3. Weight Percentile Ranks

The percentile ranks are then multiplied by its criteria's associated weight. For example, School 1 has a graduation rate of 0.5 and graduation rate has an overall weight of 30/100 (weights are listed below each criteria in Table 11). Multiplying 0.5 x (30/100), the weighted percentile is calculated to be 0.15 for School 1. This is repeated for all schools across the nine criteria.

Table 3: Percentile Rank of Each Criteria Weighted

Percentile Rank of Each Criteria Weighted										
Installation	School	Graduation Rate (30/100)	Average Annual Learning Rate (30/100)	Chronic Absenteeism Rate (10/100)	Suspension Rate (10/100)	Student to Teacher Ratio (4/100)	Student to Counselor Ratio (4/100)	Student to Mental Health Prof. Ratio (4/100)	Student to Nurse Ratio (4/100)	Pre-Kindergarten Availability (4/100)
Installation A	School 1	0.15	0.15	0.1	0.1	0.033333	0.033333	0.006667	0.026667	0.033333
Installation A	School 2	0.2	0.3	0.066667	0.066667	0.013333	0.02	0.033333	0.006667	0.006667
Installation A	School 3	0.1	0.2	0.033333	0.05	0.026667	0.04	0.02	0.02	0.026667
Installation B	School 4	0.05	0.25	0.083333	0.033333	0.006667	0.026667	0.04	0.013333	0.013333
Installation B	School 5	0.25	0.1	0.016667	0.1	0.04	0.006667	0.026667	0.04	0.02
Installation B	School 6	0.3	0.05	0.05	0.033333	0.026667	0.013333	0.013333	0.033333	0.04

4. Add Criteria Columns & Final School Score

Finally, add across the rows of each school to get a final school score.

Table 4: Final School Scores

Final School Scores																				
Installation	School	Graduation Rate		Average Annual Learning Rate		Chronic Absenteeism Rate		Suspension Rate		Student to Teacher Ratio		Student to Counselor Ratio		Student to Mental Health Prof. Ratio		Student to Nurse Ratio		Pre-Kindergarten Availability		Final School Score
Installation A	School 1	0.15	+	0.15	+	0.1	+	0.1	+	0.033333	+	0.033333	+	0.006667	+	0.026667	+	0.033333	=	0.633333
Installation A	School 2	0.2	+	0.3	+	0.066667	+	0.066667	+	0.013333	+	0.02	+	0.033333	+	0.006667	+	0.006667	=	0.713333
Installation A	School 3	0.1	+	0.2	+	0.033333	+	0.05	+	0.026667	+	0.04	+	0.02	+	0.02	+	0.026667	=	0.516667
Installation B	School 4	0.05	+	0.25	+	0.083333	+	0.033333	+	0.006667	+	0.026667	+	0.04	+	0.013333	+	0.013333	=	0.516667
Installation B	School 5	0.25	+	0.1	+	0.016667	+	0.1	+	0.04	+	0.006667	+	0.026667	+	0.04	+	0.02	=	0.6
Installation B	School 6	0.3	+	0.05	+	0.05	+	0.033333	+	0.026667	+	0.013333	+	0.013333	+	0.033333	+	0.04	=	0.56

5. Calculating an Installation Score

Once a final school score is calculated, an installation score is derived by comparing the school scores within each installation's MHA and 60-minute drive time parameter. In this example, Schools 1, 2, and 3 will be weighted by number of students enrolled and an average will be calculated for Installation A. Schools 4, 5 and 6 will likewise be weighted by number of students enrolled to calculate an average for Installation B.

6. Overall Percentile – Presented on Scorecard

Finally, DAF takes the overall percentile which is a comparison score between the installation itself and the installation scores of the 157 DAF installations. This overall percentile is presented on the scorecards for each installation.