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A REPORT ON SPACE ALLOCATION.

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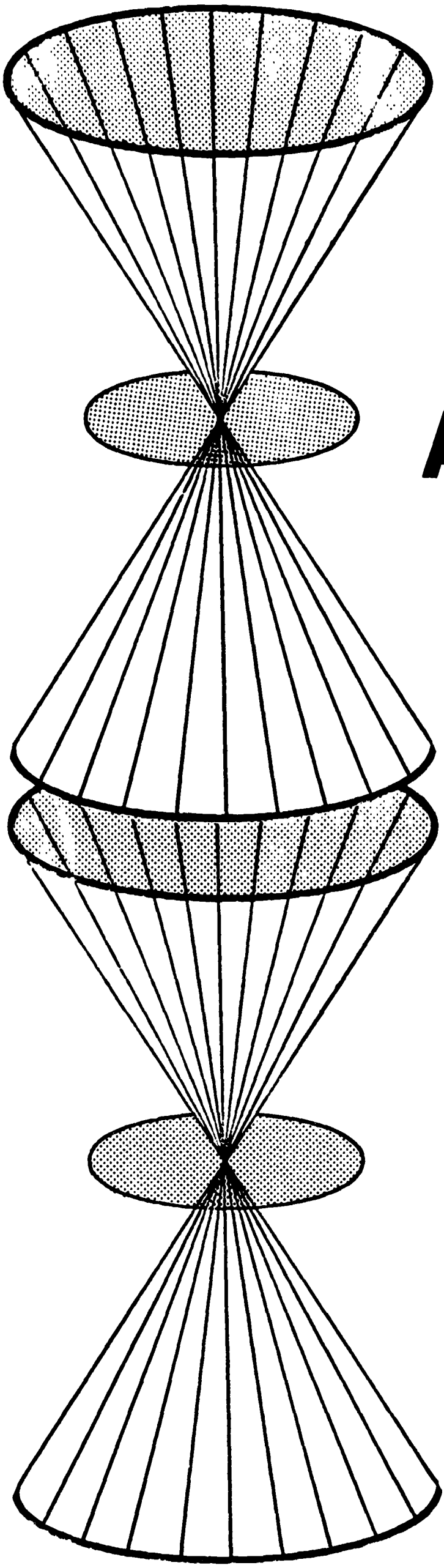
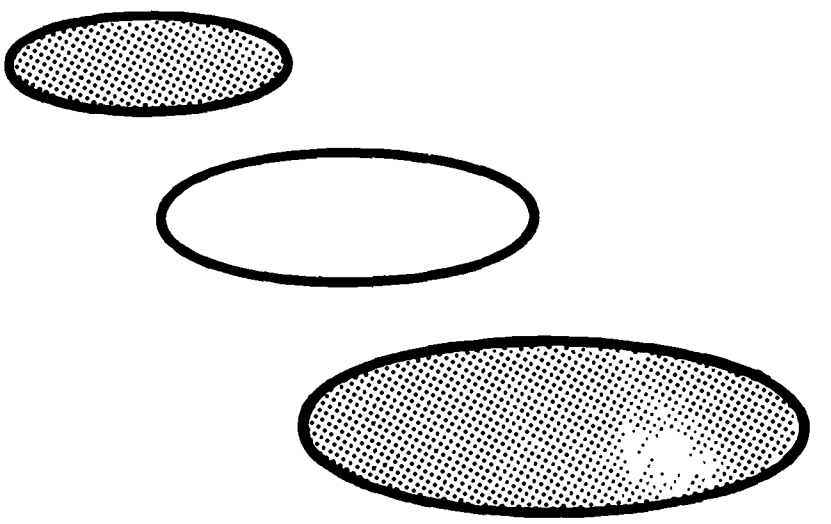
THE SQUARE FOOT STANDARDS PER PUPIL FOR SCHOOLS IS ANALYZED. THE SQUARE FOOT ALLOCATIONS FOR SEVERAL STATES AND PHILADELPHIA ARE DETERMINED BY DIVIDING THE TOTAL SQUARE FOOTAGE OF THE SCHOOL BY THE NUMBER OF STUDENTS THE SCHOOL IS INTENDED TO ACCOMMODATE. TABLES SHOWING STATE RECOMMENDATIONS OR REQUIREMENTS FOR THE ELEMENTARY, MIDDLE-JUNIOR HIGH, AND HIGH SCHOOL BUILDINGS ARE GIVEN. DISTINCTIONS BETWEEN STATES WITH SEVERE WEATHER AND MILD WEATHER ARE MADE. DIFFICULTY IN COMPARING SQUARE FOOTAGE ALLOCATIONS CAN BE ATTRIBUTED TO SUCH VARIABLE FACTORS AS--(1) BUILDING CODES, (2) BUILDING SITES, (3) GEOGRAPHIC DIFFERENCES, (4) CLIMATIC DIFFERENCES, (5) AVAILABILITY OF FUNDS, (6) SINGLE AS OPPOSED TO MULTI-STORY CONSTRUCTION, (7) COURSE OFFERINGS OF THE EDUCATIONAL PROGRAM, AND (8) EXTENT OF SPACE UTILIZATION THROUGH CLASS SCHEDULING. (BD)



a report on SPACE ALLOCATIONS



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AUGUST, 1967

A REPORT ON

SPACE ALLOCATION

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ANALYSIS OF SQUARE FOOTAGE STANDARDS

Introduction

The purpose of this analysis is to provide data against which the relative sizes of public schools in Philadelphia can be compared. The common denominator used here is square footage allocation per pupil. This denominator is reached by dividing the total square footage of the school by the number of students the school is intended to accommodate.

Comparison With States

In order to obtain data relative to what other states and regions were allocating for per pupil space for elementary, middle, and high school, the State Departments of Education in all states were surveyed. A survey instrument was developed which sought responses from proper state officials relative to suggested or mandatory square feet per pupil allocations. Forty-nine survey instruments were mailed out. The State of Pennsylvania did not receive a survey because the data was available in the School District. Although a total of thirty-five states responded, only fifteen of these responses were useable in this study. Five responses were not useable because they contained no information. The information contained on twenty other replies and that available for Pennsylvania, dealt with square footage per classroom rather than with square footage allocations per pupil for an entire school. Therefore, the data in these responses did not reflect space requirements for non-classroom areas.

Table I presents, in tabular form, the data that were obtained through the survey instrument from the fifteen states which provided relevant information. Inspection of the Table reveals a variance of 31 square feet per pupil allocation in the amount of square feet recommended or required by states in

TABLE I

STATE SPACE ALLOCATIONS

STATE	ELEMENTARY	MIDDLE	HIGH
Arizona	60		90
California	55	75	80
Connecticut	70		113
Delaware	74.9	137.41	150.02
Georgia	65		85
Maine	65	85	125
Michigan	62.4	106.2	174.9
Mississippi	65	75	85
Missouri	60	90	120
Nevada	54	84	120
New Jersey	70	100	135
New York	85	100	125
South Dakota	65	110	125
Virginia	70	100	125
Washington	70	90	110

elementary school facilities. The range of allocations for the elementary school is from a low of 54 square feet per pupil in Nevada to a high of 85 square feet per child in New York. For the middle school the range is from a low of 75 square feet recommended by California to a high of 137.41 square feet recommended by Delaware. For the high school the range extends from a low of 80 square feet per pupil recommended by California to a high of 174.9 recommended by Michigan. Eleven of the fifteen states represented on Table I recommend or require a space allocation of 110 or more square feet for the high school student. Six of these eleven states are located on, or very near to, the Eastern Seaboard.

Table II restructures, in tabular form, the fifteen states shown on Table I. The four states with less than 100 square feet allocated per high school student are shown as one group, while the eleven states with more than 100 square feet allocated per high school student are shown as another group. Although the number of states represented on this Table is not large, the breakdown indicates a tendency for states with mild winters to allocate fewer square feet per high school student than do those states with more severe winters.

When the relationship of climate to square footage allocation per pupil is applied to the middle school the tendency remains for states with mild climates to allocate fewer square feet per pupil. Even though, only two of the four warm-winter states reported space allocations for the middle school, they both reported 75 square feet per pupil allocation which is 9 square feet less than reported by any of the schools in the other group. It is only reasonable to expect that schools in areas of the country that have mild winters will allocate less space per pupil since open corridors

TABLE II

STATE SPACE ALLOCATIONS GROUPED BY CLIMATIC CONDITIONS

MILD WINTERS

STATE	ELEMENTARY	MIDDLE	HIGH
Arizona	60		90
California	55	75	80
Georgia	65		85
Mississippi	65	75	85

MORE SEVERE WINTERS

STATE	ELEMENTARY	MIDDLE	HIGH
Connecticut	70		113
Delaware	74.9	137.41	150.02
Maine	65	85	125
Michigan	62.4	106.2	174.9
Missouri	60	90	120
Nevada	54	84	120
New Jersey	70	100	135
New York	85	100	125
Philadelphia	93	113	116
South Dakota	65	110	125
Virginia	70	100	125
Washington	70	90	110

can accommodate student traffic. Therefore, space allocations in the Philadelphia Public Schools can best be compared with schools in states with similar climatic conditions. *However, consideration should be given to the possibility of reducing square footage requirements in schools to be constructed by the district through the effective utilization of space in those schools. (See Space Utilization document).*

In the elementary group, the square footage allocation per pupil in the warm-winter group ranges from 55 to 65 square feet per pupil allocation. The range of the colder-winter group is from 54 to 85 square feet. The tendency to suggest or require fewer square feet where winters are not too severe continues at the elementary level. However, this tendency is not as pronounced on Table II as with the middle school and the high school.

A comparison of data presented in Table II with the space allocations set by the School District of Philadelphia reveals the following information:

High School - The 116 square feet allocated by Philadelphia Public Schools ranks within the eleven states allocating 110 or more square feet per student, but it ranks near the bottom of this group. Only two of the eleven rank lower. These states are Connecticut with 113 square feet and Washington with 110.

Middle School - Delaware, with a space allocation of 137.41 square feet, is the only state on Table II that equals or exceeds the 113 square feet allocated by Philadelphia for the middle school.

Elementary School - The 93 square foot allocation of Philadelphia is 8 square feet more than New York, the next highest allocation on the table.

Comparison With Exhibit Schools for 1966

Tables I and II provide information for comparing space allocated for public schools in Philadelphia with recommended and required allocations in various states. Table III offers data for a different comparison.

Table III presents data obtained from the National Council on Schoolhouse Construction for the exhibit schools for 1966. The table also shows a comparison of this data with the square footage allotments for the Philadelphia Public Schools. Analysis of the table provides the following information:

High School - The Philadelphia allocation of 116 square feet for the high school is below the "average" of exhibit high schools, but it is more than 14 square feet greater than the "low" allocation for the exhibit high schools.

Middle Schools - The Philadelphia middle school square footage allocation is 2.5 square feet higher than the 110.5 "high" for exhibit middle schools.

Elementary Schools - The Philadelphia square footage allocment for elementary schools is only 1.61 square feet less than the "high" for exhibit elementary schools.

When compared with the exhibit schools on Table III, the Philadelphia public elementary and middle school square footage allocations are comparable to the "high" allocations of the exhibit schools. The one education level where the allocation for Philadelphia is below the "average" exhibit school allotment is the high school.

TABLE III

COMPARISON BETWEEN LOW, HIGH, AND AVERAGE SQUARE FOOTAGE PER PUPIL OF NATIONAL COUNCIL ON SCHOOLHOUSE CONSTRUCTION EXHIBIT SCHOOLS AND SQUARE FOOTAGE PER PUPIL FOR PHILADELPHIA

FACILITY	LOW	HIGH	AVERAGE	PHILA.
Elementary	57.51	94.61	70.38	93
Junior High	88.00	128.28	108.14	
Intermediate-Middle	72.94	110.50	87.56	113
High School	101.44	148.33	126.33	116

Variable Factors in Square Footage Comparisons

Several variable factors contribute to difficulty in comparing square footage allocations between schools of different states, counties, districts, and even within the same district. These variables include building codes, building sites, geographic differences, climatic differences, availability of funds, single as opposed to multi-story construction, course offerings of the educational program, and extent of space utilization through class scheduling. Each of these variable factors must be known and considered in comparing square footage allocations, before such a comparison can be fully meaningful.

Tables I, II, and III contain the data on square footage per pupil collected from three surrounding counties in the Philadelphia suburbs. Table IV presents a comparison between the square footage of each of the three counties and the Philadelphia square footage allocation.

Using the mean square footage in each county, the Philadelphia square footage per pupil allocation is 15 square feet more on the elementary level, 5 square feet more on the junior high level, and 4 square feet less on the senior high level in Delaware County. In Chester County, the Philadelphia square footage per pupil allocation is 14 square feet more on the elementary level, 12 square feet more on the junior high level, and 2 square feet less on the senior high level. In Montgomery County, the Philadelphia square footage per pupil allocation is 21 square feet more on the elementary level, 17 square feet less on the junior high level, and 50 square feet less on the senior high level.

In summary, the mean for the three suburban counties is 76 square feet on the elementary level, 113 square feet on the junior high level, and 168 square feet on the senior high level. This indicates that the Philadelphia allocation has an additional 17 square feet for each elementary pupil, is exactly even with the three suburban counties on the junior high level, and needs an additional 52 square feet on the senior high level to be comparable with the suburban senior high schools.

Several variable factors present difficulties in comparing square footage allocations between Philadelphia and the schools of the three suburban counties. These factors include size of auditorium, cafeteria, social activity areas, and swimming pool. Also included in these factors are building codes, building sites, geographic differences, climatic differences, availability of funds, single as opposed to multi-story construction, course offerings of the educational program and extent of space utilization through class scheduling. Each of

these variable factors must be known and considered in comparing square footage allocation before such a comparison can be fully meaningful.

TABLE IV

SCHOOL	DELAWARE COUNTY TOTAL SQUARE FOOTAGE OF BUILDING ARCHITECTURAL AREA			SQUARE FOOTAGE PER PUPIL	REIMBURSEABLE STUDENT CAPACITY	GRADE LEVEL
	Elementary	Jr. High	Senior High			
Toby Farms Elem. School - Chester Township, Pa.	30,500			62.25	490	K - 6
Lakeview Elem. School - Ridley Park, Penna.	64,371			65.6	980	K - 6
Ithan Elem. School * Ithan, Penna.	66,300			92.0	720	K - 6
Tinicum Elem. School Lester, Penna.	55,400			98.0	565	K - 6
Paxon Hollow Jr. High School - Marple Township, Penna.		92,330		108.6	850	6 - 9
Sun Valley High School Brookhaven, Penna.			111,500	90.4	1,233	10 - 12
Brookhaven Jr. High School - Brookhaven, Penna.		91,300		106.6	856	7 - 9
Pennerest High School Middletown Township, Penna.			151,050	151.0	1,000	9 - 12
Riddlewood Elem. School - Middletown, Penna.	31,550			73.5	429	K - 6

SQUARE FOOTAGE MEAN =	5-Elem	2-Jr. High	2-Sr. High
	78	108	120

TABLE V

SCHOOL	CHESTER COUNTY TOTAL SQUARE FOOTAGE OF BUILDING ARCHITECTURAL AREA			SQUARE FOOTAGE PER PUPIL	REIMBURSEABLE STUDENT CAPACITY	GRADE LEVEL
	Elementary	Jr. High	Senior High			
Pennwood Elem. School - Westtown, Penna.	33,500			93.0	360	K - 6
Beaumont Elem. School - Berwyn, Penna.	43,610			109.0	400	K - 6
Coatesville Area Sr. High School Coatesville, Penna.			200,817	118	1,702	11 - 12
West Bradford Elem. School - Bradford, Penna.	49,095			66.8	735	K - 6
Octorara Area Intermediate School Atglen, R.D. i, Penna.		98,500		98.8	997	6 - 8
Owen J. Roberts Middle School - R.D. 1, Pottstown, Penna.		189,215		107.5	1,761	6 - 8
Oxford Area Intermediate - Oxford, Penna.		70,000		95.8	730	6 - 8
Schylkill Elem. School - Schylkill Township, Penna.	46,000			69.2	665	4 - 5 - 6
Glen Acres Elem. School - West Goshen, Pa.	46,185			75.0	615	K - 6
Pickering Valley Elem. School - Upper Uwchlan Twp., Pa.	29,724			60.7	490	K - 6
SQUARE FOOTAGE MEAN =	6-Elementary	3-Jr. High	1-Sr. High			
	78.6	101	118			

TABLE VI

MONTGOMERY COUNTY

SCHOOL	TOTAL SQUARE FOOTAGE OF BUILDING ARCHITECTURAL AREA			SQUARE FOOTAGE PER PUPIL	REIMBURSEABLE STUDENT CAPACITY	GRADE LEVEL
	Elementary	Jr. High	Senior High			
Green Meadow Elem. School - Abington Twp., Pa.	60,124			68.75	875	K - 6
Plymouth Jr. High School Plymouth Twp., Pa.		185,000		139.8	1,323	7 - 9
Whitemarsh Jr. High School Plymouth Meeting, Pa.		164,000		120.7	1,360	7 - 9
Blair Mill Rd. Elem. School Hatboro, Pa.	59,500			77.3	770	K - 6
Hallowell Elem. School Horsham Twp., Pa.	30,133			65.25	462	1 - 6
Narbeth Elem. School Narbeth, Pa.	34,900			78.25	446	K - 6
Lower Moreland Senior High Lower Moreland Twp., Pa.			118,000	165.7	712	9 - 12

SQUARE FOOTAGE MEAN =	4 - Elementary	2 - Jr. High	1 - Senior High
	72	130	166

TABLE VII

COMPARISON BETWEEN LOW, HIGH, AND AVERAGE SQUARE FOOTAGE PER PUPIL IN DELAWARE, CHESTER, AND MONTGOMERY COUNTIES VS. PHILADELPHIA

		LOW	MEAN	HIGH	PHILADELPHIA	MEAN DEVIATION
Delaware	Elementary	62.2	78	98	93	+ 15
	Junior High	106.6	108	108.6	113	+ 5
	Senior High	90.4	120	151	116	- 4
Chester	Elementary	60.7	79	109	93	+ 14
	Junior High	95.8	101	107.5	113	+ 12
	Senior High	118	118	118	116	- 2
Montgomery	Elementary	65.2	72	78.2	93	+ 21
	Junior High	120.7	130	139.8	113	- 17
	Senior High	165.7	166	165.7	116	- 50