Facility Study for the

Shaler Area School District

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INTRODUCTION

The Shaler Area School District lies astride PA Route 8 as it crosses the Ohio River traveling north from Pittsburgh. "*Providing a Dynamic Learning Environment to the Communities of Etna, Millvale, Reserve and Shaler*", the School Board of Directors commissioned this study to evaluate existing building conditions and provide options for the potential reconfiguration of the District's primary and elementary schools.

The study data was accumulated through staff investigation and research, interviews with District staff and Administrators, and the District web site at www.sasd.k-12.pa.us. The study is organized to provide the following information:

- Enrollment Projections and Building Capacities
- Building Evaluations
- Construction Options and Budgets

A team of Architects and Engineers from HHSDR have toured each building with District staff. We have reviewed the facilities and compared their condition against present-day building codes and regulations, educational guidelines and operational needs. The team also met with the Administrators to obtain their perspective and better understand the future educational goals of the District.

Comparisons of enrollments versus building capacities were made to determine space adequacy. This analysis also includes a preliminary determination of state reimbursement and financing requirements.

AUTHORS' CREDENTIALS

The study has been prepared by HHSDR Architects / Engineers of Sharon and Pittsburgh, Pennsylvania. Over the past 60 years, HHSDR has served as the Architect for many school districts across the state. It has performed services on a wide range of construction projects, and has completed facility studies for hundreds of educational buildings in the Commonwealth.

The professionals* who prepared the study are:

Mr. J. Greer Hayden, RA, PE, CEFPI, NCARB, President
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NCARB - National Council of Architectural Review Boards LEED-AP - Leadership in Energy and Environmental Design Accredited Professional for Building Design and Construction
M.Ed. - Master of Education
RSBA - Registered School Business Administrator

METHODOLOGY

The format of this analysis and report follows Pennsylvania Department of Education guidelines for facility studies. The District's buildings have been analyzed by Architects and Engineers using PDE standards and guidelines for determining building capacities, educational programs and condition of major components. Prevailing standards and codes were utilized to evaluate components such as soundness of structure, building envelope, heating / plumbing / electrical systems, physical accessibility, asbestos containing materials and energy efficiency. The present building conditions were rated on the basis of excellent, good, fair or poor.

Enrollment projections prepared by the Pennsylvania Department of Education were reviewed and compared to the current enrollment figures provided by the District. A separate demographic analysis was also conducted for this study.

Proposed building reconfiguration solutions are presented in conceptual and programmatic form. The proposed solutions show space allocations necessary for construction and renovation priorities identified by the Board and Administration. The financial impact on the District is shown using current construction costs, which are unit costs based upon industry indices. Escalation of costs into the future has not been projected.

SUMMARY OF FINDINGS

The Shaler Area School District operates five (5) K - 3 Primary Schools, one (1) 4-6 Elementary School, one (1) 7-8 Middle School and one (1) 9-12 High School. The District Offices are housed at the Middle School, and its Buildings and Grounds warehouse and offices are off-site from the school campus locations.

The school buildings are generally located in residential settings; pupils are bused to and from school each day. The High School and Middle School are in very good overall condition, while the Elementary Schools vary from fair to poor physical condition. All the buildings are well maintained from an operational standpoint.

The Elementary Facilities are small and restrictive in terms of providing adequate educational programs to meet current standards and requirements for special education, art, music, physical education and technology, etc. Excess space also exists in several schools, which could provide an opportunity for consolidation of facilities to take advantage of reduced maintenance and staffing. The HVAC, plumbing, electrical, and kitchen equipment are aging.

Shaler Area High School was built in 1979. Both it and the Middle School were renovated in 2008 as part of a grade reconfiguration which moved the 9th Grade to the High School. These buildings and grade levels are not the focus of this study.

District enrollments are generally stable. The most recent PDE projections (2011) indicate that by the 2020-2021 academic year, Shaler Area will be educating 4,634 students. Stewman Demographics projects enrollment at that time to be 4,834 (Scenario III).

Educational criteria such as grade alignment, special education programs and class size philosophy need to be the determining factors on the selection of the most suitable option for the School District.

The Shaler Area School District (SASD) educates 4,611 students (2013-2014 school year) residing in the North Hills communities of Etna Borough, Millvale Borough, Reserve Township and Shaler Township. The District covers a land area of just over 14 square miles, home to 39,285 residents. SASD is a member of Allegheny Intermediate Unit 3 in Homestead, which services all Allegheny County school districts except the Pittsburgh Public Schools. Career and Technical Education is provided by AW Beattie Career Center in McCandless.

Shaler Area's human resources include a staff of 398 classroom teachers and 193 support personnel, including instructional aides, administrative support, library/media staff, and all other classifications including bus drivers and food service workers.

Community Population:

This table summarizes overall population totals by community for Census years 2000 and 2010, and also lists Census estimates for 2012, where applicable.

	2000	2010	%	2012 Estimate
Etna Borough	3,924	3,451	-12.0	3,442
Millvale Borough	4,028	3,744	-7.0	3,735
Reserve Township	3,856	3,333	-13.5	Not Available
Shaler Township	29,757	28,757	-3.0	for These Municipalities
Total SASD	41,565	39,285	-5.5	

SOURCE: www.census.gov (Population Finder for 2010 data, American Fact Finder for 2000 data and the 2012 estimate)

Other demographic data describing the Shaler Area School District includes the following economic and household data, based on survey data taken in 2011, from City-Data.com (www.city-data.com):

- Estimated median household income ranges from $33,877 to $64,510.
- Estimated per capita income ranges from $21,469 to $31,416.
  (Note: the US Census Bureau defines "per-capita income" as the average obtained by dividing aggregate income by total population of an area).
- Estimated median house or condo value ranges from $68,094 to $148,054.
- Most common industries by percentage employment (2005-2009 data): manufacturing; construction; laborers and materials distribution; administrative/support and waste management services; finance/insurance/real estate; health care/social assistance; and retail trade.

The PA Department of Education's (PDE's) 2010-2012 PlanCon Manual ranks Shaler Area in the middle range percentage of state assistance with a Market Value Aid Ratio of .6610 for the 2013-2014 year.

Financing:

Since the District is comprised of four municipalities, it is useful to review property valuation and the amount of tax revenue generated by each member municipality.

As explained by PDE, the Real Estate Tax is levied on the assessed value of land and buildings owned by individuals and businesses. The Allegheny County Office of Property Assessment (ACOPA) appraises each property at market value, and then applies a predetermined assessment ratio. A uniform tax millage rate is then levied by the District against the value of each property. One mill is equal to $1 of tax for each $1,000 of value (for example, in Shaler Township, $20.76 per $1,000 valuation). Therefore, the millage rate multiplied by the sum of the values of all properties (the District's total assessed valuation) produces the potential tax revenue.

This table uses 2013 Assessed Valuation data, including the current school district millage of 20.76. To arrive at the Total Potential Revenue, the Assessed Value is multiplied by .02076. Assessed Value is updated by the ACOPA. The total District Potential Revenue of $2,101,631,399 is divided by 20.76 mills, giving $101,234,653 as the total value of one mil generated in the District.

	12/13/2013 Taxable Assessed Value	2013 School Millage	Total Potential Revenue Generated
Etna Borough	$115,879,220	20.76	$2,405,653
Millvale Borough	$93,930,429	20.76	$1,949,996
Reserve Township	$156,580,000	20.76	$3,250,601
Shaler Township	$1,735,241,750	20.76	$36,023,619
TOTAL SASD	**$2,101,631,399**		**$43,629,869**

SOURCE: Allegheny County (www.alleghenycounty.us)

The 2013-2014 School District Budget of $74,040,954 projects revenues as shown below. Expenditures are comprised of 17 line items. The District assumes a 94% collection rate in its budget calculations.

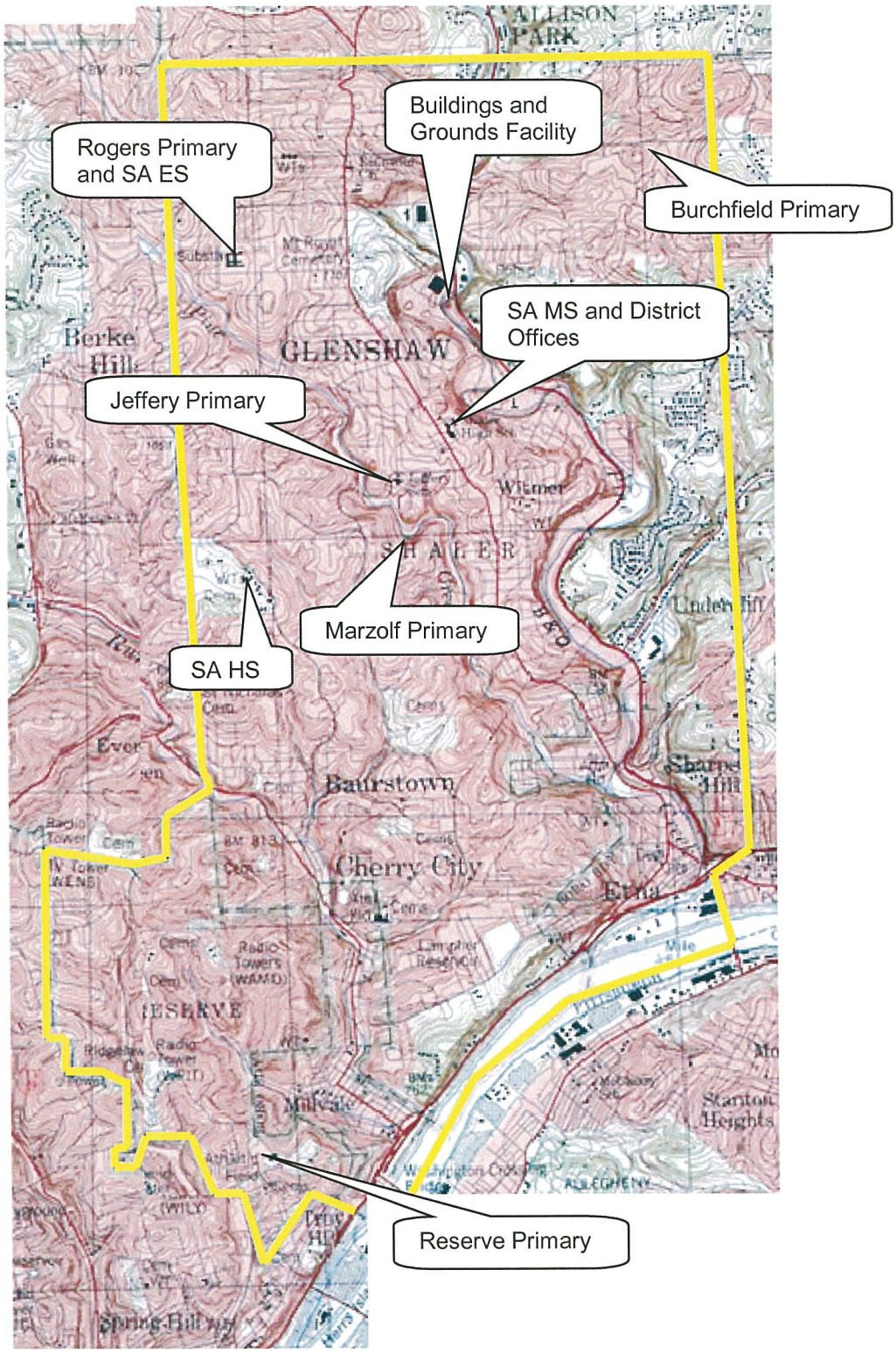
Local Revenue Sources	$46,909,512
State Sources	$23,715,737
Federal Sources	$ 1,259,062
Fund Balance	$ 2,156,643

School District Map:

The following pages contains a map of the Shaler Area School District. Due to the size and shape of the map, it had to be displayed on two pages, along with an overall Google Map of the District.

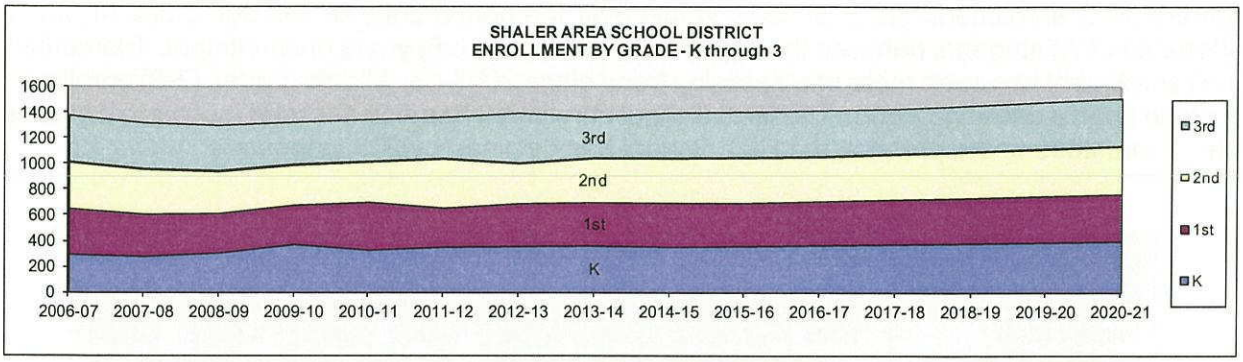
The map was generated by HHSDR with a commercial mapping program, and uses the US Geological Survey 7.5 minute quadrangle series as its base. To help confirm the boundaries of the District, information from District Office staff was used, as was the Department of Education's generalized school district map, and a detailed Census Tract map available on the PDE website.

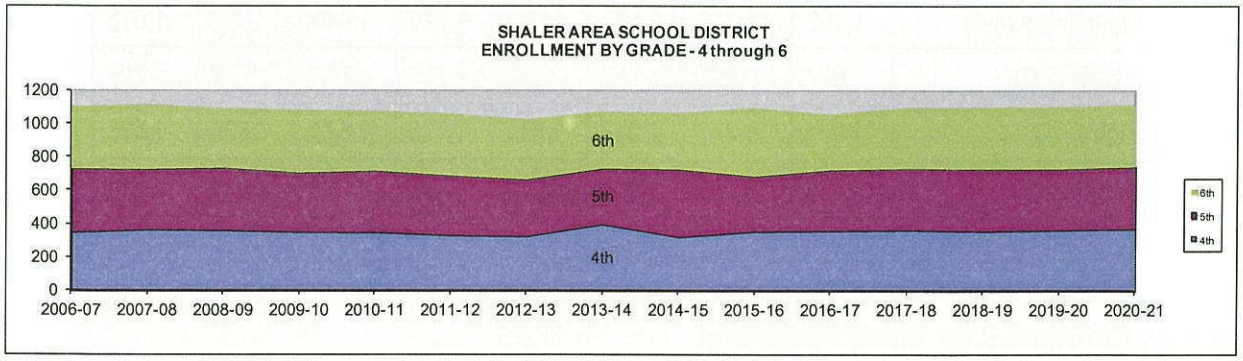
Shaler Area School District Map

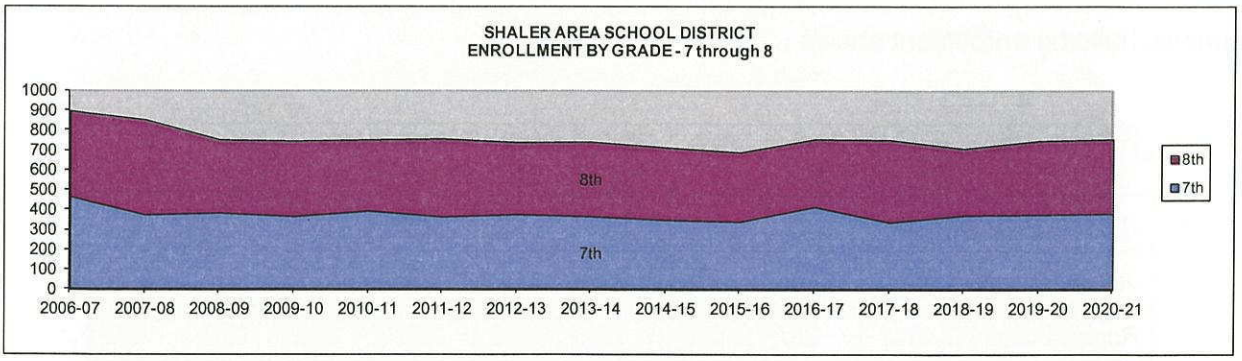


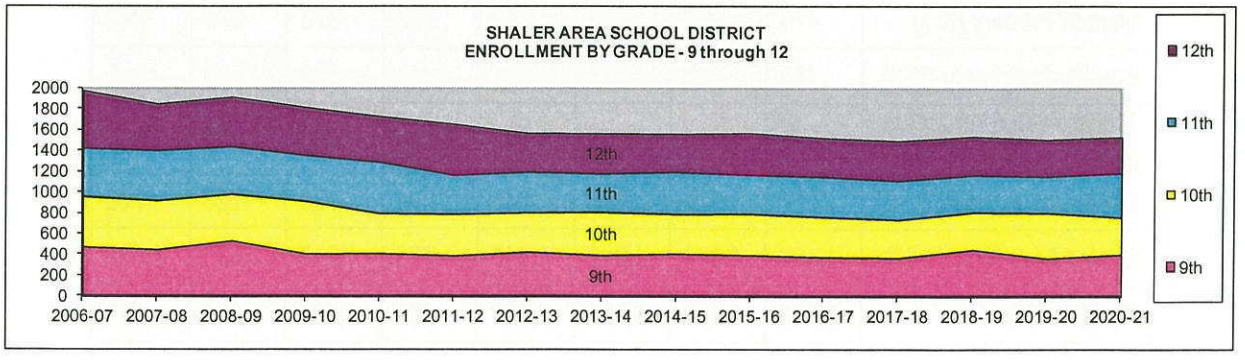
PDE Enrollments:

These charts illustrate grades K-3, 4-6, 7-8 and 9-12 enrollments as reported by the District to PDE (2006-07 through 2010-11), and PDE projections (2011-12 through 2020-21). In general, the data shows enrollment trends to be stable.









Historic Enrollment by Grade Level:

This table uses data from the 3rd day Enrollment report, submitted to PDE at the beginning of each school year, except for 2012-13 (which uses the District's June 3, 2013 report) and 2013-14 (which uses the March 3, 2014 report).

Primary (K-3) enrollment has been fairly stable over the period 2006-07 through 2013-14, with a difference of 79 students between the high (2006) and low (2008) years of enrollment. Elementary (4-6) enrollment has seen more of a declining trend since 2007-08. Middle grades (7-8) enrollment has also seen a declining trend. The High School enrollment has also declined, but a more gradual rate. From 2009 to the present, the High School has declined by 268 students.

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Primary (K-3)	1,383	1,325	1,304	1,330	1,352	1,331	1,389	1,338
Elementary (4-6)	1,102	1,113	1,092	1,082	1,076	1,040	992	1,018
Middle (7-8)	897	854	753	747	753	750	728	722
High (9-12)	1,971	1,847	1,912	1,811	1,726	1,640	1,525	1,533
Total SASD	**5,353**	**5,139**	**5,061**	**4,970**	**4907**	**4,761**	**4,634**	**4,611**

Historic Enrollment by School Building:

Specific building enrollment shows ...

	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Reserve Primary (K-3)	223	216	186	188	200	185	205	214
Jeffery Primary (K-3)	265	259	212	210	235	221	210	202
Rogers Primary (K-3)	287	273	204	216	227	200	203	192
Marzolf Primary (K-3)	473	458	318	342	348	373	379	349
Burchfield Primary (K-3)	485	486	382	371	344	352	392	381
Shaler Area Elementary (4-6)	1,211	1,114	1,089	1,083	1,074	1,040	992	1,018
Shaler Area Middle (7-8)	917	929	753	745	754	750	728	722
Shaler Area High (9-12)	1,492	1,404	1,917	1,815	1,725	1,640	1,525	1,533
Total SASD	**5,353**	**5,139**	**5,061**	**4,970**	**4,907**	**4,761**	**4,634**	**4,611**

Projected Enrollment by Stewman Demographics:

Stewman Demographics was retained by the District to examine, both population and economic factors affecting future expected student enrollment. On the population side, these included:

- Births
- Reproductive age females
- Net migration
- Shifts in population composition - young and old
- "Retention" ratios across grades and education alternatives used by the school age population - home schooling, parochial/private schools, charter and cyber-charter schools.

Particular attention was paid to the shifts in population age structure due to the baby boom, baby bust and echo boom age cohorts - which will likely determine the potential plateauing or increases in births on the horizon - especially whether to expect such effects in the next 5 years and hence in the second five years of the 10-year projections in this study.

Economic factors were represented by housing starts, both the long-term baseline level of construction and current/expected future level of construction. Two sets of data were reviewed: construction by housing type (single family dwelling, townhouse, or apartment), by year, by specific development; and specification of current new construction student/housing ratios by housing type.

Both baseline and increments in level of construction were examined. Given the downturn in new home construction in the last few years, an evaluation of the current status of development plans and what is in the pipeline (number of lots left in existing on-going plans, and number of lots in currently approved plans) is particularly important. Often, a substantial amount of new housing impacts are already embedded in the retention ratios. Thus, this, too, will need to be evaluated.

Dr. Stewman developed three Scenarios of the future aggregate or District-wide enrollment (*Scenario II - Projections with a Return to the Level of Births from 2000-2009 - a Decrease in Births* is not shown because it is the least likely to occur):

> ***Scenario I - Projections with Fertility, Aging and Embedded Growth*** - this is the second-most likely scenario, based on a more substantial increase in births documented over the decade of the 2000s.
>
> **Scenario III - Projections with Births Increasing by Another Modest Amount** - this is the most likely scenario, based on Echo Boomers in their 30s occupying three key reproductive age cohorts, resulting in additional births projected in 2014-18. Net in-migration between 2000 and 2010 was also documented.

Dr. Stewman also developed two Scenarios of the future building-specific enrollment:

> ***Scenario IV - Primary School Projections with Births at the Current Level*** - all schools are projected to have increased enrollment, with Rogers projected to grow the most. This scenario parallels Scenario I.
>
> ***Scenario V - Primary School Projections with Births at a Modest Amount Above the Current Level*** - this scenario parallels Scenario III, and projects an even higher enrollment at each school.

His report is presented on the following pages. The Tables are shown in the Appendix.

Demographic School Analysis: Population Projections for the Shaler Area School District

Shelby Stewman
Stewman Demographics
&
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February 21, 2014

Demographic School Analysis: Population Projections for the Shaler Area School District

The present analysis will consist of three parts: (1) an initial analysis of demographic and economic processes impacting student enrollments, (2) the ten-year projections of students by grade and level and (3) the ten-year projections of student enrollment for the five primary schools.

To arrive at these projections, we take an in-depth look at shifts in births, levels of in-migration and rate of new housing construction. We examine the changes that have occurred, including whether there have been shifts in the last decade or longer, and for births, in particular, we probe into the processes and structures underlying these shifts, also revealing likely directions in the future. Migration, in is shown to be quite important. We examine net-migration of *i)* families with preschool children, *ii)* students at each educational level and *iii)* the general population by age cohort. We also look at the change in the rate of new housing construction, which was considerable from 1996 to 2003. A brief overview of the three parts of the analysis is given below.

I. An initial analysis with five overall themes—

(1) *Births*: we find a turnaround in the number of births--from major decreases between 1990 and 2004 to a slight increase in 2005-09 and a more substantial increase in the two most recent known years, 2010 and 2011. Moreover, the births very likely will continue to increase in the near future—in the last years of the projections for this study and in the years immediately following. Shifts in births, past and future, are linked to two fundamental demographic variables: *i)* shifts in the number of key reproductive age females—due to the Baby Boom, Baby Bust and Echo Boom and *ii)* shifts in fertility behavior—the first and second waves of delayed childbearing. Such changes are taking place throughout the United States, Pennsylvania, Allegheny County and in the Shaler Area School District, as will be shown;

(2) *Net-migration*: we find that net migration is an important process at three levels: *i)* a loss of families with preschool children, but at the same rate as in the past 10 years; *ii)* families with school-age children moving in and partially muting the enrollment decreases due to the prior major decreases in births; and *iii) a general loss due to out migration* in the general population, but a net in-migration in three key reproductive ages (25-29, 30-34 and 35-39)—affecting the number of births, currently and into the future;

(3) *The K--G12 Exchange*: we find that an important component of the enrollment changes in each of the last two five-year periods is driven by the difference in the number of Kindergarten entrants and the number of Seniors graduating, which is a function of both shifts in births and cumulative net migration; this approach, when also broken down by educational level further underscores the importance of net in-migration. The extension of the K—G12 Exchange to more specific Entry—Exit Exchanges at each educational level also enables one to view the nature of the ***birth waves*** moving through the educational levels and impacting the student enrollment—including the sustained decreases observed over the past decade and the dampening of such decreases, as well as the most recent turnaround at the primary level—to a modest increase, directly related to the modest increase in births in 2005-09.

(4) *Alternate Schooling*: there were major declines in student enrollment in parochial/private schools by students residing in the school district, with relatively stable levels of alternative schooling in cyber charter and home school enrollments; and

(5) *New Housing*: we find that construction of new housing in the last 17 years was at its peak in the Shaler Area SD from 2000 to 2003, with an average of 71 units built per year and, of these, an average of 61 per year were single family dwellings (SFDs). Perhaps more pertinent is the level of new SFD construction the past five years; from 2008 to 2012, the average number of new housing units built was 9 per year, with none built in 2012.

An additional important change has been the offering of full time Kindergarten in the 2008-09 school-year with an increase of 4% of births enrolling in Kindergarten. Previously, the Birth-to-K ratio was 80%, with the remaining students enrolling in Grade 1 at 106% of prior births in the district. Currently, the B→K ratio is 84%.

The assessment of the above set of changes and processes is important in determining the nature of demographic modeling to use, in the selection of parameters for such models and in the interpretation of the underlying processes and the results.

II. Development and analysis of grade specific school district projections for the ten-year period, 2014-2023 (3 Scenarios).

All projections use the most current four-year retention ratios and Birth to Kindergarten ratios. Retention ratios in these scenarios have a baseline level of "growth" embedded in them. The alternative projections consider different levels of births from 2012-2018. Scenario I holds births at their current level, Scenario II takes births back to the level before any increase in births was observed—to a relative plateau and Scenario III maintains the current level of births for two years

(2012 & 2013) and then in the last 5 years of the projection increases births by the same amount as observed in the most recent uptick (2008-2011).

III. Development and analysis of areal specific district student projections for the five (5) primary schools over the ten-year period, 2014-2023 (2 Scenarios).

These projections use the most recent four-year retention ratios and the specific primary attendance areas for 2013. Births are now accounted for at the census tract level. These disaggregate projections also map to the more aggregate projections in Section II. Scenario IV maps to Scenario I using the current level of births and Scenario V maps to Scenario III having an additional increase in births in the last 5 years.

I. Initial Analysis

Five (5) major demographic and economic processes are examined with respect to projecting the expected shifts in student population in the Shaler Area School District (SD) over the next ten (10) years. The first major factor is the expected number of births per year—currently at about 438/year. We expect that this level will continue to hold for the remainder of the decade or continue to increase rather than return to its prior level of 414 per year. This assumption is based on our analysis of the shifting age structure for key reproductive age females and the in-migration of key reproductive age females over the past decade. This relatively new occurrence of increased births will affect entering cohorts at the Kindergarten level, changing their trajectory. A second factor of potential importance is the modest increase in the Birth-to-Kindergarten ($B_{t-5} \rightarrow K_t$) ratio. Before the shift to Full-Day Kindergarten, the B→K ratio was .805, meaning that for every 100 births to residents of the Shaler Area SD, on average, 81 Kindergarten students would subsequently enroll 5 to 6 years later. The most current post Full-Day Kindergarten B→K ratio is .841; hence, for the current level of births—438/year, this would mean 15 additional Kindergarten students (368

vs. 353). A third factor affecting the student population is the relative size of the Grade 12 (senior) and the Kindergarten classes. At an overall school district level, we may think of the seniors as exiting and the Kindergarten enrollments as "replacements." Thus, once overall net-migration from all grades is taken into account, this "replacement" factor is an additional component in determining the overall student population. Over the last ten years, the cumulative difference between the Kindergarten and Grade 12 senior classes (K - G12) has been a difference of -1,468 students. Since the student population declined by 964 students over this period, the difference—504 more students-- were net in-migrants. Focusing more intensively on the exchanges taking place beneath the K –G12 Exchange—at each educational level, Primary, Elementary, Middle and High School—provides insight into the large Birth Waves impacting the student enrollments over time. We will therefore take a brief look into these Entry--Exit Exchanges (4th factor) and the Birth Waves (5h factor) as they move through the student population. Which bring us to the sixth factor--new housing construction. The level of housing development was considerable from 2000 to 2003 where the rate of construction averaged 71 new housing units per year. It was also relatively high in the prior 4years, 1996-99 with an average of 56 new housing units being built Over 500 new homes were built during this 8-year period from 1996-2003.. However, new housing construction dropped to an average of 29 homes per year in 2004-2007 and with open spaces diminishing, coupled with the bursting of the financial and housing bubbles, new housing construction for the most recent five years has averaged 9 new housing units per year—11 per year over the 2008-11 4-year period and no new homes built in 2012. It seems

clear that new housing construction will not be a factor in the student projections in the near term.

The analysis to follow, preceding the student population projections, is important both in terms of determining the nature of the demographic modeling to use and in the selection of parameters for such models. The analysis is also important in the interpretation of the underlying processes involved in the derived projected enrollment. We begin by taking an in-depth look at the demographic side of the process—fertility and migration.

Fertility

An End to the Decrease in the Number of Births?

Table 1 provides the number of births by year over the last twenty-two years. As shown in one of the lower quadrants, per 5-year period, the decrease in number of births from 1990-94 to 1995-99 was quite large, -90 per year, followed by another large, though smaller decrease of -57 per year from 1995-99 to 2000-04. Then births basically stabilized, varying only by +5 per year. The average overall number of births for the 2000-09 decade was 414 per year, with an average of 411 in 2000-04 and of 416 in 2005-09--a plateau or slight increase. Across each 5-year period the rate of change has dampened—with smaller and smaller shifts, until 2010-11, where the rate of increase widened by +22, to 438 per year. Thus, we underscore two observations—*i) the number of births has turned around and is now increasing and ii) if one thinks of the shifts in terms of Birth Waves and their relative change in size (558→468→411→416→438 and Δ's of -90, -57, +5 and +22), then the subsequent expected shifts in student enrollment over the past decade in the Shaler Area School District should show*

major decreases, followed by a dampening down in such decreases, and then a turnaround with a slight increase; also, yet to arrive is an additional expected increase. Two major factors are potentially operative in affecting the direction and magnitude of births in the Shaler Area SD. The first relates to delayed childbearing. The second is the expected replacement of Baby Boom age cohorts with smaller Baby Bust age cohorts in their twenties and subsequently in their thirties—both being key reproductive age cohorts responsible for most of the births in the United States.

Relative Impact of the Different Age Cohorts: Delayed Childbearin

Table 2 enables one to evaluate whether part of the nature of the shift in birth is delayed childbearing. Note that the "Total Birth" column is the same as in Table 1, and Table 2 provides the number of births per age cohort for these 22 years. Here our concern is to address the relative impact of the different age cohorts and, in particular, to determine whether or not there is a shift to births in their thirties and early forties. At the top of Table 2, in the early 1990s, one can see the virtual equivalence of the 25-29 and 30-34 age-cohorts—each with about a 35% share of total births. The same point holds for the 20-24 and 35-39 age-cohort, except that the share is much smaller—each with a 12% share of total births. While the percentage distributions in 2005-09 and 2010-11 show small changes from 1990-94, they are basically very close—indicating little change. For example, the 2010-11 years are virtually the same for the 25-29 and 30-34 age-cohorts—each now with 33%-34% and the 20-24 and 35-39 age-cohorts, once again while much smaller—now hold a 13%-15% share of total births. Thus, at the beginning and end of the time frame under consideration, there has

been no major shift in the distribution of births toward the 30's and early 40's. What is clear is that the percentage share of births in the teens and early 20's had already declined by 1990 and that the that the percentage share of births in the 30's and early 40''s had already occurred, in term of the 1st wave of delayed childbearing. For instance, we have the following for the US, Pennsylvania and the Shaler Area SD, in terms of percentage distribution of births in 2010 (2005-09 for Shaler):

	15-19	20-24	25-29	30-34	35-39	40-44	45+
United States	6.7%	21.5%	30.0%	26.6%	12.2%	2.8%	0.2%
Pennsylvania	8.4%	22.4%	28.6%	26.0%	11.7%	2.6%	0.2%
Shaler Area SD	4.3%	14.6%	32.2%	30.5%	14.9%	2.8%	0.4%
Δ Shaler - PA	-4.1%	-7.8%	+3.6%	+4.5%	+3.2%	+0.2%	+0.2%

The Shaler births are even lower in the teens, and even more so in the early 20's (-8%), and are 3%-4% higher in the late 20's and the 30's. Overall, however, the distributions are similar and, in particular, have the largest share of births in the 25-29 and 30-34 age cohorts. This was not the case before the initial shift in delayed childbearing. This will be more readily apparent if we contrast the above distributions of births to those in 1980 and 1990 for Pennsylvania:

	15-19	20-24	25-29	30-34	35-39	40-44	45+
Pennsylvania: '80	13.7%	33.0%	32.8%	15.9%	3.8%	0.6%	0
Pennsylvania: '90	10.6%	23.9%	32.2%	23.8%	8.1%	1.1%	0
Δ	-3.1%	-9.1%	-0.6%	+7.9%	+4.3%	+0.5%	--

These data show that almost ½ (47%) of the 1980 births were to women in their teens and early 20's. In 2010, it was 31%, a drop of 16%. Moreover the two dominant cohorts in 1980 were both in their 20's, having 66% of all births. The shift from the largest share of births in the 20-24 and 25-29 age cohorts to the current one where the largest share of births is in the 25-29 and 30-34 age

cohorts is what we refer to as the 1st wave of delayed childbearing. This was a result of a rather large shift in births between 1980 and 1990—with fewer teen and early 20 births and higher births in both age 30-34 and 35-39 age-cohorts. Also note that in 2010, the Shaler Area SD distribution in births is far more similar to the PA distributions in 1990 and 2010. What has yet to occur in any of the distributions above—including Shaler--is another shift in distributions where the births in the 30-34 age-cohort is quite dominant and the 35-39 age-cohort is equal or larger than the 25-29 age cohort and the 40-44 age-cohort is about equal to that in the 20-24 age cohort. Shifts along these lines would signal the 2nd wave of delayed childbearing. The additional decreases in the teens and early 20's seem to be mostly delays, at the Shaler population level, that have moved to the 25-29 and 30-34 cohorts, consistent with further delayed childbearing in the 1st wave. In fact, the initial drop in the 20's and increase in the 30's between 1990-94 and 1995-99 in Table 2 might also seem to indicate additional delayed childbearing. However, a turnaround, with subsequent increases in the 20's and decreases in the 30's by 2005-09 and 2010-11 demonstrates that this is not the case. As we will show below, both of these changes are linked to the age structure in which there is a replacement of larger birth cohorts by smaller ones, such as the baby bust cohorts replacing those of the Baby Boom or the replacement of smaller cohorts by larger ones, such as the Echo Boom cohorts replacing the baby bust cohorts.

Relative Size of the Different Age Cohorts: Baby Boom, Baby Bust and the Echo Boom

A different story emerges if we take a closer look into the nature of the shifts in the number of births by age in Table 2. More specifically, can we identify the structures or processes underlying the shifts in the number of births in Tables 1 and 2? To begin to do so, we need to take into account the number of reproductive age women in different age cohorts, since the baby boom and baby bust periods have resulted in considerable oscillations in the number of women in the prime childbearing years. To be more concrete, at the peak of the baby boom (1957) the Total Fertility Rate[1] was 3.8, while at the trough of the baby bust (1976) it was 1.7, less than 1/2 that of the baby boom peak. Thus, the number of reproductive age females is much larger if they were born in the baby boom years and reciprocally, much smaller if they were born in the baby bust years. If fertility rates of these cohorts of women were the same over time, then the number of expected births would vary considerably, with more births to baby boom mothers and fewer births to baby bust mothers. This is at least part of explanation for the shifts in births, in terms of where in the age distribution to expect increases or decreases in births. It is also pertinent for expectations regarding future levels of births since we are currently beginning to see Echo Boom cohorts, which are larger than the baby bust cohorts, take center stage in the key reproductive ages. We will explore these points in more depth below.

[1] **The Total Fertility Rate (TFR) is the average expected total number of children that a woman will have under the current age-specific fertility rates.**

To what extent are the decreases in births due to the shifting age structure of reproductive age females? We will initially examine this question in three parts, examining the shifts in each case. We first look at shifts in the reproductive age female population. We then compare the shifts in the number of births. And, finally, we juxtapose the two types of shifts in terms of percentage changes, enabling one to assess the extent to which the shifts in the number of reproductive females maps to the shifts in births.

Table 3 provides the data for the shifts in the **number of *reproductive age females (NRAF)*** between 1990 and 2000 and between 2000 and 2010 for the Shaler Area SD residents. Between 1990 and 2000 (See upper quadrant of Table 3.), the increases in the reproductive age female cohorts in the school district were for women in the late thirties (+23%), early forties (+45%) and in their teens (15-19; +24%). In contrast, three key reproductive age cohorts (20-24,25-29 and 30-34) had substantial decreases in the number of women, with percentage changes of -25%, -32% and -8%, respectively. In the lower quadrant of Table 3, involving shifts between 2000 and 2010, we find increases in two of the same cohorts—15-19 (+15%) and 40-44 (+5%). The changes in the 20's and 30's are now reversed, with increases in both of the age 20 cohorts: 20-24 (+7%) and 25-29 (+2%) and decreases by women in their thirties—both the 30-34 and 35-39 age cohorts, with a drop of 12% and 1%, respectively.

In Table **4**, we summarize the changes in the **number of births by age cohort** between 1990 and 2000 and between 2000 and 2010. The upper quadrant of Table **4** provides a summary of the changes in the number and percentage change of ***births*** by age cohort between 1990-94 and 2000-04,

pertinent for the 1990 and 2000 cohort populations in Table 3. The lower quadrant of Table 4 provides the data for the shifts in births for the 2000 and 2010 cohort comparisons. Technically, the births in each five-year interval are produced by two five-year age-cohorts—the one aging into the age group and the one starting at that age group and aging out of that age group as the five years unfold. For simplicity, here we utilize only one cohort. For the 1990 and 2000 cohort comparisons, we follow them forward and compare births from 1990-94 and 2000-04. Thus, it is the cohort aging out of the age bracket that is the pertinent age cohort. For the 2000 and 2010 cohort comparisons, this is not possible since the births from 2010-14 have not all yet occurred. Hence, we will trace them backward and compare births from 1995-99 and 2005-09. The pertinent age cohort in this case is the one aging into the age bracket.

As may be seen in the upper quadrant of Table 4 (last column), there were large percentage decreases in births in all age cohorts below age 35 (from -16% to -45%). In contrast, the two older cohorts, ages 35-39 and 40-44, experienced percentage increases in the number of births of +3% and +41%, respectively. In the lower quadrant of Table 4, there are large percentage increases in births in only two age cohorts—20-24 (+13%) and 40-44 (+48%). In contrast, large decreases in births were experienced by the age-cohorts in their 30"s, of -29% for the 30-34 age-cohort and -12% for the 35-39 age cohort. The teen cohort also had a relatively large decrease (-8%), and the age-cohort 25-29 had a small decrease (-2%).

In Table 5 we juxtapose the two sets of percentage changes shown in Tables 3 and 4. The point in question now is whether the direction and relative

magnitude of the changes in the population of reproductive age women map to the changes in the number of births; if not, this indicates a change in fertility behavior--a behavioral change beyond the shift in numbers of women. Additionally, the sign of the percentage differential in column C indicates the direction of the fertility change—increased fertility or decreased fertility. *When the signs and sizes of the percentage changes in columns A and B are similar in Table 5, then the shift in the number of births is largely due to changes in the number of reproductive age women in that age cohort.* These percentages are in bold type. This particularly appears to be the case for all age cohorts age 25 and older in the upper quadrant of Table 5. For the age cohort 25-29, births dropped 45% and the number of women dropped by 39%. If we interpret column C as the relative magnitude and direction of a fertility change, then the change in NRAF and the change in fertility may be partitioned into their relative impact and in this instance it is the change in the number of women that accounts for 80% of the observed drop in births for this cohort.[2] Similarly, for the 30-34 age-cohort, births decreased by 22% while NRAF decreased by 21%, suggesting that 95% of the drop in births is due to the change in the number of women. In the cases of increases in births for the 35-39 and 40-44 age-cohorts, 72%-75% of the increase in births is due to increases in the number of women at these ages. The remainder is delayed childbearing. The two other cases in the upper quadrant of Table 5 both involve decreases in births. For the age-cohort 20-24, the relationship is no longer 1-to-1 but is rather about ½ -to-1 in terms of shifts in NRAF to births. That is, the NRAF dropped by 34%, but births dropped by only

[2]Using absolute values in summing columns B and C makes all comparisons consistent.

about ½ of that, 16%. In terms of impact, the drop in NRAF accounts for 2/3's of the drop in births and increased fertility 1/3. Finally, the last case is for the teen cohort, where the NRAF has a small increase (+2%), but births dropped by over 1/3 (-39%). Hence, The percentage share is therefore 6% NRAF and 94% decreased fertility—the increase in NRAF only muted the decrease in births. The largest values in column C, indicating a change in fertility, were for the age-cohort 20-24, as well as at the bookends—an increase in the age-cohort 40-44 and a decrease in the teenage-cohort. Even so, in 5 out of 6 cases, 66% to 95% of the observed change in number of births was due to changes in the number of reproductive age women. The fundamental reasons for such oscillations in the number of such women will be discussed below—it is no random process that is operative.

In panel II of Table 5 (the lower quadrant), the main effects of the Δ in NRAF are for the 20-24 and 30-34 age cohorts (also demarcated in bold type). For the age-cohort 20-24, almost 90% of the increase in births is due to an increase in the NRAF, while ¾'s of the decrease in births for the age-cohort 30-34 age-cohort is due to the decrease in the NRAF. For the age-cohort 25-29, the split is about 50-50 (46% NRAF and 54% increased fertility). For the 35-39 age cohort, instead of a 1-to1 ratio for Δ in NRAF and Δ in births, the ratio is about 1-to-3, accounting for 60% of the drop in births, while increased fertility (delayed childbearing) muted the drop to only 12% (vs. the 36% drop in NRAF) and still accounted for 40% of the outcome. At the oldest and youngest age range for reproduction, we find the expected—for teens the drop in births is much steeper than the Δ in NRAF, while for the 40's the increase in births not only overcame

the drop in NRAF, but it was also an increase of almost 50% (+48%).

Overall, we conclude that both processes are operative—*there are large drops or increases in the number of women in all four key age cohorts. In the upper panel of Table 5, the 20-24, 25-29 and 30-34 cohorts have large drops (21%-39%)---accounting for most of the change in the number of births by these women. in the lower panel of Table 5, there are large drops in the 30-34, 35-39 and 40-44 cohorts--(-22% to -36%) also accounting for most of the change in the number decreases in the number of births by these women. The exception is the 40-44 cohort discussed above. In terms of increases in the size of the cohorts, in the upper panel there are increases in the 35-39 and 40-44 cohorts, as well as the teen cohort. For the older cohorts, the* Δ in NRAF accounts for about 75% of the changes in births, while at the teen cohort it is a drop in fertility behavior that is dominant (94%). In the lower panel of Table 5, there are only 2 cohorts with increases in the NRAF—both of the 20's. The *20-24 cohort* Δ in NRAF maps closely to the Δ's in births (88%), while that of the 25-29 does not, accounting for only 40% of the shift. Thus in 8 out of 12 cases, the Δ in NRAF is the main factor in determining the Δ's in births. In three of the 4 remaining cases we are dealing with the bookends—teens, in particular, accelerating their decrease in fertility and the 40's, though small in number of births, also accelerating their increase in fertility—both consistent with delayed childbearing.

Here we note that the **baby bust** cohorts (denoted by the shaded percentages in Column B in Table 5) are important in both the 1990s and in the most recent decade. They were key cohorts in their twenties when births initially decreased from 1990-94 to 1995-99 and they are key cohorts in their thirties

when the impact of delayed childbearing continued into the 2000-09 period and muted the large decreases in their number. We will now look more closely at the shifting age structure and how it relates to the discussion above and to likely shifts in births in the future.

Baby Boom, Baby Bust and the Echo Boom: United States, Pennsylvania, Allegheny County and the Shaler Area School District

Before continuing, we will offer somewhat more context for the changes in the number of reproductive women. What is going on? Are the oscillations in terms of drops and then increases in the population of the key reproductive age cohorts peculiar or specific to the Shaler Area School District? To Pennsylvania in general? Or is this a more general phenomenon in the United States? Table 6 provides data for the United States, Pennsylvania and Allegheny County for five-year age cohorts from ages 0 to 44. *More detailed data on the age distributions for the Shaler Area SD, with explicit delineation of the Great Depression, Baby Boom, Baby Bust and Echo Boom cohorts are provided in Table 7.* The data for Table 6 extend from 1990 to 2010. At the national level, there were drops in the 20-24, 25-29 and 30-34 female age cohorts between 1990 and 2000 (See Change by Age Cohort Across Time, the second panel—lower quadrant of Table 6, page 1). One has to think in terms of generational change, where the births of daughters in one generation become the mothers of the next generation. Thus, the shifts in the 20-24, 25—29 and 30-34 age cohorts of females represent a more tidal shift from the baby boom to the baby bust due to changes in fertility levels as noted earlier--from total fertility rates, where on average, their mothers had 3.8 children in 1957 to 1.7 children in 1976. The low point in fertility rates in

the mid-1970s is referred to as the baby bust. To illustrate, there were 21.3 million children born between 1956 and 1960, at the height of the baby boom and 16.3 million births between 1971 and 1975 the onset of the baby bust, a decrease of 5.0 million births and a drop of 23%. Equally important, in 1990, the four five-year baby boom cohorts (born in 1946-1965) occupied three of the key reproductive age cohorts (25-29, 30-34 and 35-39, as well as the oldest reproductive cohort (40-44). In contrast, by 2000, the baby boom occupied only the two older reproductive cohorts and the two five-year baby bust cohorts (born in 1971-1980) were beginning to take center stage, occupying both key twenty-year-old cohorts. (See the bold, italicized age cohorts in the upper panel of Table 6 to view their aging from the teens to the 20's to the 30's.) A third key reproductive cohort, age 30-34 in 2000, was held by a medium sized cohort born between the baby boom and the baby bust (1966-1970). Two of the key reproductive age cohorts were smaller than their predecessors in 1990, as clearly shown in the upper panel of Table 6. The two teen cohorts in 1990 were also smaller than the younger age cohorts (< age 10-14). The identification of the Baby Boom, the baby bust and the Echo Boom cohorts for the total population (not just females) are readily seen for the Shaler Area SD in Table 7. Thus, a main key to understanding the declines in births from 1990-94 to 1995-99 and the continuation at the lower level of births from 1995-99 to 2000-04 is in recognizing the "age band" that the baby boom and baby bust cohorts occupied—nationally, in Pennsylvania and in Allegheny County, as well as in the Shaler Area School District. In short, much of what is being observed in the Shaler Area School District between 1990 and 2010 is a national process as well.

We will attempt to delineate where the local (Shaler Area SD) processes and age structures are similar and where they are distinct from those of the county, state and nation. The baby bust children (the 2nd generation) have matured to key reproductive ages and they have far fewer numbers than the prior baby boom cohorts. Even with national level legal immigration of almost a million per year from 1990 to 2005, the transition from the baby boom to baby bust process is still dominant and observable at the national level in the key reproductive age cohort shifts between 1990 and 2000.

By 2010, the relatively small female baby bust age-cohorts 30-34 and 35-39 may still be observed at all levels—national, state and county in Table 6 (see bold, italicized numbers in upper panel). For instance, in the upper panel of Table 6, in 2010, the smallest age cohort between the ages of 10-14 and 40-44 is the 30-34 baby bust cohort, with 9 million 966 thousand persons. As the baby bust cohorts aged into the 30-34 and 35-39 age groups, we can see in the lower panel of Table 6 that there are again population decreases of -2% and -11%. The same observations hold for Pennsylvania and for Allegheny County, when looking at the relative size of the age cohorts in the upper part of Table 6 and in terms of the population decreases in the lower panel of Table 6 (only the percentage changes are greater). The age cohort shifts in the Shaler Area School District, shown in Table 7, parallel those of the US, Pennsylvania and, especially Allegheny County, in terms of the direction of change in age-specific cohorts. Additionally, while the 2nd cohort of the baby bust (ages 30-34) in 2010 is smaller than the following younger cohort (25-29) and larger than the leading cohort of the baby bust (35-39), **and** has gained 504 more persons than if it had

just aged in place, it **still** has 562 fewer persons than the comparable 30-34 Transition Cohort in 2000. (See Table 7 for these comparisons.) The key idea in the deduction of the cohort replacement and net-migration streams from a comparison of two population distributions over time is the following: *I)* to make row comparisons for the cohort replacement outcomes (simply comparing the two distributions for each age cohort at the two points in time) and *ii)* to view the rows diagonally holding constant the birth year for net migration. In the ages 0 to 50, the changes in *ii)* are due almost entirely to net-migration, versus death. That is, for the initial (eg 2000) cohort ages x to x+5, ten years later it will be ages x+10 to x+15. If no one migrated, then the population would have the same number of people as in x to x+5—aging in place; If the numbers differ, then this is due to net-migration, with either additional gains or losses. These data for the Shaler Area SD are shown for all age cohorts in Table 7, including the above cohort decrease in the 30-34 age group of 562 (-19%) even with a net in-migration of 504 more men and women. Had this level of in-migration not occurred, then the loss by a pure cohort replacement process only would have been -1,066 or -37% [2,883 in 2000 and 1,817 for the cohort ten years younger in 2000 and simply aging into the 30-34 age bracket (1,817 – 2,883 = -1,066)]. This potential loss may also be computed by reversing the sign of the net-migration (ie, had it not occurred) and adding the two Δ columns, or (-562 + -504 = -1,066). The final outcome (-562) is obviously the Δ in cohort replacement numbers, which have both aging in place and net-migration processes at work. One may also look at these shifts from 2000 to 2010 to consider what to expect in the future. In this regard, in Table 7, from 2000 to 2010, one can see increases in

both of the twenties cohorts and decreases in the both of the thirties cohorts. There are decreases in the 15-19 and 40-44 cohorts as well. One can also compare the 2000 cohorts 10, 15, 20 25 and 30 to current 2010 cohorts age 20, 25, 30, 35,and 40 to have a good baseline, including taking into account the net-migration observed in the 2000 to 2010 deduction. As such, one would expect net out-migration for the teens and 20-24 age-cohort, but net in-migration for the 25-29, 30-34 and 35-39 cohorts. Thus, if the pattern continues, multiple Echo Boom cohorts should be moving into all key reproductive ages and births should increase. This would involve Echo Boomers both moving up (in age) and moving in (the 2000→2010 analog). Moreover, these Echo Boomers will be replacing the baby bust cohorts as this oscillatory process continues well into the 21st century.

A further note here regarding the Echo Boom is that it is expected to have an additional one to two age cohorts to follow. Thus, these increases are expected to continue, having longer-term implications for the level of future births. In short, the decreases in births over the past twenty years in the school district are strongly related to the shifts in the number and specific ages of the reproductive age women. And, these shifts in demographic age structure are part of a national, as well as a regional and local, set of shifts tied to at least one familiar term—baby boom—and now, by two less familiar terms—baby bust and echo boom. All municipalities and schools in the United States are embedded in these demographic processes. The distinctions revolve around the extent to which migration modifies these basic population distributions at the particular geographical level.

Total Fertility Rate

Before pursuing migration, we will briefly take a look at the Total Fertility Rate (TFR) in the United States. We do so for two reasons. First, the shifts in these TFRs have been largely responsible for the oscillations in the population age structure that we have just discussed. Second, for white and, more recently for white, non-Hispanic women, the TFRs have been remarkably stable for the past 37 years. Such stability then enables one to focus on the shifts in the number of reproductive women by age to better understand the shifts in the number of births, and to potentially better incorporate such insights into forecasts of future births—at a minimum, in terms of direction, if not magnitude. The Total Fertility Rate for the United States from 1917 to 2010 is given in Table 8. The dark shaded years denote the baby boom (1946-1965) and the lighter shaded years denote the baby bust (1971 to 1980). In Table 8, we may observe that the peak of the baby boom occurred in 1957 with a TFR of 3.77 and that the trough of the baby bust occurred in 1976 with a TFR of 1.74, as discussed earlier. We may also note from Table 8 that the TFR of 1.74 is the lowest TFR between 1917 and 2010, including the TFRs of the Great Depression. Similarly, the highest TFR between 1917 and 2010 is the TFR of 3.77. Hence, these fertility measures denote the two most distinct fertility points of the past century. Additionally, they are embedded in the most distinct streams of fertility surrounding them, with an entire set of years of relative high fertility and relative low fertility. It is these pivotal streams that are impacting school enrollments nationally, as well as in Pennsylvania, and certainly Allegheny County today, half a century away. They

will continue to do so, as well, into the future.

Table 9 provides the TFRs for white and white, non-Hispanic females from 1970 to 2010.[3] One of the most striking aspects of these data is the range of the TFRs from 1972 to 2007 for the white, and where it is possible to discern, the white, non-Hispanic females. For 37 years these TFRs have been in the 1.7 to 1.9 range, meaning that they are, in fact, very stable. In effect, we can treat them as constant. Thus, even with delayed childbearing, the total number of children that a woman is expected to have is the same—only the age has shifted. The delayed childbearing effect is a one- or two-wave impact and will not recur unless there is a return to more births at lower ages. Thus, once the delayed childbearing effect is complete, the main driver for the number of births, given the stability in the total fertility rates, will be the number of reproductive age women. This can change in two ways—(1) from large scale shifts in the reproductive population, as, for example, the baby boom and baby bust and (2) from net migration—in this case largely from new jobs, new housing or the relative attractiveness of the area, including the quality of the school district--in the case of in-migration, and the lack of jobs and/or quality of the schools, in the case of out- migration. It should be noted before continuing, that given the stability in the total fertility rate for whites, we may expect in both the short-term and the more long-term, future echo booms and echo busts, as the oscillation in the relative size of the birth cohorts already born dampens down. Certainly one of the mechanisms for change discussed above is occurring in the Shaler Area School

[3] In 2010, the Shaler Area SD population was 96% White, non-Hispanic, and 1% Black, Asian, Hispanic and 2+ races, respectively. There is no separate demarcation for race within the Hispanic population and thus here we have subtracted it from the 97% count by race only.

District—shifts in the number of reproductive age females, as shown in Tables 3 and 5, and in Table 7 for the total population.

Migration

Net Migration of Preschoolers

From Table 10 we may discern relative magnitude of the net migration of families with preschool children and more specifically, the net-migration of preschoolers per se. We do so by comparing the numbers of children less than 5 years of age from the 2010 US Census, with the number of births in the prior 5 years from the Allegheny Health Department. As shown in Table 10, there is a net out-migration of about 5% of this preschool age population—between 2005 and 2010 and between 1995 and 2000. In 2000, there were 2,231 children of preschool age (0-4), compared to 2,340 children born to residents in the school district, for a net difference of -109 or -22 per year. Similarly, in 2010, there were 1,978 children ages 0-4, compared to 2,080 children born to school district residents—a difference of -102 children or -21 per year. Based on the births over the prior 5 years, this is a net loss of 5% of the potential pool of new Kindergarten students. The same 5% loss also occurred the decade before. Thus, presently, this loss, due to net out-migration is quite stable—at about 5% of births. Hence, the expected ceiling for the Birth→Kindergarten ratio is 95%.

Net-Migration of Students

We now turn to the issue of the net migration of students from Kindergarten through Grade 12. Here, we use an accounting system based on a hypothetical or counterfactual case. What we refer to here as "net migration" pertains to all entries and exits. Thus, we are using the term "migration" in a very restricted

sense—migration into or out of the Shaler Area School District student population. Actual migrants into the school from outside the school district—whether from other parts of either Allegheny County or other parts of Pennsylvania, or other states, or even from overseas, are in the count, but not distinguished from one another. From the numerical enrollment data alone, we have no information on source of origin of the mover. The same holds for actual migration out of the school district—we do not know the destination. Additionally, we do not know the type of move if it is a local one. For example, a dropout at the high school level is certainly an exit and a second grader who did not attend the first grade in the Shaler Area School District is an entrant. Both are counted as "migrating" out of or into the school. In short, "net migration," as used here refers to the difference of all exits and all entrants to the Shaler Area School District. This "net migration" can be obtained using only enrollment data.[4] Below, we will briefly describe the method.

Initially, we will illustrate the method with the total Shaler Area School District. We will then also apply the method at each level—primary, elementary, middle school and high school. First, we momentarily assume the counterfactual case of "What if no one migrated?" Then, the change in the student population (C) would be totally determined by the difference in the sizes of the Grade 12 graduates exiting at the end of year t-1 and the size of the Kindergarten class change in overall enrollment, denoted by E, where E=(Total Enrollment in t) - (Total Enrollment in t-1). Now, denote "net migration" as F. Then, E=C+F or F=E-C. Table 11 provides these data and outcomes for the Shaler Area School

[4] Implicitly, this method assumes that the retention rate is either stable or zero.

District from 2000-2012. We will first illustrate the process by describing a single year and then we will discuss the overall results. For 2007-08 (Table 11, columns A and B and row t=2008-09; see footnote to the table), 451 seniors from the 2007-08 year exited, while 313 new students entered Kindergarten (column A) in 2008-09. With no migration, the student population would decrease by 138 students, (See Δ_1 or column C, which is Column A – Column B). The actual enrollment change was a loss of 85 students (Column E--the Δ_2 column is shown as the difference in the population at t minus the population at t-1). Therefore, "net-migration" here, in year t-1 or 2007-08, is positive (more entrants than exits), and is +53 (the Net Migration Column F, which is (E-C) or [-85 – (-138)] = +53). That is, 53 more students entered the school muting the loss from the K_t - $G12_{t-1}$ Exchange by almost 40%, a decrease of 85 versus 138.

A summary of the net migration is given at the bottom of Table 11, with the changes over the last 5 years in the last row and the prior 5-year changes in parentheses in the 10-year summaries. In the last 5 years, without migration, enrollment would have decreased by 493 students (last row, column C), but the actual decrease was 441 (last row, column E) due to the net in-migration of 52 students (last row, column F), a change of 10%. Migration was much more important in the prior five-year period, 2003-2007. (See the next to last row, columns C, E and F and the numbers in parentheses.) In this 5-year period, enrollment would have decreased by 975, without the net in-migration of 452 students. Hence, the actual decrease in enrollment, 523 students, was cut by almost ½ (46%). Overall, during the last 10 years, the loss from the K_t - $G12_{t-1}$ Exchange would have been about 1,500 (1,468) without net in-migration. It was

actually about a 1,000 (964), with 504 new students entering from outside, muting the decrease by just over 1/3 (34%).

To obtain more insight behind this overall or global replacement and net-migration processes, we will now summarize these processes at each educational level. Table 11A provides the summary information for the more general Entry—Exit Exchange by educational level. Note that the summary or overall outcome in Table 11A matches the K_t - $G12_{t-1}$ Exchange of Table 11. Since the two 5-year spans have very different K_t - $G12_{t-1}$ potential losses, the 10-year average is not very meaningful in terms of direction of change—so here we underscore that the K_t - $G12_{t-1}$ Exchange is very large in 2003-08 (-975), and that the 2009-12 value is about ½ of that (-493), indicating a decrease in potential losses. When examining the component parts at each educational level, we also ***add the 2000-02 annual averages per year (bottom of Table 11A*** and compare the 3 time spans. We find the following:

1) The largest Entry—Exit Exchanges, and hence potential losses, occur in 2000-02 at the Primary School level, in 2003-08 at the Elementary/Middle School levels and in 2009-12 at the High School level and 2) the two cases with Entry—Exit Exchanges with potential gains in students occur at the educational and time bookends--at the High School level in 2000-02 and at the Primary School level in 2009-12. The latter finding also has implications for the expected trajectories of these two levels in the near-term future.

Table 11B adds shading to Table 11A, depicting how Birth Waves move through educational levels. The Entry—Exit Exchange for the current High School classes, Grades 9 to Grade 12, are shown in gray shading—at the High

School level in 2009-2012. These students were born in 1995-99 and started Kindergarten in 2001 to 2004, moved to the Elementary/Middle School in 2005 to 2008 and moved to High School in 2009 to 2012. Thus, this set of birth cohorts, with births years 1995-99 may be thought of as Birth Wave #1, entering Primary School in 2001 and occupying K-Grade 3 by 2004, then entering Elementary School in 2004 and occupying Elementary Grades 4 to 6 and Middle School Grades 7 & 8 by 2009 and finally entering High School at Grade 9 in 2009 and occupying Grades 9 to 12 by 2013—the current High School students. As just described, their Birth Wave has moved through the entire set of grades from K to High School Senior over the last 12 years. Recall from Table 1, that the largest drop in births (-90) between 1990 and 2011 was the shift from 1990-94 to 1995-99---the latter being the birth years for the current High School student body. Following this Birth Wave over time in Table 11B, we can see that the largest set of Entry—Exit Exchanges in this table are, in fact, for this Birth Wave as it flows through each educational level. The 2nd Birth Wave, having birth years 2000-04 and shaded in yellow, currently occupies the Elementary and Middle School grades. It entered Primary School in 2005 to 2008. This Birth Wave #2, covering 5 years, is associated with the shift in births from 1995-99 to 2000-04, with a sizable drop in births (-57), though not nearly as large as that of Birth Wave #1. Thus, the Entry—Exit Exchanges in Birth Wave #2 are relatively high, but not as large as those for Birth Wave #1, as shown in Table 11B. Finally, the 3rd Birth Wave, shaded in green, with birth years 2000-04 entered K in 2009 and currently occupies all 4 grades of the Primary Schools. In 2009-12, it 's total 4-year Entry—Exit Exchanges are near zero (-5). And from Table 1 the shift in births--

as shown from 2000-04 to 2005-09 has the 1st positive numbers in the 5-year periods from 1990 to 2009 (+16 or 4.6/year). In short, the Birth Waves are dampening down, with a turnaround to increased births in the last 5-year period; hence, this Birth Wave essentially indicates a new plateau or a turnaround. If we consider the 4th, but unfinished, Birth Wave #4, with birth years from 2010-14, the 1st two years of this wave have an additional yearly average increase of +22. Thus, just as the most recent 5 year period shows a small increase in births, followed by an additional increment, we expect to see Birth Wave #4 as having a positive series of Entry—Exit Exchanges at the Primary level and for Birth Wave #3 to also have a set of positive Entry—Exit Exchanges at the Elementary and Middle School levels as it progresses to the next 2 levels.

The associated net-migration by educational level is shown in Table 11C. As noted above, the most recent two 5-year periods are quite distinct, making the ten year *average* less meaningful and we have substituted the 2000-02 three-year average in the last row of Table 11C. We observe first of all, that in general net-migration is positive, indicating net in-migration at all levels, except the most recent period for the High School, where it is negative (net out-migration), but very small. Secondly, with one exception, where it is stable, net-migration is decreasing per period. Overall, net-migration is decreasing at an accelerating rate. Third, and perhaps most importantly, net in-migration in the most recent period is quite small at all levels. It is only at the Elementary and Middle School levels that have 2-3 students per grade "moving in" per year. This contrasts with the 2000-02 period where each grade received 8 to 15 students per grade per year. At issue, then is whether net in-migration will remain low. Clearly, to date,

the net in-migration at all levels has muted the decreases in enrollment—though not reversed them. The Entry—Exit Exchanges, which have the Birth Waves embedded in them, as well as prior net migration, have been more powerful and have driven the decreases. Given the more recent stabilization of births from 2000-04 to 2005-09 (411→416), and the subsequent increase in births in 2010-11 (416→438), such Exchanges should now turn to increases, which should also generate Birth Waves that increase enrollment as they flow through each educational level. Thus, as student net in-migration is decreasing, births are now increasing.

Retention Ratios and Birth-to-Kindergarten Ratio

A third look at net migration, as well as the process of grade progression, involves retention ratios, to which we now turn. In this analysis we will use retention ratios as a baseline for projecting the changes in student population. The annual "retention ratios" shown in Table 12 are averaged over four years to increase the reliability of the estimates. "Retention ratios" have an element of growth embedded in them since they may be above one (1.0). Thus, for instance in Table 12 five of the twelve retention ratios are greater than 1.0. The largest retention ratio, from Grade 8→Grade 9, is 1.055, reflecting the movement of parochial students into the school at Grade 9, as well as other net in-migration. The ratios from grades 2,3,5 & 6 are also above 1.0, reflecting net in-migration. Before 2008, the 2nd largest retention ratio was that for K→Grade 1: 1.056, a 6% increase. This ratio became .99 after the implementation of full-day Kindergarten and the new Birth-to Kindergarten ratio, increased 4% from .805 to .841. All retention ratios below Grade 9, which are not above 1.0 are .99, indicating

virtually no net outflows. In the High School the retention ratios are all .98, indicating a loss of about 2% per year. In sum, at all levels up to grade 9 the student cohort progression is either stable (.99 of the prior year in 4 grades) or increasing (1.012 to 1.02 below grade 9 and 1.055 at grade 9), in 5 grades. *Since retention ratios have embedded growth and decline in them, this finding of a .99 or 1.0+ value for all grades up to High School and of .98 for all High School grades means that presently the shifts in enrollment will be driven by the trajectory of births and the subsequent flows of these Birth Waves. What seems different from the past, where this trajectory was distinctly downward is that this trajectory now seems to have turned upward—slightly, if one just uses the 2000-04 to 2005-09 shift, or higher yet, if one also uses the most recent 2008-11 data.*

Alternative Schooling

We now turn briefly to enrollment in alternative schooling by children of residents in the Shaler Area SD. The student enrollment in cyber charter schools is given in Table 13. There is no obvious trend for the 4 years that data are available. Enrollment has ranged from 80-89 students. Data for students being home schooled (See Table 14.) include 12 of the most recent 14 years and when aggregated into 4-year groups, the number of such students is remarkably stable, at 25-28 per year. The distribution across levels also seems relatively stable except for the higher Elementary numbers in 2000-03. The most striking finding here pertains to the parochial/private school enrollment, where the most complete data are from 2000 to 2007. (See Table 15.) Even here treatment of the data should be cautionary, rather than taken as complete. Nevertheless, the shifts in enrollment are quite dramatic: -22% in 2003, -55% in 2004 and over this

6-year period -74% (-963 students). The large drop of almost 500 (493) in 2004 coincides with Hurricane Ivan and the flooding in the area; the greatest decreases (423 of 493) came at Grades 2 to 8. However, total net in-migration in these grades to the Shaler Area SD was 78 or, at most, 18% of the (423) decline. Thus, the Shaler Area School District was not a primary destination for the drop between the 2003 and 2004 private/parochial school enrollments. Perhaps the main story here is that there has been a substantial decrease in such enrollment over the last decade—with the magnitude of these decreases not fully known. The relative number of such students, particularly at the primary and elementary levels, may become more important in the projections to follow if the pipeline for entry to the Shaler Area School District from private/parochial schools is decreasing, as has been observed in other school districts, and as appears to be the case with the Grade 8→Grade 9 decrease shown in Table 12.

Housing Development

Lastly, we take a look at housing development over the last 17 years (1996-2012). The importance of this segment of the analysis is that, should we find sufficient housing development, then we can go beyond the indirect effects of retention ratios and also take into account the direct effects of housing. Data were collected directly from Shaler Township and from the Census database on housing permits for the other three municipalities. These data are provided in Table 16. The peak of housing construction over the last 17 years was from 2000-2003, with an average of 71 new housing units per year and 61 new Single Family dwellings (SFDs) per year. There was also considerable housing development in the prior 4 years, 1996-99, with 56 new homes per year. Over

this 8-year period over 500 new housing units were built and almost 400 (390) of them were SFDs. In 2004-07, new home construction decreased to an average of 29 per year and then in 2008-11 dropped again to an average of 11 per year. In 2012, there were no new homes built. In sum, while there has been substantial new housing construction in the last 17 years, over ¾'s of that development occurred in the 1st 8 years (504 homes) versus the remaining ¼ in the last 9 years (160 homes). Thus, any new housing construction that would occur in the near term will be captured in the retention ratios, which include embedded growth.

Summary

In summary, we have examined several major demographic and economic effects to take into consideration when making our projections. We have looked rather deeply into the shifts in births and fundamental reasons for these shifts, including large changes in the female age structure in the childbearing years and changes in the timing of fertility, with the 1st waves of delayed childbearing—into the early thirties. Given the extremely constant level of fertility, in terms of number of children per mother—at least for non-Hispanic white females--this places great weight on the number of reproductive age females. The impact of the Baby ***Bust*** cannot be overlooked in playing a major role in the decreases in the number of births, but it's impact is drawing to an end and it is being replaced by the Echo Boom—which should reverse the trajectory for the number of births. In one of the projections, we will consider an end to the decline in the number of births, as well as modest increases, reflecting the current (2008-11) level of births. We will also consider the more unlikely case of a return to the 2000-09

level of births to set the lower limit on the projections, even if it is not as likely. A third projection will consider an additional increase in births beyond the current increase found in 2010-11. Migration is also expected to continue to play a role in how important the Echo Boom will be in the school district—whether further depleting the large Echo Boom cohorts in their twenties or increasing their number in the thirties. Moreover, in the projections for the individual primary schools, the factors must also be broken down geographically and mapped to the appropriate attendance areas. We will discuss these aspects as the details of the projections are presented.

II. Development and Analysis of Grade-Specific School District Projections for the Ten-Year Period 2014-2023

Scenario I: Projections with Fertility, Aging and Embedded Growth

The Scenario I projections use the following:

1. 2013 observed student populations per grade;
2. 2009-2012 four year retention ratios (Table 12) based on beginning of year school enrollment for 2009-2013;
3. For the 2014-2016 projections, the observed births (2008-2011) in the Shaler Area SDSD were used; and
4. For 2017-2023, the expected number of births is based on the annual average for the four most recent years, 2008-2011 (431).

As discussed in the analysis in Section I, the Shaler Area SD has experienced the following shifts in annual average births over the last 22 years:

1990-94	558	
1995-99	468	Δ -90
2000-04	411	Δ -56
2005-09	416	Δ +5
2010-11	438	Δ +22

The basis for this scenario is the turnaround in births, from a bottoming out in 2000-04, to a slight increase in 2005-09, to a more substantial increase in 2010-11. We do not take the latest full increase in this scenario, but use the most recent four-year average from 2008-11, 431 births/year for the projection years 2017-2023. The births for the 2014-2016 projections are already known, as shown in Table 1. The 2nd new factor incorporated in this scenario is the most recent Birth→Kindergarten ratio. It is now .841, about 4% higher then ratio before the implementation of full-day Kindergarten (.805). See Table 12. An additional important factor in this projection is that all retention ratios from K to Grade 8 are either .99 (4 of them) or greater than 1.0 (4 between 1.019 and 1.020 & Grade 8→Grade 9 at 1.055). Thus, the grade progression should be very stable or increasing until Grade 9. At Grades 9 to 11, the retention ratios are all .98, yielding a cumulative .98, .96 and .94 impact at Grades 10, 11 and 12 for the expected student progression at the student population level. These points regarding the retention ratios and their fairly narrow band underscore the importance of the births and what we have described in the analysis in Section I as Birth Waves. The turnaround in births from reaching a relative plateau from 2000-09, to the higher number of births most recently, suggest that we might begin to see in this scenario the effects of what we have termed in the

analysis in Section I, a 4th Birth Wave distinct from Birth Waves #1 to #3 which the district has experienced over the past decade and a half.

Table 17 presents the results for this scenario. As shown in the lower quadrant of the table, in the first five years, an eight per cent (8%) increase is expected at the Primary School level (+112), followed in the second five years by virtually no change (-3, 0%). At the Elementary School, there is an expected increase in the first five years of 52 students, a 5% increase. In the second five years, there is another expected enrollment increase of 39 students (+4%). The Middle School enrollment is expected to decline by 6% (-43) in the 1st five years, with a turnaround in the 2nd five years—increasing by 83 students (+12%). The trajectory of High School enrollment is parallel to that of the Middle School—a drop in the 1st five years of 116 students (-8%) and then an increase in the 2nd five years of 51 students (+4%), but the net outcomes are opposites. The Middle School is expected to have an increase of 40 students, while the High School's enrollment decreases by 65 students. Overall, the district enrollment in this scenario is expected to increase by 175 students or by 4%. Given the decrease at the High School, this total somewhat masks the expected increase of 200 students at the Primary and Elementary levels. ***This scenario is viewed as the 2nd most likely for the Shaler Area School District.***

Scenario II: Projections with a Return to the Level of Births from 2000-2009—a Decrease in Births

In this scenario, we assume, as in Scenario I that the fifteen-year decreases in births will end, but also that the increases found in the last 7 years are an aberration, particularly those in the last 2 years. Thus, births are here assumed to return to the level of births from 2000 to 2009—reweighting births to the prior decade when the Baby Bust cohorts were in their 20's and early 30's.[5] Births for the 2014-16 projections are already known (2008-11) and will be the same as in Scenario I. It is the births for the projections from 2017-2023 that we assume in this scenario will return to the 2000-09 average, 414/year. The results for Scenario II are shown in Table 18. At the Primary School level, in the 1st 5 years student enrollment is expected to increase by 84 students (6%), followed in the 2nd 5 years by a loss of 31 students (-2%). Compared to Scenario I, here the initial gains are less and the subsequent loses are greater (+84 vs +112 and -31 vs -3). At the Elementary School a gain of 52 students is expected, as in Scenario I. in the 1st five years, but in the 2nd five years, there is now basically no change (-3, 0% vs +39, +4%)). The Middle and High School projections are the same as in Scenario I, since the only difference is in births pertaining to enrollment at K starting in 2017. Such new entrants will not have reached Middle School by 2023. Thus, the expected changes in Middle School and High School enrollment for the shifts in the 1st 5 years, the 2nd 5 years and the total 10-year period, respectively, are as follows:

[5] In 2010, the Baby Bust cohorts were in their 30's and by next year will be in their late 30's and early 40's.

MS: -43 (-6%), +83 (+12%) and +40 (+6%) and
HS: -116 (-8%), +51 (+4%) and -65 (-4%),

After 10 years, the Primary School enrollment is expected to increase by 53 students (+4%), the Elementary School by 49 students (+5%), the Middle School by 40 students (+6%), with the only losses at the High School, a drop of 65 students (-4%). Overall enrollment, in this scenario increases by 77 students or +2% versus +175 and +4% in Scenario I. This scenario is viewed as the lower bound on student enrollment and the least likely for the Shaler Area School District.

Scenario III: Projections with Births Increasing by Another Modest Amount

This scenario provides a case with an additional modest Increase in the number of births per year. Here, we assume that births for the projections for 2017 and 2018 are the same as in Scenario I (431)--the 2008-11 yearly average--but that for the last 5 years, 2019-2023, births again increase by the same amount as the increase observed in 2010-11, +22. Hence, for these years, births are assumed to be 453 per year (431 + 22 = 453). Note that we have not assumed that births will be 22 more than the 2010-11 average (438); rather, 22 more than the 2008-11 average (431). This Scenario is therefore considered to depict a relatively conservative increase in births.

In the analysis in Section I, we discussed the likelihood of increases in births due to the replacement of Baby Bust cohorts by Echo Boom cohorts. Table 18A displays the age structural change across time by type of cohort in 5-year increments in time from 1990 to 2020. In 2010, the Echo Boomers have replaced the Baby Bust cohorts in the two 20 age cohorts and the Baby Bust

cohorts are in the two 30 age cohorts. By 2015—next year—the Echo Boomers will also occupy the early 30's and hold three key reproductive age cohorts (20-24. 25-29 and 30-34) and by 2020 will still occupy 3 key reproductive age cohorts (25-29, 30-34 and 35-39). Thus, there is a strong likelihood that births will increase yet further. Net in-migration into the Shaler Area SD for age-cohorts 25-29, 30-34 and 35-39, was also shown to have occurred between 2000 and 2010 (See Table 7.), providing further support for these expectations.

To reiterate, births to estimate the 2014-2016 projections are the same as in Scenario I and Scenario II, since these births are known (See Table 1). That is, the observed births in 2008-2011 were used to estimate the 2014-2016 Kindergarten enrollments (See Table 19 footnote). For 2017 & 2018, births are the same in Scenario I —at the current 4-year level—431 per year. What is distinct here is the assumed increase in births pertaining to the projections in the last 5 years, 2019-23, increasing to 453 per year.

The results for Scenario III are shown in Table 19. In the 1st 5 years, the Primary School enrollment now increases the same as in Scenario I—by 112 students. In the 2nd 5 years, on the other hand, we now have an expected increase of 73 students or +5% (versus the -3 (0%) in Scenario I). Thus, here, by 2023 the Primary School enrolment is expected to increase by 185 students (+14%), versus that of +109 in Scenario I. In this scenario, the Elementary enrollment also increases the same as in Scenario I, by 52 students (+5%), but now the increase in the 2nd 5 years is about double that of Scenario I—by 82 students (+8%). As was the case for both Scenarios I and II, at the Middle and

High School levels there are no differences, since any change in births for the projections from 2017 onward will not have reached the Middle School entrance at Grade 7 by 2023. Thus, we again find the following:

MS: -43 (-6%), +83 (+12%) and +40 (+6%) and
HS: -116 (-8%), +51 (+4%) and -65 (-4%),

for the shifts in the 1st 5 years, the 2nd 5 years and the total 10 years, respectively. On the other hand, the overall results are quite different. By 2023, the Primary School level is expected to increase by 185 students (+14%), the Elementary School by 134 students (+13%), with 40 additional students in the Middle School and 65 fewer students in High School. The total enrollment in this scenario is expected to increase by 6% to 4,924 students, an increase of 294 students (versus 175 students in Scenario I). In the 2 lower levels, the expected increase is 1 shy of 320 students (versus 200 students in Scenario I).

Scenario III, with births increasing, is the most likely scenario for the Shaler Area School District and Scenario I is the 2nd most likely--it assumes that births will remain at the current level. To assume that the births will remain at the current level essentially assumes that part of the Echo Boom will migrate out of the district and remain about the size of the Baby Bust cohorts currently residing in the district—an assumption that we think is unlikely. Scenario II, which assumes that the births will revert to the level in 2000-09, seems most unlikely. Scenario II ignores the most recent data on births over the past 4 years and totally ignores the replacement of the Baby Bust cohorts by the Echo Boom cohorts. It is included to provide a lower bound on enrollment. Scenario I assumes that that the current level of births is a new plateau. It serves as the 2nd most likely scenario, but disregards the trajectory

of births over the last 12 years, as well as the cohort replacement process underlying the shifts in births over the last decade and a half. Should net out-migration take place, contrary to the 2000 to 2010 process where it was positive for the 25-29, 30-34 and 35-39 age cohorts in the school district, then Scenario I would become the most likely case. Just as no long term increase in births of any substantial sort has yet to occur, similarly, no net out-migration of key reproductive age cohorts above age 24 has taken place either. Scenario III, taken here as the most likely, assumes only a modest increase in births above the current level in the last 5 years of the projections. Should this not occur, then, once again this becomes Scenario I. ***Thus, it seems reasonable in future planning to take into account both Scenarios I and III.***

III. Development and Analysis of Areal Specific District Student Projections for the Five Primary Schools by Grade: 2014-2023.

These two scenarios, each consistent with Scenario I or III, cover the five primary schools. All projections use the same four-year retention ratios (2008-2011) as in Scenarios I to III (See Table 12.). Likewise, a B→K enrollment ratio of .841 is assumed for all schools here, as well as in the more aggregate cases of Section II. What differs in these scenarios is that the births must be disaggregated and melded to the specific primary school attended. Thus, we start with the 2013 attendance boundaries and the 10 US census tracts—1 for Etna Borough, 1 for Millvale Borough, 2 for Reserve Township and 6 for Shaler Township. We will first describe the process for the 1st 3 projection years, where the total number of births per census tract is known. Mapping the two--

attendance boundaries and census tract boundaries--we find 4 tracts for which 100% of the new students are within a specific school's boundary and 6 tracts which cross attendance area boundaries—four in Shaler, as well as Etna and Millvale. We must then link the known 2013 K enrollment and the known births in 2008 (t-5) and 2007 (t-6)[6]. Using the 2 sets of maps where the 6 tracts must be split into distributions for students attending more than one primary school, we make estimates of the proportional share per tract for each school. We then take the known (observed) births per tract and multiply this number by the overall *actual* B→K ratio for 2013 (.849), to estimate the total number of Kindergarten children per tract. Then, the estimated proportional share (percentages) of Kindergarten students for each school per census tract are multiplied by the expected total number of Kindergarten children in each tract. Finally, the tract specific number of these children is summed to obtain each primary school's expected Kindergarten enrollment. The initial estimated proportional shares per tract were adjusted until an extremely close fit was obtained for the 5 Primary Schools. This fit was as follows:

	Estimate #1	Actual	Δ
Birchfielld	97	97	0
Jeffrey	51	50	+1
Marzolf	96	94	+2
Reserve	58	59	-1
Rogers	59	60	-1
Σ	361	360	+1

[6] Where births in 2008 (t-5) and 2007 (t-6) are weighted by .667 and .333, corresponding to the September 1 cut-off date for age 5.

The resulting "Elementary-to-Tract Distribution Table" for the allocation of births is as follows:

	Primary School					
Census Tract	Birchfield	Jeffrey	Marzolf	Reserve	Rogers	Σ
4250	.55	.30	.25			1.0
4270			.70	.30		1.0
4281				1.00		1.0
4282				1.00		1.0
4263	.15				.85	1.0
4264	.30	.70				1.0
4267	1.00					1.0
4268	1.00					1.0
4271		.30	.35		.35	1.0
4272			.75	.25		1.0

The estimated Kindergarten projections may be thought of in 2 parts—the years for which we know the births by census tract (for K students in 2014 to 2016) and the years for which we don't know the births, nor the distributions of births by census tract—2017 to 2023. For the latter, we specify the total births and use the 4-year average number of births per census tract in 2008-2011 to obtain the expected distribution of births per census tract. These were as follows:

Census Tract	%
4250 Etna	.099
4270 Millvale	.120
4281 & 4282 Reserve	.084
4263 Shaler	.141
4264 Shaler	.112
4267 Shaler	.059
4268 Shaler	.112
4271 Shaler	.136
4272 Shaler	.138

Scenario IV: Primary School Projections with Births at the Current Level

The results for Scenario IV, corresponding to the more aggregate Scenario I, and based on maintaining the current level of births, are shown in Tables 20A to 20E. For the Birchfield Primary School (Table 20A), an increase of 30 students is expected in the 1st five years and a decrease of 4 students is expected in the 2nd five years. Enrollment is expected to increase from 377 students to 403 students (+7%). The enrollment at the Jeffrey Primary School (Table 20B) is expected to remain at its current level (+2 in the 1st 5 years, with no change in the 2nd 5 years). Thus, enrollment by 2023 is projected to be 205, compared to 203 students in 2013. The Marzolf Primary School enrollment, like that of Birchfield, is expected to increase in the 1st 5 years (+35) and decrease slightly (-3) in the 2nd 5 years. In these projections, Marzolf's enrollment in 2023 is 375 (+9%), compared to the current enrollment of 343 students. (See Table 20C.) The Reserve Primary School (Table 20D) is expected to increase

somewhat—by 6 in the 1st 5 years and by 3 in the 2nd 5 years. Thus, by 2023 it is projected to grow by 9 students—from 213 to 222 students (+4%). Finally, the Rogers Primary School (Table 20E) is projected to have a rather large growth in the 1st 5 years--+42 students and stay at about that level in the 2nd 5 years (+1). By 2023, Rogers is projected to increase from 199 students to 242 students (+22%), the largest change among the five primary schools.

Scenario V: Primary School Projections with Births at a Modest Amount Above the Current Level

This Scenario corresponds to Scenario III at the more aggregate level—the scenario viewed as the most likely scenario in Section II. The approach is exactly the same as in Scenario IV, but now the births in the last 5 years are increased by 22/year to 453. In Scenario IV, births remained at 431/year from 2017 to 2023. The results for Scenario V are presented in Tables 21A to 21E. Since the only difference in Scenario IV and Scenario V is in the births pertaining to the last 5 years, the results for the 1st 5 years will also be the same. The Birchfield Primary School (Table 21A) is now projected to increase by 30 students in the 1st 5 years, followed in the 2nd 5 years by anther increase of 24 students in the 2nd 5 years. By 2023, Birchfield is expected to have 431 students, compared to its current enrollment of 377 students (+54), an increase of 14%. The Jeffrey Primary School (Table 21B) is now expected to increase beyond its initial 2 students in the 1st 5 years to an additional 12 students in the 2nd 5 years, a 7% cumulative growth. The Marzolf Primary School (Table 21C) is projected to increase by 35 students in the 1st 5 years and by about ½ of that in the 2nd five years (+17). By 2023, Marzolf is expected to have 395 students, compared to its

current number of 343 students, a growth of 15% (+52). The Reserve Primary School (Table 21D) in this scenario is expected to initially increase by 6 students (by 2018), followed by an increase of 15 students by 2023; total expected growth is 21 students (+10%). And, finally the Rogers Primary School (Table 21E) is projected to increase by 42 students by 2018 and then by another 13 students by 2023—for a total growth of 55 students from its current 199 students. This is an increase of 28%.

It is important to emphasize that attendance boundaries are not set in stone and may be adjusted. In fact, the proportions to match the 2013 Kindergarten enrollment must be adjusted somewhat to match the 2011 and 2012 enrollments—attesting to the necessary flexibility of attendance boundaries. Thus, while the projections for the primary schools in Scenario IV and Scenario V assume fixed boundaries, they obviously can be changed where appropriate. These projections are heavily dependent on the 2013 allocation of Kindergarten students. They are also in line with the more aggregate projections in Scenario I and Scenario III.

A summary of the expected changes in Scenario IV is given below

Primary	2013 Population	Change 2013→2018	Change 2018→2023	2023 Population.	% Change
Birchfield	377	+30	-4	403 (+26)	+7%
Jeffrey	203	+2	0	205 (+2)	+1%
Marzolf	343	+35	-3	375 (+32)	+14%
Reserve	213	+6	+3	222 (+9)	+4%
Rogers	199	+42	+1	242 (+43)	+22%
Total	1335	+115	-3	1447 (+112))	+8%

The student projections in Scenario IV map very closely to those at the primary level in Scenario I. For instance in 2018, there is a difference of 3 and in 2023 the difference is also 3. These very small differences are due to multiple multiplication round offs and are far less than one per cent. In short, the two levels of projections in terms of the aggregate and disaggregate results are extremely consistent. The Scenario I results are as follows:

Educational Level	2013 Population	Change 2013→2018	Change 2018→2023	2023 Population.	% Change
K→G3	1,335	+112	-3	1,444 (+109)	+8%
G4→G6	1,027	+52	+39	1,118 (+91)	+9%
G7→G8	724	-43	+83	764 (+40)	+6%
G9→G12	1,544	-116	=51	1,479 (-65)	-4%
Total	4,630	+5	+170	4,805 (+175)	+4%

Similarly, a summary of the expected changes in Scenario V is given below:

Primary	2013 Population	Change 2013→2018	Change 2018→2023	2023 Population.	% Change
Birchfield	377	+30	+24	431 (+54)	+14%
Jeffrey	203	+2	+12	217 (+14)	+7%
Marzolf	343	+35	+17	395 (+52)	+15%
Reserve	213	+6	+15	234 (+21)	+10%
Rogers	199	+42	+13	254 (+55)	+28%
Total	1335	+115	+81	1,531 (+196))	+15%

The student projections in Scenario V also map very closely to those at the primary level in Scenario III. For instance in 2018, in this case there is a difference of 3 and in 2023 the difference is 11. These small differences are due to multiple multiplication round-offs and are less than one per cent. In short, the two levels of

projections in terms of the aggregate and disaggregate results remain extremely consistent.

The Scenario III results are as follows:

Educational Level	2013 Population	Change 2013→2018	Change 2018→2023	2023 Population.	% Change
K→G3	1,335	+112	+73	1,520 (+185)	+14%
G4→G6	1,027	+52	+82	1,161 (+134)	+13%
G7→G8	724	-43	+83	764 (+40)	+6%
G9→G12	1,544	-116	+51	1,479 (-65)	-4%
Total	4,630	+5	+289	4,924 (+294)	+6%

Both set of results, extending Scenario I to Scenario IV and extending Scenario III to Scenario V, are given here since it was noted at the end of Section II that while Scenario III is viewed as the most likely scenario for the Shaler Area School District, it would be reasonable for future planning to take both scenarios into account. The same point obviously applies to Scenarios IV and Scenario V, where consistent with the conclusion in Section II, Scenario V remains the most likely scenario for the Shaler Area School District. However, the results in Scenario IV are the 2nd most likely case and might hold if the increase in births stalls.

ELEMENTARY BUILDING CAPACITY

District/CTC: Shaler Area School District

Project Name: Facility Study - Present Capacity

Grades: K - 3

#1	#2	SCHOOL: Reserve Primary				SCHOOL: Jeffery Primary			
		PRESENT		PLANNED		PRESENT		PLANNED	
		#3	#4	#5	#6	#3	#4	#5	#6
NAME OF SPACE	UNIT FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP
HALF-TIME KINDRGRTN	50								
FULL-TIME KINDRGRTN	25	3	75			2	50		
REG CLSRM 660+ SQ FT	25	8	200			8	200		
OTHER: TI,SpEd,A,M,C,AS		6				7			
BUILDING TOTAL	XX	XXXXXX	275	XXXXXX		XXXXXX	250	XXXXXX	

#1	#2	SCHOOL: Rogers Primary				SCHOOL: Marzolf Primary			
		PRESENT		PLANNED		PRESENT		PLANNED	
		#3	#4	#5	#6	#3	#4	#5	#6
NAME OF SPACE	UNIT FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP
HALF-TIME KINDRGRTN	50								
FULL-TIME KINDRGRTN	25	3	75			4	100		
REG CLSRM 660+ SQ FT	25	7	175			14	350		
OTHER: TI,SpEd,A,M,C,AS		6				7			
BUILDING TOTAL	XX	XXXXXX	250	XXXXXX		XXXXXX	450	XXXXXX	

#1	#2	SCHOOL: Burchfield Primary				SCHOOL: Shaler Area Elementary			
		PRESENT		PLANNED		PRESENT		PLANNED	
		#3	#4	#5	#6	#3	#4	#5	#6
NAME OF SPACE	UNIT FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP
HALF-TIME KINDRGRTN	50								
FULL-TIME KINDRGRTN	25	4	100						
REG CLSRM 660+ SQ FT	25	16	400			45	1,125		
OTHER: TI,SpEd,A,M,C,AS		11				22			
BUILDING TOTAL	XX	XXXXXX	500	XXXXXX		XXXXXX	1,125	XXXXXX	

#1	#2	SCHOOL:				SCHOOL:			
		PRESENT		PLANNED		PRESENT		PLANNED	
		#3	#4	#5	#6	#3	#4	#5	#6
NAME OF SPACE	UNIT FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP
HALF-TIME KINDRGRTN	50								
FULL-TIME KINDRGRTN	25								
REG CLSRM 660+ SQ FT	25								
OTHER:									
BUILDING TOTAL	XX	XXXXXX		XXXXXX		XXXXXX		XXXXXX	

Only kindergarten and regular classrooms 660 square feet or greater should be reported. Although special education rooms and pre-school rooms may be eligible for capacity, these spaces should not be included in the room counts reported above. The following spaces do not receive reimbursable capacity and therefore should not be included in the capacities for an elementary school building: science labs, computer rooms, art rooms, music rooms, small and large group instruction rooms, and multi-purpose rooms.

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MIDDLE/SECONDARY BUILDING CAPACITY

District/CTC: Shaler Area School District

Project Name: Facility Study

Grades: 7 - 8

#1	#2	SCHOOL: Shaler Area Middle School				SCHOOL:			
		PRESENT		PLANNED		PRESENT		PLANNED	
		#3	#4	#5	#6	#3	#4	#5	#6
NAME OF SPACE	UNIT FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP
REG CLSRM 660+ SQ FT	25	26	650						
SCIENCE CLSRM 660+ SQ FT	25	4	100						
SCIENCE LAB 660+ SQ FT	20	2	40						
PLANETARIUM W/CLSRM 660+ SQ FT	20								
ALTERNATIVE ED ROOM 660+ SQ FT	20								
BUSINESS CLSRM 660+ SQ FT	25								
BUSINESS LAB 660+ SQ FT	20								
COMPUTER LAB 660+ SQ FT	20	3	60						
TV INSTRUCTIONAL STUDIO 660+ SQ FT	20								
ART CLASSROOM 660+ SQ FT	20	2	40						
MUSIC CLASSROOM 660+ SQ FT	25	1	25						
BAND ROOM 660+ SQ FT	25	1	25						
ORCHESTRA ROOM 660+ SQ FT	25								
CHORAL ROOM 660+ SQ FT	25	1	25						
FAMILY/CONSMR SCIENCE 660+ SQ FT	20	2	40						
IA/SHOP 1800+ SQ FT	20	1	20						
TECH ED 1800+ SQ FT	20	1	20						
VO AG SHOP W/CLSRM 660+ SQ FT	20								
DRIVER'S ED 660+ SQ FT	20								
GYM 6500-7500 SQ FT	66	1.0	66						
AUX GYM 2500 SQ FT	33	1	33						
OTHER: Special Education		10							
OTHER:									
BUILDING TOTAL	XXX	XXXXXX	1,144	XXXXXX		XXXXX		XXXXX	
MS/SEC UTILIZATION (BLDG TOTAL X .9)	XXX	XXXXXX	1,030	XXXXXX		XXXXX		XXXXX	

#1	#2	SCHOOL:				SCHOOL:			
		PRESENT		PLANNED		PRESENT		PLANNED	
		#3	#4	#5	#6	#3	#4	#5	#6
NAME OF SPACE	UNIT FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP	NUMBER OF UNITS	TOTAL FTE CAP
REG CLSRM 660+ SQ FT	25								
SCIENCE CLSRM 660+ SQ FT	25								
SCIENCE LAB 660+ SQ FT	20								
PLANETARIUM W/CLSRM 660+ SQ FT	20								
ALTERNATIVE ED ROOM 660+ SQ FT	20								
BUSINESS CLSRM 660+ SQ FT	25								
BUSINESS LAB 660+ SQ FT	20								
COMPUTER LAB 660+ SQ FT	20								
TV INSTRUCTIONAL STUDIO 660+ SQ FT	20								
ART CLASSROOM 660+ SQ FT	20								
MUSIC CLASSROOM 660+ SQ FT	25								
BAND ROOM 660+ SQ FT	25								
ORCHESTRA ROOM 660+ SQ FT	25								
CHORAL ROOM 660+ SQ FT	25								
FAMILY/CONSMR SCIENCE 660+ SQ FT	20								
IA/SHOP 1800+ SQ FT	20								
TECH ED 1800+ SQ FT	20								
VO AG SHOP W/CLSRM 660+ SQ FT	20								
DRIVER'S ED 660+ SQ FT	20								
GYM 6500-7500 SQ FT	66								
AUX GYM 2500 SQ FT	33								
OTHER:									
OTHER:									
BUILDING TOTAL	XXX	XXXXXX		XXXXXX		XXXXX		XXXXX	
MS/SEC UTILIZATION (BLDG TOTAL X .9)	XXX	XXXXXX		XXXXXX		XXXXX		XXXXX	

REVISED JULY 1, 2010 FORM EXPIRES 6-30-12 PLANCON-A08

These tables compare the Department of Education's 2014 building capacities (1st column) with March 3, 2014 enrollments provided by the School District (2nd column), Stewman Demographics projected 2023 enrollment, and PDE projected for 2020-21 (3rd and 4th columns).

K - 3 Primary Schools

	2014 PDE Capacity	3 / 2014 Enrollment	Stewman 2023 Projected Enrollment	2020-2021 PDE
Reserve	275	214	234	
Jeffery	250	202	217	
Rogers	250	192	243	
Marzolf	450	349	395	
Burchfield	500	381	431	
TOTAL	**1,725**	**1,338**	**1,520**	**1,519**

4 - 6 Elementary Schools

	2014 PDE Capacity	3 / 2014 Enrollment	Stewman 2023 Projected Enrollment	2020-2021 PDE
Shaler Area ES	1,125	1,018	1,161	1,110

7 - 8 Middle School

	2014 PDE Capacity	3 / 2014 Enrollment	Stewman 2023 Projected Enrollment	2020-2021 PDE
Shaler Area MS	1,030	722	764	756

9 - 12 High School

	2014 PDE Capacity	3 / 2014 Enrollment	Stewman 2023 Projected Enrollment	2020-2021 PDE
Shaler Area HS		1,533	1,479	1,530

Total

	2014 PDE Capacity	3 / 2014 Enrollment	Stewman 2023 Projected Enrollment	2020-2021 PDE
Shaler Area School District		4,611	4,924	4,915

Address: 2107 Lonsdale Street
Pittsburgh, PA 15212

Constructed: 1965
Additions and Alterations: 1987

Enrollment: 214 Students (K-3), 25 Staff

Size: 29,575 sq. ft. on approx. 4.25 acres

Site: The site is situated on a relatively flat plateau within a residential neighborhood in Reserve Township. The building shares its property with an adjacent playground, lighted ball field and basketball courts.

The asphalt drives and parking lots and the concrete curbs and walks are all in fair condition but need repaired at damaged areas. Several storm inlets have deteriorated tops causing the pavement to sink at their perimeter and cause cracking. These inlet tops should be repaired to prevent further settlement. The wood timbers which form a retaining wall near the outdoor courtyard are rotting and causing the retained earth to erode. This wall is in poor condition and should be replaced. Subsurface cut-off drains were recently added at the rear of the building to prevent flooding during rain events into the adjacent classrooms. It was also reported that the site is situated on subgrade rock, discovered during renovations to the recreation fields several years ago.

Structure: The original 1965 building is a single-story structure constructed on concrete spread footings. The roof framing consists of sloped steel joist (for roof drainage) resting on masonry bearing walls. The 1987 classroom addition is a steel column framed roof structure constructed on concrete grade beams and deep caissons. The upper gymnasium wall is showing signs of brick mortar deterioration and should be repointed.

Roof: The roof is an adhered EPDM rubber membrane on rigid insulation that was last replaced about 1998. Overall the roof membrane and edging appear to be in fair condition. A roof drain leader was reported to be leaking in Room 101 and needs further evaluation. Status of warranty is unknown.

Windows: The windows were previously replaced about 1987 with Traco aluminum windows. Several window units have been replaced since, but the remaining continue to leak air and water at the glazing and the perimeter of the aluminum framing. The solid panels within these windows contain phenolic insulation, causing rapid deterioration of the panel's surface, resulting in regular patching and/or replacement of these individual panels. These windows are in poor condition and need replaced. Also, the windows in general are small due to the added solid panel installed in the top of the unit, which prevent optimizing natural daylight to the interior spaces.

Exterior Doors / Frames: The original building's exterior aluminum entrance doors were replaced in 2000 and the exterior hollow metal doors at the addition in 1987. The main entrance doors permit water to enter at their bases, likely from the lack of positive drainage and slope of the adjacent exterior walk. The aluminum entrances are in fair condition; the hollow metal doors and frames are rusted and in poor condition.

Interior Doors/ Hardware: The deadbolt latch and pull-style hardware installed on the hollow metal doors in the 1987 addition do not permit new hardware retrofitting and will require full door replacement to be code and ADA compliant. Some hollow metal door hardware in the original building have been replaced with lever type hardware, but the remaining needs replaced to also meet code. Several original aluminum doors exist on the interior that formerly were exterior building entrances that also need replaced to meet today's ADA standards.

Interior Spaces: The building is very well maintained and has good housekeeping.

Corridors: The terrazzo floors in the original building are in fair condition and need refinished by grinding, polishing, and sealing to restore their original luster. The structural glazed face tile (SGFT) wainscot with painted plaster above throughout the original building is in fair condition. The 2x4 acoustic ceiling tile throughout is also in fair condition, with only a few stained tile from previous leaks. The vinyl composition floor tile (VCT) and the painted concrete block (CMU) walls in the more recent addition are also in fair condition. Corridor lockers in the 1987 addition are in fair condition and need repainted with latch upgrades if they are to be reused.

Classrooms / Instructional Spaces: Classroom cabinets along the window wall of each classroom which are integral to the unit ventilators (UVs) lack enough storage space and are in poor condition. The wardrobe coat closets in the rooms are original and the availability of replacement parts is minimal to properly maintain them. The majority of classrooms have chalkboards installed on their instruction walls which could be considered for replacement with white/markerboards and/or smartboards to meet today's technology needs.

Library: The Library is undersized for today's educational program needs to instruct a class in media technology. The tables and shelving are in poor condition, and the floor carpet is beyond its useful life.

Cafeteria/ Gymnasium Stage: The wood floor, impact cushions, and athletic equipment are in fair condition. Additional wall impact cushions should be installed on adjacent walls to prevent injuries occurring from the small court size. The acoustics in the room during activities is poor due to the hard ceiling and walls within the space. An acoustic absorbing material should be installed to reduce the loud noise. Storage for chairs (since no bleachers exist) and gymnasium equipment are lacking. The stage curtains and rigging are in fair condition.

Interior Spaces (continued):

Kitchen: The satellite/re-heat kitchen is small and undersized for daily lunch servings to occur. The few pieces of equipment are well maintained, but beyond their useful life. A lack of code-required ventilation exists, and space prohibits introducing any additional equipment to offer alternative cooking options. The upright cooler and freezer do not permit adequate storage of food for extended periods. The access to the kitchen is awkward and congested for both deliveries and serving.

Office: The main office / nurse's suite has had several improvements to cabinets, casework, and finishes made by the District. In general, the offices are undersized to accommodate the office staff and storage needs.

Restrooms: The single set of boys/girls restrooms are in fair condition, but require improvements to meet turning and floor clearances required by ADA. Only one of the two (2) currently assigned kindergarten rooms has a toilet room. The small, single-person rest rooms do not meet ADA requirements.

HVAC:

Existing Systems: Three (3) gas-fired, Peerless boilers exist; they are original and need to be upgraded.

Three (3) in-line pumps serve the heating water systems. They are constant volume and are original. Given their age they should be replaced. The hot water piping systems are original. Given their age, they should also be replaced, but X-ray testing is recommended to confirm this observation.

Only the office area is air conditioned with window type air conditioners. All of the other areas are heating/ventilating units only.

Miscellaneous terminal heating equipment such as unit heaters, cabinet heaters and fin-tube radiation serve unoccupied spaces and are generally in fair condition.

The control system is a pneumatic type which appears to have been capable of minimal energy management such as day/night operation. The economic life span of a pneumatic control system is generally considered to be 20 to 25 years. An upgrade to a direct digital (DDC) system should be done to take advantage of the superior energy management technologies available through such systems.

The perimeter classroom areas of the building are served by traditional classroom unit ventilators with matching casework and sink/bubblers. Due to their age and space limitations, they should be replaced. Classrooms on the west side of the building are difficult to heat. The exhaust systems are inadequate, especially the units that serve the rest rooms and kitchen.

HVAC (continued):

Specific Areas and/or Systems:

Multi-Purpose: Two (2) heating-only air handling units mounted in a mechanical loft serve this space. These units are original to the building and should be replaced due to their age and inefficiency.

Offices: This area is served by fan coil units and window air conditioners with no ventilation into the spaces. The Conference Room has exhaust-only and no air conditioning. These units are in poor condition and should be replaced.

Plumbing:

Central Services: The Domestic Water is supplied via the municipal system; no reports of water pressure problems were received. The Sanitary Sewer System is also connected to the municipal system. The gas service is supplied by Equitable Gas.

Piping: The domestic water piping is original from 1965 and is showing signs of aging; it is recommended that it be replaced. The Sanitary Sewage System was reported to be working adequately.

Fixtures: The majority of the plumbing fixtures are in good to fair condition. The existing flush valves and faucets are manual and it was requested for the new flush valves and faucets to be an automatic type. New fixtures shall be added as necessitated by ADA requirements. Where new are installed, low flow-type should be utilized.

Equipment: The domestic water heater is a gas-fired water heater located in the Boiler Room. The hot water storage tank is original and most likely oversized and should be replaced. A thermostatic mixing valve for the hot water system exists on the outlet side of the hot water storage tank. Due to its age and condition, a new Domestic Hot Water System is recommended to be installed with thermostatic control valves to provide proper water temperature distribution throughout the facility.

Electrical:

Service: Duquesne Light Company serves the School. The service consists of a single pole-top transformer with underground service feeders to a service panel board in the basement Mechanical Room. The existing service is 120/240 volt, 800 amp, 1 phase, 3 wire. The power company records indicate a peak electrical demand of 69 KW in October of 2012, which would represent 191 amps.

Power: The existing main service panel board is 120/240v, 1 phase, 3 wire, Pow-R-Line manufactured by Eaton. The service panel is fed from an original Bulldog Clampmatic 800 amp service disconnect. The condition of the switchgear is very good. The original branch panels and feeders are in fair condition and should be replaced.

Emergency Generator: The existing 10 kW, natural gas emergency generator and transfer switch is manufactured by Dayton appears to be in good condition. The generator feeds life safety loads and miscellaneous mechanical circuits.

Lighting: The interior lighting fixture lamps and ballasts were converted to energy-saving T-8 lamps with electronic ballasts. The existing lighting consists of prismatic lensed fixtures and generally is in fair to good condition. A few fixtures will require replacement of damaged lenses. The existing exterior lights will need to be replaced. LED fixtures should be considered for reduced energy and maintenance. The exit signs are tritium wireless and should be replaced with LED hard wired type. Motion sensors are installed in the classrooms for lighting control.

PA / AV / Technology Systems: The PA/masterclock system consists of a TOA head end unit with push-to-call buttons and two-way speakers in the classrooms, and speakers in the corridors. The system is in good operating condition. An AV distribution system installed in the classrooms includes smart boards, and ceiling-mounted televisions and projectors; they appear to be functional. Through recent advancements in technology, upgrades to these systems should be considered by the school district.

Data/ Telephone: The data cabling infrastructure throughout the building was replaced with Category 5E cable. The cabling network has sufficient capacity to handle the data system requirements. Wireless access has been installed throughout the school. Advancements in technology within the last five to ten years have vastly improved the function and capabilities of these systems and replacement of these existing systems would improve the School District's operation.

Electrical (continued):

Fire Alarm/ Security: The fire alarm system is manufactured by Firelite and was upgraded to meet current ADA standards. Several security cameras are located on the exterior and interior of the building. Key fob / intercom access control (Airphone) exists at the main entrance and the rear entrance. The security is IP-based and controllable over the network / internet.

Building Security: The building's main entrance is monitored via a camera / intercom device (described above) that communicates with the office personnel who then remotely releases the locked door latch to permit visitors into the building. An interior vestibule should be considered so visitors are directed to the office when entering the building, without gaining access to the remainder of the building. Safety glass could also be considered at this vestibule and office reception area to further delay aggressive intruders. Several other exterior doors including the main entrance have keyless electronic door access installed permitting staff to enter by scanning a card or fob. Security cameras exist on the interior and exterior of the school. An intrusion detection (burglar) system does not exist at this facility.

ADA Compliance: The interior building's room identification signage, restroom clearances, and classroom door entry alcoves are items that would need to be upgraded in a renovation project to be code-compliant.

State Code Compliance: In general, the building complied with the applicable building codes when it was constructed and when it was renovated. Since the building was previously approved by prior building codes, it is considered a certified building. However, if renovations take place that are beyond cosmetic improvements, the changes within the renovation areas and any replaced building systems (fire alarm, emergency lighting, etc.) will be required to comply with the new requirements of the PA Uniform Construction Code.

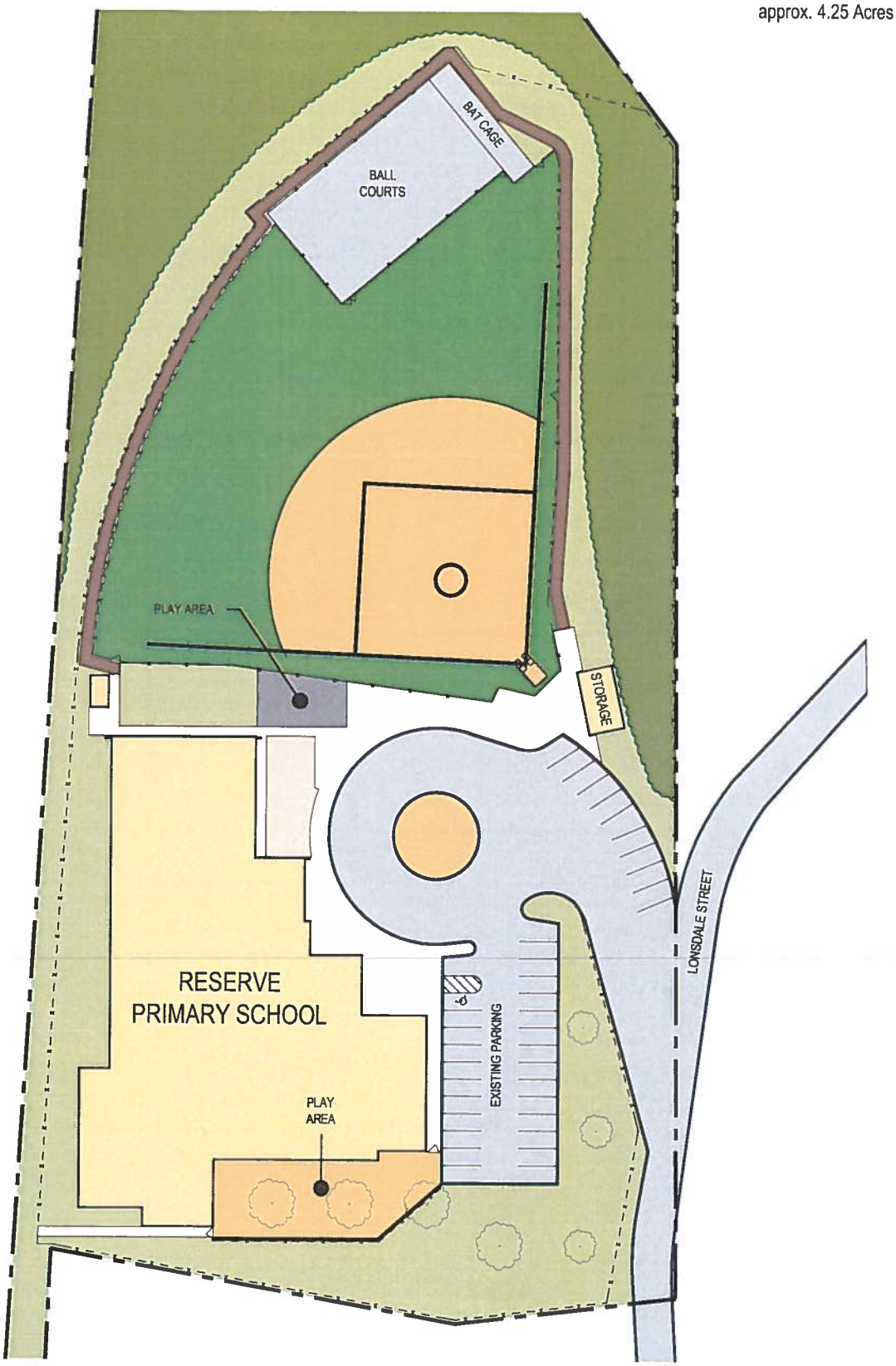
Asbestos: Many asbestos containing materials have been removed as part of a District-wide plan coordinated by the District's Environmental Consultant, CEOT, Inc. Both 9" x 9" and 12" x 12" floor tile and mastic as well as pipe insulation fittings in the Boiler Room and in select walls and ceilings still remain at this time. The acoustic wall panels in Rooms 108 and 304 should be tested also for asbestos.

Overall Building Condition: Fair to Poor.

RESERVE PRIMARY SCHOOL

EXISTING

approx. 4.25 Acres



SCALE: 1" = 80'-0"

SITE PLAN

Address: 201 Wetzel Road
Glenshaw, PA 15116

Constructed: 1955
Additions and Alterations: 1987
Alterations: 2003

Enrollment: 202 Students (K-3), 22½ Staff

Size: 30,440 sq. ft. on approx. 3.85 acres

Site: The site is situated within a residential neighborhood in the Glenshaw Community of Shaler Township on a small plot that slopes from east (high) to west (low) and adjoins the Township's Kiwanis Park (30.6 acres).

The asphalt parking lots and drives were selectively replaced and/or resurfaced less than 10 years ago and are in fair condition other than a few select areas needing repairs. The catch basins in the asphalt are showing signs of collapse at their perimeters and need to be rebuilt to provide adequate support for vehicle traffic. The concrete curbs and walks are cracking at several locations and need replaced to prevent tripping hazards.

Structure: The original single-story building is constructed on concrete spread footings with a combination of masonry bearing walls and steel columns supporting long span roof decking and steel roof joist. The 1987 classroom addition was constructed on a combination of concrete spread footings on lean concrete fill at incompetent soil conditions; and grade beams and caissons at the connection to the existing building. The roof structure is supported by steel joist bearing on steel beams and columns.

The exterior brick and mortar at many exterior windows and entrances is cracked and allowing water to penetrate the wall due to rusted and delaminating steel lintels. These lintels should be replaced and the brick repaired and/or replace above.

Roof: The roof was last replaced in 1997 with an adhered Firestone rubber EPDM membrane. The roof's insulation and metal fascia/coping were replaced at this time as well. The building's roof structure slopes to achieve positive drainage to its roof drains. The roof and associated components are in fair condition. Warranty has expired.

Windows: All of the windows throughout the building are in poor condition. There is visible daylight at the top of the aluminum framing above the ceilings in the classrooms allowing water and air to enter. The previously replaced (1987) porcelain enamel panels at the top of the windows have phenolic insulation behind them which is causing the steel panel to corrode.

Exterior Doors / Frames: The original building and addition's exterior hollow metal doors and frames were replaced during the 1987 renovations. These doors and frames are rusted and in need of replacement with a more durable finish such as a fiberglass reinforced panel (FRP) door with aluminum frames. The main entrance doors were later replaced in 2000 with aluminum doors and frames and are in good condition.

Interior Doors/ Hardware: The wood doors in the original building are worn and their knob-style locksets are not ADA compliant. Some lever type hardware exists on these doors in the office area. The plastic laminate clad wood doors and deadbolt latch/pull-style hardware in the addition are in fair condition, but also do not comply with code.

Interior Spaces: In general, the building is clean and well maintained.

Corridors: The VCT floors in the corridors are in fair condition. The corridor walls in the original building are structural glazed face tile and are concrete block in the addition's corridors. Both are in good condition. The 2 x 4 acoustic ceiling tile is also in good condition. A corridor ramp was added in 2003 at the addition to accommodate disable access to the upper level. The corridor lockers in the addition are in fair condition, but the lockers in the original building portion are in poor condition and are undersized for student use.

Classrooms / Instructional Spaces: Classroom finishes (VCT floor, painted walls, and 2 x 4 acoustic ceilings) are all in fair condition. The metal integral unit ventilator cabinets on the outside walls of the rooms are in poor condition and would require modification if UVs are replaced. The classrooms have a mix of chalk, marker, and smartboards throughout the building. Additional loose shelving, storage cabinets, and student cubbies are positioned throughout the rooms to accommodate the lack of storage in the spaces.

Library: The Library's furnishing (shelving, tables, chairs, etc.) are original to the 1987 addition and are in fair condition. The size of the room appears to be suitable for the building's users.

Cafeteria/ Gymnasium: The VCT floor, painted CMU walls, and acoustic ceiling is in fair condition. The room's walls are not protected with impact cushions for physical education activities. A lack of storage for gymnasium equipment exists, most noticeably during lunch when cafeteria tables are in place.

Kitchen: The kitchen is only useable as a re-heat/satellite facility due to its small size. The vertical ovens and upright cooler/freezer are newer pieces of equipment, but are undersized for large serving events and extended cold storage periods. The ventilation system/hood is not adequate if other cooking options are introduced, as currently only a 4 burner electric residential range accommodates this function.

Interior Spaces (continued):

Office: The office suite is very small to handle daily school operations such as file storage, visitors, private meetings, and staff and student traffic. The nurse's suite (across the main lobby from the office) is also small and does not have an exam area, office, or storage for the space. The finishes within these suites are worn due to their age and frequent use.

Restrooms: The boys and girls gang restrooms are arranged in a fashion that does not promote good supervision and does not permit circulation of users within the tight space. Adequate clearances cannot be obtained with this arrangement to suit current ADA requirements. The toilet partitions are newer, but the floors (quarry tile), walls (SGFT), and ceilings are all original and need replaced. One kindergarten room (of two) has a single use toilet room for student use.

HVAC:

Existing Systems: Two (2) gas-fired, Peerless boilers exist, and were replaced in 1987. They need to be upgraded to avoid costly maintenance repairs and capture some energy savings.

Two (2) original inline pumps serving the heating water systems exist. They are constant volume. Given their age and availability of parts, they should be replaced.

The hot water piping systems are original and are located in the slab below the floor. Given their age and history of reported leaks they should be replaced.

Only the office area is air conditioned (with reported problems) with split system type air conditioners. All of the other areas are heating/ventilating units only.

Miscellaneous terminal heating equipment such as unit heaters, cabinet heaters and fin-tube radiation serve unoccupied spaces and are generally in fair condition.

The control system is a Honeywell pneumatic type which appears to have been capable of minimal energy management such as day/night operation. The economic life span of a pneumatic control system is generally considered to be 20 to 25 years. An upgrade to a direct digital (DDC) system should be done to take advantage of the superior energy management technologies available through such systems.

The perimeter classroom areas of the building are served by traditional classroom unit ventilators with integral cabinets and sinks with bubblers. Due to their age and replacement and part availability, they should be replaced.

HVAC (continued):

Specific Areas and/or System:

Multi-Purpose: Four (4) heating-only floor mounted unit ventilators serve this space. These units are original and should be replaced.

Offices: This area is served by split-system air conditioners with no ventilation into the spaces. These units are in poor condition and should be replaced.

Plumbing:

Central Services: The Domestic Water is supplied via the Municipal system. No reports of water pressure problems were documented. The Sanitary Sewer System is connected to the municipal system. The gas service is supplied by Equitable Gas to the building.

Piping: The domestic water piping is original from 1955 and is showing signs of aging. Due to its age, it is recommended that this piping be replaced. The Sanitary Sewage System was reported to have clogging and slow draining issues.

Fixtures: The majority of the plumbing fixtures are in good to fair condition. The existing flush valves and faucets are manual and it was requested for the new flush valves and faucets to be automatic type. New fixtures are needed to meet ADA requirements. Where new are installed, low flow type shall be utilized.

Equipment: The domestic water heater is a gas-fired American Standard water heater located Boiler Room. The hot water storage tank is original and oversized and should be replaced. There is an existing thermostatic mixing valve for the hot water system on the outlet side of the hot water storage tank. Due to its age and condition, a new Domestic Hot Water System is recommended to be installed with thermostatic control valves to provide proper water temperature distribution throughout the facility.

Electrical:

Service: The Power Company serving the School is Duquesne Light Company. The service consists of three 25KVA pole top transformers with overhead service feeders to a building mounted weather head. The existing service is 208Y/120 volt, 800 amp, 3 phase, 4 wire. The power company records indicate a peak electrical demand of 54 KW in January of 2013, which would represent 150 amps.

Power: The existing main distribution panel board was manufactured by General Electric. It is a Spectrum Series panel board with high break APN style circuit breakers. The main distribution switchboard has an 800 ampere main breaker. The condition of the switchgear appears to be very good.

Emergency Generator: The existing 10 kW, natural gas emergency generator and transfer switch is manufactured by Dayton appears to be in good condition. The generator feeds life safety loads and miscellaneous mechanical circuits.

Lighting: The interior lighting fixture lamps and ballasts were converted to energy-saving T-8 lamps with electronic ballasts. The existing lighting consists of prismatic lensed fixtures and generally is in fair to good condition. A few fixtures will require replacement of damaged lenses. The existing exterior lights will need to be replaced. LED fixtures should be considered for reduced energy and maintenance. The exit signs are tritium wireless and should be replaced with LED hard wired type. Motion sensors are installed in the classrooms for lighting control.

PA/AV/ Technology Systems: The PA system consists of a Bogen head end unit with push to callbuttons and two way speakers in the classrooms and speakers in the corridors. The system is in good operating condition. There is an AV distribution system installed in the classrooms that include smart boards, ceiling mounted televisions and projectors, and the systems appear to be functional. Through recent advancements in technology, upgrades to these systems may be considered by the school district.

Data/ Telephone: The data cabling infrastructure throughout the building was replaced with Category 5E cable. The cabling network has sufficient capacity to handle the data system requirements. Wireless access has been installed throughout the school. The telephone system consists of an Alcatel Lucent IP touch system. Advancements in technology within the last five to ten years have vastly improved the function and capabilities of these systems and replacement of these existing systems would improve the School District's operation.

Electrical (continued):

Fire Alarm/ Security: There were modifications to the existing fire alarm system; however, the fire alarm system needs to be upgraded to meet current ADA standards. There is several security cameras located on the exterior and interior of the building. There is key fob/ intercom access control (Aiphone) at the main entrance and the rear entrance. The security is IP based and controllable over the network/ internet.

Building Security: As described above, the main building entrance has an intercom and security camera with an electric door release that lets the office staff communicate with visitors and let them into the building. A secure vestibule area adjacent to the school office with locked doors and safety glass should be considered to control visitors. Other miscellaneous exterior doors have a keyless entry system installed, which permits staff to enter the building while being monitored by a central computer server. The interior and exterior of the building is equipped with security cameras, but an intrusion detection system is not present.

ADA Compliance: The building's north exit has stairs positioned inside that prevent a disabled person exiting the building during an evacuation. A lift or ramp should be installed to accommodate these users. The existing corridor ramps also may exceed ADA slope limitations and should be further evaluated. The buildings gang and single use restrooms do not provide adequate turning radii in stalls and entrances; and properly installed grab bars need repositioned. Tactile room signage also needs addressed throughout the building.

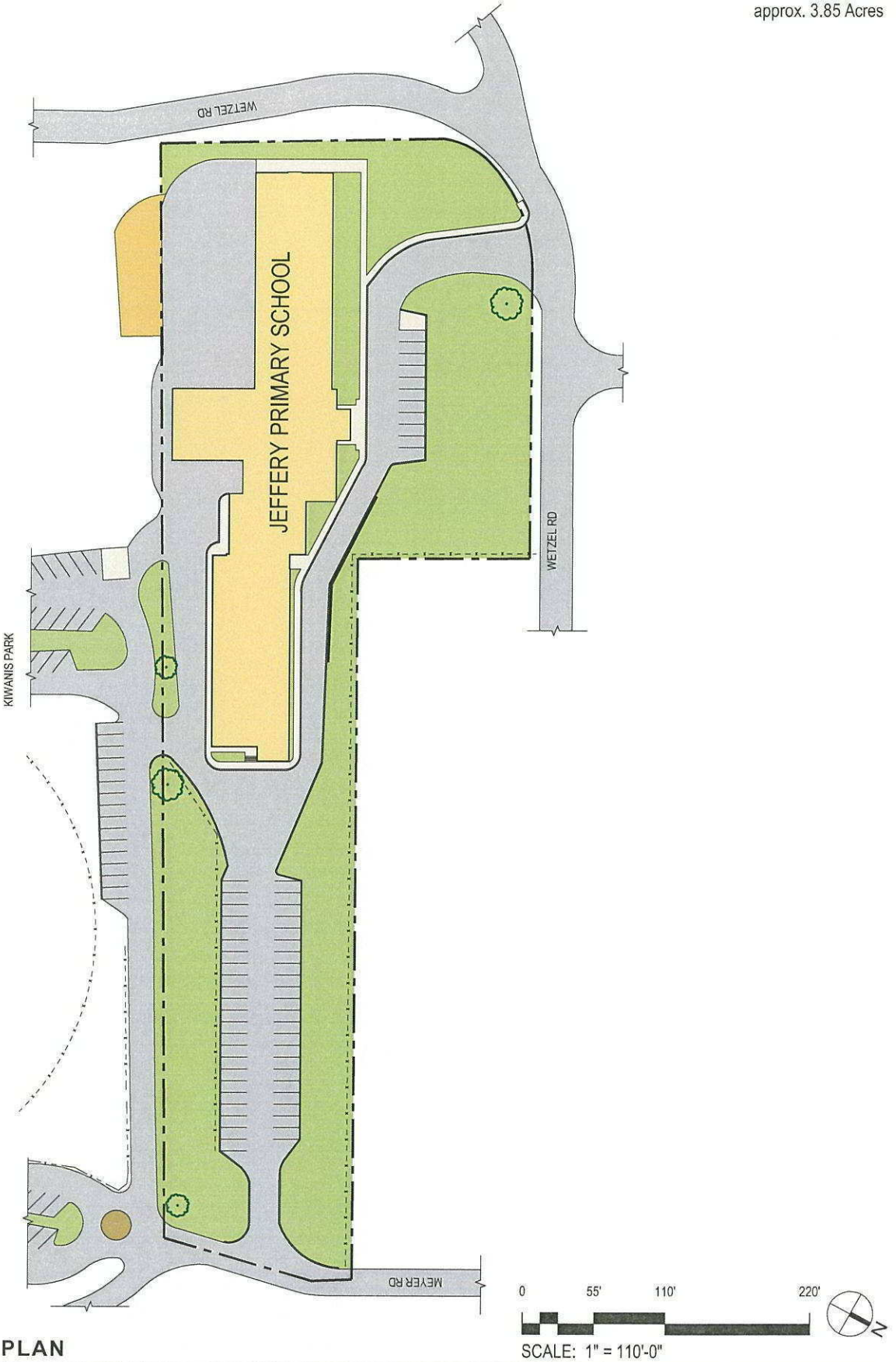
State Code Compliance: The facility complied with building codes in effect when the building was constructed and renovated in the past and is therefore certified to exist in its current state (excluding federal accessibility guidelines, which still need corrected). If alterations were to occur in the building, the altered areas and systems as well as the path to altered areas must be brought up to today's current building code.

Asbestos: Although some asbestos abatement has occurred in the building, some asbestos containing materials are still present. 9"x9" and 12"x12" vinyl asbestos floor tile (VAT) and mastic still exist in various areas throughout the building (gymnasium, lobby, classrooms, etc.) and wall and ceiling plaster. Asbestos fiberglass pipe fittings in the boiler room, gang restrooms, corridors, and other hidden areas are also suspect and require further testing.

Overall Building Condition: Fair to Poor

EXISTING

approx. 3.85 Acres



SITE PLAN

SCALE: 1" = 110'-0"

Address: 705 Scott Avenue
Glenshaw, PA 15116

Constructed: 1960
Additions and Alterations: 1967
Alterations: 1987

Enrollment: 192 Students (K-3), 21½ Staff

Size: 34,940 sq. ft. on approx. 9.45 acres

Site: The building is situated on a relatively flat plateau and located across the street from Shaler Area Elementary School, in a residential neighborhood known as the Glenshaw Community of Shaler Township. Ball fields exist on the site and located to the south of the building on a lower portion of the property.

The asphalt parking lots and drives were resurfaced when the west parking lot was added in 1999. There are many areas in the paving surface that are showing signs of cracking and distress that will require replacement. Several catch basin tops have been repaired and reset due to erosion and settlement, but others still remain that need replaced. The concrete walks and curbs are in fair condition. The 10' long concrete retaining wall adjacent to the lower 1967 addition entrance is in poor condition and needs replaced.

Structure: The original building's roof is constructed of steel columns and beams at the exterior walls and masonry bearing corridor walls which carry poured gypsum concrete on long span deck. Steel joist span the cafeteria and gymnasium space, resting on masonry bearing walls. Concrete spread footings support these structural elements in the original building. The 1967 addition's roof and first floor is constructed of steel columns and beams with steel deck and steel joist that bear on a combination of concrete grade beams and caissons (at the basement) and spread footings (at the crawl space).

The exterior brick at the roof chimney needs repointed and/or replaced due to water penetrating the veneer from the top stone cap. An exterior retaining wall needs to be replaced.

Roof: The roof was replaced in 2002 with a new Carlisle adhered rubber (EPDM) membrane on new rigid insulation. The roof's metal edging was also replaced at this time. The roof is in good condition. A lighting protection system exists on the boiler stack /chimney. The warranty expires August 22, 2022.

Windows: Windows were replaced in 2008.

Exterior Doors / Frames: Many of the exterior doors and frames at this building are rusting and are in poor condition and should be replaced. Only a couple have been recently replaced with an FRP (fiberglass reinforced panel) type door which are in good condition.

Interior Doors/ Hardware: All of the interior wood doors and knob-type lockset hardware is original to the 1960 building and 1967 addition. These doors are worn due to their age and the hardware is not ADA complaint. The doors should be replaced and lever-type hardware installed.

Interior Spaces:

Corridors: The vinyl tile throughout the building is original to the building, and in poor condition. The tile contains asbestos and is worn to the point of replacement. The SGFT walls with painted plaster above are in fair condition and the 2 x 4 acoustic ceiling is also in fair condition. The original corridor lockers are undersized for student use and in poor condition due to their age and use. If they are to be utilized for future student storage, they should be considered for replacement. The railing in the stairs which lead to the basement do not comply with today's building codes due to their open guard arrangement and need addressed if the building is considered for improvements.

Classrooms / Instructional Spaces: Similar to the corridors, the classroom floor tile is original, worn, contains asbestos, and should be replaced. The 2 x 4 acoustic ceiling and painted plaster walls are in fair condition. The metal storage shelving along the outside wall is attached to the heating/venting unit (UV) in the room and most likely needs modified and/or replaced if the UV is upgraded with new. Storage is lacking in the classrooms as teachers utilize standing cabinets and shelving, reducing space for regular classroom instruction. A combination of chalk, marker, and smart boards are installed in the various classrooms in the building.

Library: The Library' equipment (tables, chairs, shelving, etc.) is original to the 1967 addition and is in fair condition. The vinyl tile flooring is in poor condition and the painted plaster walls and acoustic ceilings are in fair condition. The Library appears to be adequate in size for its instruction purpose.

Cafeteria/ Gymnasium: The vinyl tile in the cafeteria and gymnasium is original to the building and is in poor condition. The painted plaster walls and the 2 x 4 acoustic ceilings are in fair condition. Aside from the acoustic ceiling, there are no other acoustic treatments in the space to assist in controlling sound during noisy events. Wall impact cushions on the walls do not exist to protect students during physical education activities. Storage of tables/chairs and athletic equipment is needed during times when the space is utilized for lunch or gym activities.

Kitchen: Although the kitchen is somewhat larger than some of the other Primary Centers, it is still cramped due to the additional equipment that is positioned in the room. A larger serving counter which possibly serves two lines exists, but restricts space for the other kitchen equipment such as the newer upright cooler and freezer. The ventilator hood is positioned above the original combination cooker / kettle, convection oven, and range which does not provide adequate ventilation or fire suppression capabilities. A dry storage room and staff locker / toilet room also exists in the space. The 2" x 2" quarry tile floor, SGFT walls, and painted plaster ceiling are in fair condition.

Office: The office suite positioned near the main entrance is undersized. The visitor reception/secretary, nurse, and principal (across the lobby) are all arranged in this area and lack the storage and space to conduct daily operations efficiently. Some original vinyl flooring has been removed in this area and carpet reinstalled, which is now worn due to foot traffic. The painted plaster walls and 2 x 4 ceilings are in fair condition.

Restrooms: The 2 sets of gang restrooms have an ample amount of fixtures (sinks, toilets, and urinals) but the space within the rooms is tight for its users. The clearances at the fixtures and doors do not comply with code. The quarry tile floor, SGFT walls, and painted plaster ceilings are in fair condition. None of the kindergarten rooms have a single use toilet room for student use during classroom instruction.

HVAC:

Existing Systems: Two (2) original, gas-fired, Bryan tube type boilers exist. They need to be upgraded due to their age and parts availability.

Two (2) original, base-mounted pumps serve the heating water systems. They are constant volume. Given their age they should be replaced. The hot water piping systems are also original and X-ray testing is recommended to confirm if this piping can be reused.

Only the office area is air conditioned with window type air conditioners. All of the other areas are heating/ventilating units only.

Miscellaneous terminal heating equipment such as unit heaters, cabinet heaters and fin-tube radiation serve unoccupied spaces and are generally in fair condition.

The control system is a Honeywell pneumatic type which appears to have been capable of minimal energy management such as day/night operation. The economic life span of a pneumatic control system is generally considered to be 20 to 25 years. An upgrade to a direct digital (DDC) system should be done to take advantage of the superior energy management technologies available through such systems.

The perimeter classroom areas of the building are served by traditional classroom unit ventilators built-in with sinks and bubblers. Due to their age and repair difficulties they should be replaced.

HVAC (continued):

Specific Areas and/or Systems:

Multi-Purpose: Three (3) heating-only floor mounted unit ventilators serve this space. These units are building original and should be replaced.

Offices: This area is served by window air conditioners with no ventilation into the spaces. These units are in poor condition and should be replaced.

Kitchen: A makeup air unit is needed to address the poor performance of the ventilator hood.

Plumbing:

Central Services: The Domestic Water is supplied via the Municipal system. No reports of water pressure problems were given. The Sanitary Sewer System is connected to the municipal system. Equitable Gas supplies the service.

Piping: The domestic water piping is original from 1960 and is showing signs of aging. Due to its age, it is recommended that to be replaced or at least X-ray tested to determine its condition. The Sanitary Sewage System was reported to be working adequately.

Fixtures: Most of the plumbing fixtures are in good to fair condition. The existing flush valves and faucets are manual and it was requested for the new flush valves and faucets to be automatic type. New fixtures are needed to meet ADA requirements. Where new are installed, low flow type shall be utilized.

Equipment: The domestic water heaters are gas-fired, located in the Boiler Room. A thermostatic mixing valve exists for the hot water system on the outlet side of the hot water storage tank. Due to its age and condition, a new Domestic Hot Water System is recommended to be installed with thermostatic control valves to provide proper water temperature distribution throughout the facility.

Electrical:

Service: The Power Company serving the School is Duquesne Light Company. The service consists of three pole mounted transformers with underground service feeders to the building. The existing service is 208Y/120 volt, 800 amp, 3 phase, 4 wire. The power company records indicate a peak electrical demand of 58 KW in April of 2013, which would represent 161 amps.

Power: The existing main distribution panel board was manufactured by General Electric. It is a Spectrum Series panel board. The main distribution switchboard has an 800 ampere main breaker. The condition of the switchgear appears to be good. Most of the branch panel boards are original. However, there have been some panel boards installed more recently.

Emergency Generator: The existing 5 kW, natural gas emergency generator is old, appears to be in poor condition, and should be replaced. The existing ASCO transfer switch should also be replaced. The generator feeds all of the building's life safety loads.

Lighting: The interior lighting fixture lamps and ballasts were converted to energy-saving T-8 lamps with electronic ballasts. The existing lighting consists mostly of prismatic lensed fixtures as well as parabolic fixtures. Generally the lighting throughout the building is in fair to good condition. A few fixtures will require replacement of damaged lenses. The exit signs are incandescent and should be replaced with LED type. The existing exterior lights are in fair condition. The wall mounted fixtures are older and may need to be replaced. LED fixtures could be considered for reduced energy and maintenance.

PA / AV / Technology System: The PA system consists of a Bogen head-end unit with speakers in the classrooms and in the corridors. The system is in good operating condition. Televisions and projectors exist in most classrooms and appear to be functional. Due to recent advancements in technology, the District should consider upgrades.

Data/ Telephone: The data cabling infrastructure throughout the building was upgraded and replaced with Category 5E cable during a project in 2001. The cabling network has sufficient capacity to handle the data system requirements. Wireless access has been installed throughout the school. The telephone system consists of an Alcatel Lucent IP touch system. Advancements in technology within the last five to ten years have vastly improved the function and capabilities of these systems and replacement of these existing systems would improve the School's operation.

Fire Alarm/ Security: The existing Simplex fire alarm system was upgraded with a new 4001 panel, however there still may need to be some upgrades to meet current ADA standards. Several security cameras are located on the exterior and interior of the building. A key fob / intercom access control (Aiphone) exists at the main entrance and the rear entrance. The door access security is IP based and controlled over the network / internet.

Building Security: As stated above, the main entrance doors have an intercom, camera and door release for the office staff to permit visitors to enter the building. A secure vestibule with safety glazing which directs visitors to the office without gaining access to the school should be considered to control visitors. Electronic door access is also installed at one rear door. Interior and exterior cameras exist throughout and around the building, and an intrusion detection system is not present.

ADA Compliance: The location of the instructional classrooms (Art, Music, and Computer Lab) in the basement do not permit a disabled person to use these spaces since they are only accessible via the interior stairs. An elevator needs to be installed to gain access to these areas, or they need to not be used in the school's instructional program. Classroom door entrances and gang / single use restrooms do not have adequate clearances to met Federal ADA Requirements. Room signage should include tactile braille to satisfy code also.

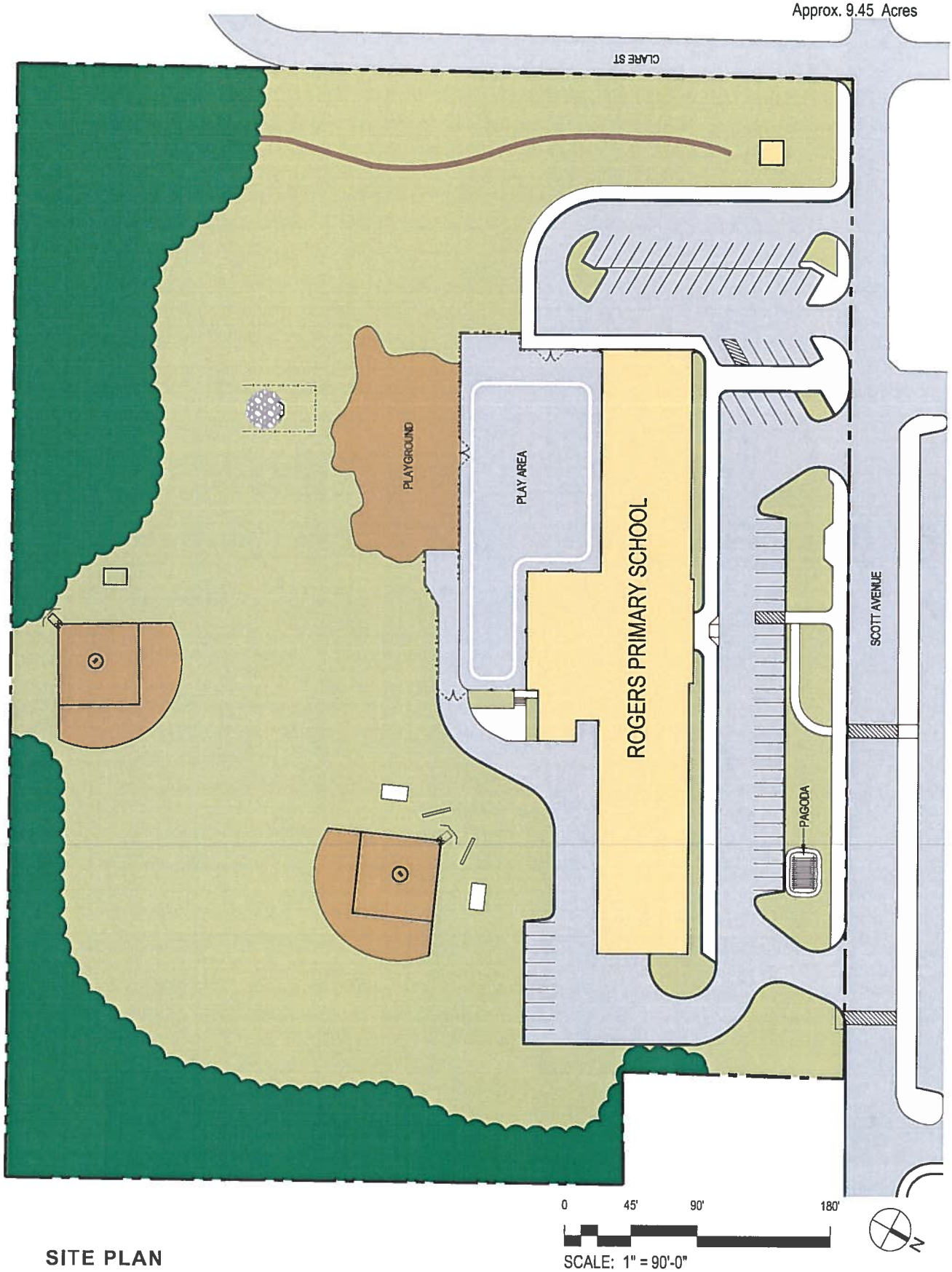
State Code Compliance: The building meets the applicable requirements of the state building code with it was constructed, therefore it is 'grandfathered' or certified for use in its current condition. If renovations occur at this facility, then the alterations and/or additions (including an unobstructed path to the areas), needs to meet all requirements of today's code.

Asbestos: A significant amount of 9" x 9" and 12" x 12" asbestos containing floor tile and mastic exists in the building, even though some areas were abated as recently as 2007. Boiler breeching, hot water boiler tubing, and pipe insulation fittings in chases also are likely asbestos containing in the facility.

Overall Building Condition: Fair to Poor.

EXISTING

Approx. 9.45 Acres



SCALE: 1" = 90'-0"

SITE PLAN

Address: 101 Marzolf Road Extension
Pittsburgh, PA 15209

Constructed: 1968
Additions and Alterations: 1987

Enrollment: 349 Students (K-3), 44 Staff

Size: 51,825 sq. ft. on approx. 9 acres

Site: The site is situated in Shaler Township, on a gradually sloping site. A ballfield is positioned to the west of the school and additional parking (converted from a play area in 1998) is located at the rear, lower portion of the site.

The asphalt drives and parking areas which were partially resurfaced in 1998 with recycled asphalt (as reported) are cracking and in poor condition. The concrete walks and curbs are also cracking and in poor condition.

Structure: The 1968 original building is a 2-story steel framed structure with steel joist and metal deck supporting the upper floor and roof. The structure bears on concrete spread footings below the lower floor which is partially crawl space at the front of the building. The 1987 addition is constructed on concrete grade beams and caissons at the rear of the addition and concrete spread footings on lean concrete at the front. Steel columns and beams support a composite concrete slab on metal deck at the first floor while steel joist and metal deck support the roof.

Perimeter leaks were reported at the addition's below grade classrooms and below the addition's front entrance, likely due to the absence of a waterproofing membrane on the exterior concrete wall. There are several window and door openings with rusting lintels causing exterior brick wall damage above. The chimney stack also has damage from a recent lighting strike that has caused brick and mortar to crack which likely is associated with water entering through the exterior brick wall.

Roof: The roof was replaced with a Carlisle adhered rubber membrane (EPDM) in 2002 and is in good condition. Tapered insulation (to provide positive drainage to roof drains) and all metal edging and coping was replaced at this time also. A roof/wall leak was reported at the East side of the high Gymnasium roof. The warranty expires August 26, 2022.

Windows: All of the existing windows that were replaced in 1987 are in poor condition. They contain phenolic insulation behind the upper, solid, metal panels which are corroding due to the reaction between the insulation and steel panel. The windows also leak air and water into the interior spaces.

Exterior Doors / Frames:

The original building and addition's hollow metal exterior doors and frames are rusted and need replaced. Only the rear, lower classroom exit doors were more recently replaced with an FRP (fiberglass reinforced panel) door.

Interior Doors/ Hardware:

Most of the original building's interior doors are wood and have knob-type hardware installed on them. Some of the doors have had lever type hardware installed making them ADA compliant, but the wood doors are still worn due to their age. The addition's interior classroom doors are plastic laminate with a deadbolt latch and pull hardware, which also are not ADA compliant.

Interior Spaces:

Corridors:

The corridors in the existing building have terrazzo floors, ceramic tile walls, and 2'x4' acoustic ceiling tiles. The terrazzo floors and tile walls are in fair condition, but the lay-in ceilings are sagging and need replaced. Likewise, the 2'x4' ceilings in the addition are also in poor condition, as well as the VCT floors which are delaminating from the concrete floor below.

The addition's corridor walls are painted concrete block, which are in good condition. Corridor lockers only exist in the addition's hallways which are in fair condition. If the lockers are to be reused as part of a building renovation project, they should be electrostatically painted and new hardware installed. The east ends of the corridors on the ground and first floors of the original building are 'dead-end' corridors and do not provide a code required exit path for building occupants. A direct exit path to the outside via a corridor and/or stair and exterior doors is required to satisfy the code. The building stairwell's hand and guardrails also do not comply with code due to their mounting heights and openness of the guard enclosure.

Classrooms / Instructional:

The vinyl tile floors, painted plaster walls and acoustic ceiling tile in the original classrooms are worn and in poor condition. The VCT floors, painted CMU walls and ceiling tile in the building addition are also in poor condition due to their age. All the classrooms have shelving that is attached to the rooms' heating/venting unit (UV) on the outside wall within the room, which would need to be replaced if the UV is replaced. Chalkboards, markerboards, and tackboards exist in all the classrooms and are in fair condition. Student lockers are installed within the original classrooms which are unusable due to their age and condition. Built-in student wardrobe cubbies or additional storage cabinets should replace these outdated locker banks.

Library:

The library's furnishings were replaced in 1987 when the building was renovated and are in fair condition. It appears the size of the library is small for the building's student capacity and today's computer media technology needs.

Interior Spaces (continued):

Cafeteria/ Gymnasium Stage: The multi-purpose room's floor is vinyl tile and is in poor condition due to its age. The SGFT walls with painted plaster above and 2'x4' acoustic ceiling tile is in fair condition.

The lay in-tile ceiling is installed below the roof's structure, and due to the low height, does not permit gymnasium events to occur without ceiling damage.

Wall impact cushions should also be installed on the walls to protect students from protruding wall obstructions (UV's, doorknobs, etc.). A fabric curtain divides the room during stage/lunch and gymnasium events.

The platform stage is only elevated by three (3) steps and has a single proscenium curtain for use during performances.

Kitchen: The kitchen has vinyl floor tile and ceramic wall tile which is original and chipped from damage. The painted plaster ceiling is in fair condition. The size of the kitchen appears to be adequate to serve the building's population, but cold food storage is limited to upright freezers and refrigerators. Food is prepared off-site and delivered to this facility to be reheated on a mix of old and newer pieces of kitchen equipment.

Offices: The Office and Nurse's suites are adequately sized, but is located down the corridor away from the main building entrance. The office should be positioned adjacent to the entrance to permit proper control of building visitors and supervision of daily school activities. The finishes within the office were updated in 1987 and are in fair condition.

Restrooms: The restroom's finishes (terrazzo floors, ceramic tile walls, and painted plaster ceilings) are in fair condition. The gang student restrooms are large enough to accommodate changes to the stall sizes to provide compliance with the ADA guidelines. Only one (1) set of these restrooms exist in the building to serve the building's students and only one (1) kindergarten classroom has a single-use toilet installed within it.

HVAC:

Existing Systems:

The HVAC system is a two-pipe type hot water distribution system. Two (2) gas-fired, Patterson Kelly boilers exist, both replaced in 2001.

One (1) base-mounted pump serves the heating water systems; they are constant volume and are original. Given their age they should be replaced.

The hot water piping systems are original. Given their age, they should be replaced, but X-ray testing is recommended to confirm this observation.

The only areas that are air conditioned are the office area, Art Room, A/V Room and a few rooms in the lower level. All of the other areas are heating/ventilating units only.

Miscellaneous terminal heating equipment such as unit heaters, cabinet heaters and fin-tube radiation exist and serve unoccupied spaces. These are generally in fair condition.

The control system is a Honeywell pneumatic type which appears to have been capable of minimal energy management such as day/night operation. The economic life span of a pneumatic control system is generally considered to be 20 to 25 years. An upgrade to a direct digital (DDC) system should be done to take advantage of the superior energy management technologies available through such systems.

The perimeter classroom areas of the building are served by traditional classroom unit ventilators with matching casework. Due to their age and serviceability they should be replaced.

Specific Areas and/or Systems:

Multi-Purpose: Three (3) heating-only floor mounted unit ventilators serve this space. These units are building original and should be replaced.

Offices: This area is served by a single roof top unit and one window unit air conditioner. These units are in poor condition and should be replaced.

Plumbing:

Central Services: The Domestic Water is supplied via the Municipal system. No reports of water pressure problems were given. The Sanitary Sewer System is connected to the municipal system. The gas service is supplied by Equitable Gas to the building.

Piping: The domestic water piping is original from 1968 and is showing signs of deterioration. Due to its age, it is recommended that it be replaced. The Sanitary Sewage System was reported to be having issues.

Fixtures: The majority of the plumbing fixtures are in good to fair condition. The existing flush valves and faucets are manual and it was requested for the new flush valves and faucets to be an automatic type. New fixtures will be required to meet ADA requirements. Where new are installed, low flow-type shall be utilized.

Equipment: The domestic water heater is a gas-fired water heater located in the Boiler Room. The hot water storage tank is original and oversized and should be replaced. An existing thermostatic mixing valve for the hot water system exists on the outlet side of the hot water storage tank. Due to its age and condition, a new Domestic Hot Water System is recommended to be installed with thermostatic control valves to provide proper water temperature distribution throughout the facility.

Electrical:

Service: The Power Company serving the School is Duquesne Light Company. The service consists of three 50KVA pole top transformers with underground service feeders to a service panel board in the basement mechanical room. The existing service is 209Y/120 volt, 600 amp, 3 phase, 4 wire. The power company records indicate a peak electrical demand of 100 KW in January 2013, which would represent 278 amps.

Power: The existing main service panel board is 120/208v, 1 phase, 3 wire, Pow-R-Line manufactured by Eaton. It was reported that the main service's underground conduit frequently leaks water into the building during rain events. This condition should be addressed to prevent a future hazard. The main distribution switchboard has a 600 ampere adjustable trip main breaker.

The condition of the switchgear is very good. The original branch panels and feeders are in fair condition, but should be replaced due to their age. Additional panels and feeders were added in 2000 for technology loads. Circuit breakers in the kitchen panel board tend to trip. Additional dedicated circuits should be added for the kitchen equipment.

Electrical (continued):

Emergency Generator: The existing 10 kW, natural gas emergency generator and transfer switch is manufactured by Dayton and appears to be in good condition. The generator feeds life safety loads and miscellaneous mechanical circuits.

Lighting: The interior lighting fixture lamps and ballasts were converted to energy-saving T-8 lamps with electronic ballasts. The existing lighting consists of prismatic lensed fixtures and generally are in fair to good condition. A few fixtures will require replacement of damaged lenses. The existing exterior lights will need to be replaced. LED fixtures should be considered for reduced energy and maintenance. The exit signs are tritium wireless and should be replaced with LED hard wired type. Motion sensors are installed in the classrooms for lighting control.

PA / AV / Technology System: The PA/master clock system consists of a TOA head end unit with push-to-call buttons and two way speakers in the classrooms, and speakers in the corridors. The system is in good operating condition. There is an AV distribution system installed in the classrooms that include smart boards, ceiling mounted televisions and projectors, and the systems appear to be functional. Through recent advancements in technology, upgrades to these systems should be considered by the school district.

Data/ Telephone: The data cabling infrastructure throughout the building was replaced with Category 5E cable. The cabling network has sufficient capacity to handle the data system requirements. Wireless access has been installed throughout the school. Advancements in technology within the last five to ten years have vastly improved the function and capabilities of these systems and replacement of these existing systems would improve the School District's operation.

Fire Alarm/ Security: The fire alarm system was upgraded to meet current ADA standards. There are several security cameras located on the exterior and interior of the building. There is key fob/ intercom access control (Aiphone) at the main entrance and the rear entrance. The security is IP based and controllable over the network/ internet.

Building Security: As previously started, the main office is not positioned near the main entrance to properly monitor visitors and the front of the building. An intercom with a camera is installed at this entrance to observe and communicate with visitors who then gain access to the building's corridors once they are permitted to enter. Other exterior doors have door access hardware installed that permits staff to access the building with a fob/card swipe. Security cameras are strategically positioned around and within the building, but an intrusion detection system is not installed. The Office and security entrance for visitors need to be redesigned to control visitors entering the building.

ADA Compliance: The elevator that serves the ground and first floors needs to upgraded to comply with newer control panel height requirements, firemen's recall, and fire alarm system integration. The building's only single gang restrooms need reorganized by increasing space within toilet stalls, fixtures, and doors; and handicap grab bars installed. Doors at classroom entrances also don't have the proper push/pull clearance widths necessary for a disabled person to approach and use the door. Tactile signage needs installed on all rooms within the building to satisfy ADA guidelines.

State Code Compliance: In general, the building complied with the applicable building codes when it was constructed and when it was renovated. Since the building was previously approved by prior building codes, it is considered a certified building. However, if renovations take place that are beyond cosmetic improvements, the changes within the renovation areas and any replaced building systems (fire alarm, emergency lighting, etc.) will be required to comply with the new requirements of the PA Uniform Construction Code.

Asbestos: Many rooms in the building contain vinyl asbestos tile and mastic. There may also be pipe fittings that are concealed within ceilings and walls that are only accessible for abatement if these building elements are demolished.

Overall Building Condition: Fair to poor.

EXISTING

approx. 9 Acres

SITE PLAN

SCALE: 1" = 110'-0"

Address: 1500 Burchfield Road
Allison Park, PA 15101

Constructed: 1964
4 Classroom Addition: 1968
4 Classroom/Multi-Purpose Rm. Addition and Alterations: 1971
Alterations: 1987

Enrollment: 376 Students (K-3), 45 Staff

Size: 84,595 sq. ft. on approximately 10.75 acres

Site: The school is situated on a gently sloping site in a residential neighborhood located in Shaler Township. A softball field, Little League baseball field, concession stand, restroom, and playground are located at the southern rear, lower portion of the site at the back of the building.

The asphalt drives, parking lots, and wedge curbs were replaced in 2002, but certain areas are showing signs of deterioration. The wearing course of some of these areas can be milled and resurfaced to restore their condition, but other areas at the front of the building need both the wearing and binder courses replaced down to the stone sub-base due to the depth of the cracks. Several storm inlets have been rebuilt recently but others still require repairs. Many new concrete sidewalks and cubs added in 2002 are in good condition but the original curbs and walks that remained are in poor condition and now need replaced. The chain link fence and site handrails are in fair condition.

Structure: The original 1964 building is constructed with concrete spread footings and column pads with steel columns and beams supporting the 1st floor steel joist and steel purlin pitched roof construction. The 1971 gymnasium / classroom wing is constructed on concrete grade beams and caissons with steel columns and beams supporting steel joists at the 1st floor and roof.

The masonry brick veneer is in fair condition around the exterior of building. The main entrance canopy's steel columns are rusting at their bases, and are in need of grinding / re-plating and/or repainting to restore their structural integrity. Sub-grade wall leaks were reported near the boiler room that were attempted to be repaired with new exterior waterproofing. It is uncertain at this time if repairs were successful.

Roof: The Firestone adhered EPDM rubber membrane on the flat portions of the building's roof was installed in 1997 and is in fair condition. The warranty expires September 11, 2017. Phenolic roof insulation was removed during this roof replacement project along with damaged steel deck, and replaced with new. Roof joists are sloped at these 'flat' roof sections to promote positive water drainage to roof drains. The metal mansard roof around the 1971 roof over the additions was repainted in 1997 also. The 1987 metal standing seam pitched roof over the majority of the original portion of the building was repainted along with the soffits and fascias in 2000.

Roof (continued):

A leak exists on this pitched roof at the front wall of the upper gymnasium. Above the pedestrian traffic areas, snow guards should also be added on the pitched roofs to prevent falling snow and ice. Although gutters were replaced in 2012, the metal roof, in general, is in fair to poor condition.

Windows:

The building's exterior windows leak air and water at their perimeter and are in poor condition. The aluminum windows are original in the 1971 wing of the building but the windows were replaced in 1987 in the remainder of the original 1964 building. These windows, similar to the other buildings in the District, contain phenolic insulation in their solid panels, which are deteriorating beyond repair. The maintenance staff has replaced and repaired several of the panels but many still need addressed.

Exterior Doors / Frames:

The main building's aluminum entrance vestibules are original and contain single glazed glass which leak air and water and offer no insulation from the exterior environment. These entrances should be replaced with new, insulated, aluminum framed entrances. The fiberglass reinforced doors at these entrances (and select other building entrances) are in good condition, but others still contain the original steel frames and doors which are rusted beyond repair, and need replaced.

Interior Doors/ Hardware:

Interior wood doors are original to the building and are worn due to their age. All of the door hardware throughout the building is knob-type, which is not ADA compliant. Lever type accessible hardware should be installed with classroom type lockers which permit teachers to lock their doors from within their rooms with a key.

Interior Spaces:

Corridors:

The corridors through the building, including both the original 1964 construction and the 1971 addition, consist of terrazzo floors, 4"x6" ceramic wall tile wainscot with painted plaster above, and 2'x4' acoustic tile ceilings. The terrazzo floors need filled at various cracks/pitted locations followed by grinding and polish to restore their original look. The ceramic wall tile is in fair condition, with minor chips and cracks throughout. The ceiling tile is also in fair condition.

Corridor lockers are also original to the building and should be electrostatically painted and hardware replaced to restore their finish and functioning ability. The building's stair wells contain guardrails and handrails that do not currently meet code. The stair guard rails do not include elements to protect users from climbing and/or falling through their 'open' arrangement. The handrails also do not meet accessibility standards in regards to their mounding height and grip arrangement.

Interior Spaces (continued):

Classrooms / Instructional Spaces: The classrooms finishes are in fair condition and contain vinyl floor tile, painted plaster walls, and 2'x4' ceiling tile in the original 1964 portion of the building. A 1'x1' concealed grid ceiling tile exists in the 1971 addition. Original chalkboards are present in most of the rooms, while some have smart boards that were retrofitted over the chalkboards at a later date.

The storage cabinets within the rooms are also original, and their wood finish and hardware are worn due to use and life. The metal wall shelving on the exterior wall of the classrooms is original to the building and addition, and is connected to the unit ventilators (UVs). This shelving would likely need modified and/or replaced if the UV are replaced in the future.

Library: The Library space was constructed within the 1971 addition. All the furnishing (tables, chairs, shelving, etc.) are original to this period, and are worn due to their use and life. The vinyl tile floor, painted plaster walls, and 2'x4' acoustic tile ceiling are in fair condition.

Multi-Purpose Room(s): The lower, 1971 addition's multi-purpose room is utilized as the cafeteria and gymnasium. The vinyl tile floor painted concrete masonry walls and exposed structural acoustic roof deck are all in good condition. Additional wall padding is recommended to protect students from injury during gym events. Basketball backstops are in fair condition.

The original 1964 upper multi-purpose room (former kitchen/cafeteria) has a vinyl tile floor, glazed face block walls and a 2'x4' acoustic ceiling, which are all in fair to poor condition. This space is utilized as a secondary gymnasium. Similar to the lower gym, additional wall pads should be considered for added impact protection, especially at the protruding UVs in this space.

Kitchen: The kitchen's quarry tile floor, structural glazed face tile (SGFT) walls, and the 2'x4' acoustic ceiling tile are in fair condition. The school's kitchen is used as the bakery, serving all other District buildings with baked goods. In general, the majority of the kitchen equipment is original to the 1971 building addition, with limited pieces being replaced with either new or with used equipment from other buildings. Due to the age of the equipment, repairs are becoming increasingly difficult due to the availability of parts.

Current plans exist to replace the dishwasher with a pot sink, since the entire district has recently switched to disposable bio-degradable trays in lieu of reusable plastic trays for lunch distribution. The kitchen's serving lines are located in the building's corridor which causes congestion during lunch periods. A more efficient serving line layout is desired either adjacent to the cafeteria or within the kitchen.

Interior Spaces (continued):

Office: The finishes within the office area consist of carpet floors, painted plaster walls, and 2'x4' acoustic tile ceilings which are all in fair condition. The nurse's suite contains vinyl floor tile which is also in fair condition. The original wood cabinets and casework are worn due to their age and need replaced. Although the school office suite is located adjacent to the main school entrance, it could be better organized to permit visitors to enter the office via a secure vestibule.

Restrooms / Locker Rooms: The restroom and locker room finishes are ceramic mosaic floor tile (CMT), 4"x6" ceramic wall tile, and painted plaster ceilings which are all in good to fair condition. The painted metal toilet partitions are also original and are rusting through at their bases and side panels. Their current arrangement and the toilet/sink heights do not provide the proper clearances to meet ADA requirements. Kindergarten classrooms do not have a single-user toilet within their rooms.

HVAC:

Existing Systems: Two (2) boiler rooms exist in the building; one is in the original 1964 building and one in the 1971 addition. The boilers are gas-fired, Bryan water-tube type. Given their age, the boilers should be replaced. Each boiler room consists of two (2) based-mounted pumps serving the heating water systems. Pumps are constant volume and are original to the portions of the building that they serve. Due to their age and serviceability the pumps should be replaced.

Considerations should be given to consolidating systems to avoid duplication of replaced equipment. Further analysis of the building's piping system is necessary to determine if this is feasible.

The hot water piping systems are original to the building / addition. Given their age, they should be replaced, but X-ray testing is recommended to determine if reuse is possible.

Only the office area is air-conditioned. All of the other areas are heating/ventilating units only.

Miscellaneous terminal heating equipment (unit heater, cabinet heaters, fin-tube radiation) serve unoccupied spaces and are generally in fair condition.

The control system is a pneumatic type which appears to have been capable of minimal energy management, such as day/night operation. The economic life span of a pneumatic control system is generally considered to be 20-25 years. An upgrade to a direct digital (DDC) system would take advantage of the superior energy management technologies available.

The perimeter classroom areas of the building are served by traditional classroom unit ventilators. Units appear to be original and should be replaced due to the decreasing availability of repair parts.

HVAC:

Existing Systems (continued): The perimeter classroom areas of the building are served by traditional classroom unit ventilators. Units appear to be original and should be replaced due to the decreasing availability of repair parts.

Specific Areas and /or Systems:

Cafeteria/Gymnasium: A central station air handling unit serves this space, and is located in the upper level mechanical room. The unit is original to the 1971 addition, but is operating satisfactorily.

Locker Rooms: These spaces are exhausted only with terminal heating devices.

Library: This area is served by heating-only, floor-mounted unit ventilators. Units appear to be replaced.

Offices: This area was original served by through-the-wall PTAC (air-conditioning) units. The louvers for the PTAC units are boarded up and the units are non-functional. Window units have been added.

Plumbing:

Central Services: The domestic water is supplied via a municipal system. No reports of water pressure problems were given. The sanitary sewer system is connected to the municipal system. This building is the only one supplied by Peoples Gas.

Piping: The domestic water piping is original from 1964 and is showing signs of aging. Due to its age, it is recommended that test/x-ray samples of miscellaneous sizes of pipe throughout the building be taken to determine the condition so that reuse potential can be confirmed. The sanitary sewage system was reported to be working adequately.

Fixtures: The majority of the plumbing fixtures are in good to fair condition. The existing flush valves and faucets are manual; it is requested that any new flush valves and faucets be automatic type. New fixtures are required to meet ADA requirements. If new are installed, low flow type should be utilized.

Equipment: The domestic water heater is a gas-fired Raypack unit installed in 1987 and located in the 1964 boiler room. The hot water storage tank is original and oversized and should be replaced. There is an existing thermostatic mixing valve for the hot water system on the outlet side of the hot water storage tank. Due to its age and condition, a new domestic hot water system is recommended to be installed with thermostatic control valves to provide proper water temperature distribution throughout the facility.

Electrical:

Service: The Power Company serving the School is Duquesne Light Company. The service consists of a 300KVA pad mounted transformer with underground service feeders to a building. The existing service is 208Y/120 volt, 800 amp, 3 phase 4 wire. The power company records indicate a peak electrical demand of 165 KW in November of 2012, which would represent 458 amps.

Power: The existing main distribution panel board was manufactured by General Electric. It is a Spectrum Series panel board. The main distribution switchboard has an 800 ampere main breaker. The condition of the switchgear appears to be very good. Most of the downstream distribution is original to the building.

Emergency Generator: The existing 7.5 kW, natural gas emergency generator is by Kohler, and is in poor condition and needs replaced. The generator feeds life safety loads and miscellaneous mechanical circuits. The elevator is not on emergency power.

Lighting: The interior lighting fixture lamps and ballasts were converted to energy-saving T-8 lamps with electronic ballasts. The existing lighting consists of prismatic lensed fixtures and generally is in fair to good condition. A few fixtures will require replacement of damaged lenses.

The existing exterior lights are in good condition with many of the pole mounted fixtures being installed in 2002. LED fixtures could be considered for reduced energy and maintenance. New LED lights are planned for replacement in the upper Multi-Purpose room. The exit signs are incandescent and should be replaced with LED type. Motion sensors are installed only in the administration area and should be installed in the classrooms for lighting control.

PA / AV / Technology Systems: The PA system consists of a Bogen head end unit with speakers in the classrooms and corridors. The system is in good operating condition. Many classrooms have smart boards and projectors installed, however, approximately twelve (12) classrooms are still in need of smart boards and projectors. Through recent advancements in technology, upgrades to these systems may be considered by the School District.

Data/ Telephone: The data cabling infrastructure throughout the building was upgrades and replaced with Category 5E cable during a project in 2001. The cabling network has sufficient capacity to handle the data system requirements. Wireless access has been installed throughout the school. The telephone system consists of an Alcatel Lucent IP touch system. Advancements in technology within the last 5 to 10 years has vastly improved the function and capabilities of these systems; replacement of these existing systems would improve the School District's operation.

Electrical (continued):

Fire Alarm/ Security: Currently there are 4 different fire alarm systems throughout the building. Due to these modifications through the years to the original Simplex/Edwards fire alarm system, it should be entirely replaced with one system that meets today's code requirements. Several security cameras are located on the exterior and interior of the building. A key fob/intercom access control (Aiphone) at the main entrance and rear entrance. The security is IP based and controllable over the network/internet.

Building Security: As described above, a new secure vestibule should be implemented adjacent to the Main Office suite to direct visitors to check-in before accessing to the remainder of the school. Currently only a camera/intercom with a remote door release (monitored at the Office) controls visitors entering the building. Select other exterior doors have card access control installed to permit staff entry at these locations. Consideration should be given to expand this system to all exterior doors. Security cameras also exist within the building's corridors and select exterior locations.

ADA Compliance: The building's Elevator was installed in the 1971 addition and does not meet ADA guidelines. The hallway and cab's control panel height, fireman's recall, fire alarm integration, and emergency power improvements all need addressed on the Elevator. Building gang and single-user restrooms are limited in size and their fixtures and grab bars do not satisfy height and clearance requirements. Several classroom door entrances also do not provide adequate clearance to properly approach and use the door, according to code. Tactile signage at all interior room entrances is also required.

State Code Compliance: The building meets the applicable requirements of the state building code when it was constructed, therefore it is 'grandfathered' or certified for use in its current condition. If renovations occur at this facility, then the alterations and/or additions (including an unobstructed path to the renovated areas), needs to meet all requirements of today's code.

Asbestos: 9"x9" and 12"x12" vinyl asbestos tile still exists in many of the classrooms on the ground and first floors. Asbestos containing fiberglass pipe elbows and insulation also exist above ceilings in the basement and corridors. The boilers' tube material may also be asbestos containing and should be tested prior to a renovation project.

Overall Building Condition: Fair.

EXISTING

approx. 10.75 Acres

0 50' 100' 200'

SCALE: 1" = 100'-0"

N

SITE PLAN

Address: 700 Scott Avenue
Glenshaw, PA 15116

Constructed: 1957, 1959 (as Junior High School)
Classroom Addition: 1964
Clsrm./Natatorium Addition: 1968
Alterations: 1987
Classroom Addition: 1990
Select Classroom Alterations: 1991
Select Restroom Alterations: 2003
Elementary School Alterations: 2008

Enrollment: 1,018 Students (4-6), 114 Staff

Size: 184,205 square feet on approximately 22 acres

Site: The school is situated in a residential neighborhood in Shaler Township across from Rogers Primary School. The site is relatively flat and shared with three (3) softball/little league baseball fields, basketball/tennis courts, a fenced playground, a 6-lane track with track and field events, and a football field with a concession stand.

The asphalt drives and parking lots are in fair condition, with the front drive and lots showing signs of surface cracks and in need of resurfacing within the next few years. The rear drives and lots were replaced in 1999 and 2008 and are in good condition. The concrete curbs and walks at the front of the building are in fair to poor conditions and showing signs of cracks and spalling, while the newer curbs and walks at the rear are in good condition.

Structure: In general, the original building and the majority of the additions thereafter, are constructed of steel roof joist resting on steel beams supported by steel columns. These columns bear on concrete pier foundations. Other non-load bearing walls bear on concrete spread footings.

The exterior steel canopy columns located at the 1990 classroom addition on the west side of the building are rusting at their bases near the concrete walk. These column bases should be cleaned of the rust and repainted or covered entirely with concrete or steel plates to restore their structural integrity. Many areas on the exterior walls including the two (2) chimneys are showing signs of brick deterioration due to water infiltration and require repointing and/or replacement. The lintels at the upper glass block windows at the upper gym level are also rusting and causing the brick at the head of the window openings to deteriorate due to the expanding steel.

Roof: The Celotex adhered rubber roof membrane was installed in 1996 and is in fair condition. The membrane and perimeter fascia is in good condition, but the seams, wall terminations, and equipment curbs appear to have failed due to the amount of repair patches present. The warranty has expired. The 1991 addition has its original Firestone stone ballasted rubber roof which is in poor condition and reportedly leaks at the transition between the canopy's pitched metal roof and the flat roof.

Windows: The exterior windows (replaced in 1987) currently leak air and water and contain phenolic insulation in their solid metal panels. This insulation has caused premature rust failure on the metal cladding on the panels. These windows are in poor condition and need replaced. The high windows located above the ceilings in the chorus and band rooms are original, steel windows and are inaccessible from the interior of the building. These windows are also no longer operable. They are permanently in the 'open' position and allow air, water, and insects to enter the building. These windows are in extremely poor condition, and should be replaced or removed in their entirety.

Exterior Doors / Frames: The exterior doors and frames are original to each building's addition. The main lobby and corridor entrances are aluminum which leaks air and the secondary service doors are steel which are rusting due to their age. All of the exterior doors should be replaced due to their poor condition.

Interior Doors/ Frames: Similar to the exterior doors, the interior doors and windows are original to each renovation that occurred during the life of the building. As a result, the doors and hardware vary in condition. The original building's wood doors are in poor condition due to their age and wear, while the new doors and hardware from the 2008 renovation are in excellent condition. In general, all doors that contain knob-type hardware should be replaced with ADA lever–style hardware and classrooms should have secure locksets which permit keyed locking from both sides of the door.

Interior Spaces:

Corridors: In general, all corridor finishes (terrazzo floors, SGFT walls, and acoustic ceilings) were either replaced or restored during the 2008 renovation project. Corridor lockers are also new and in good condition.

Classrooms / Instructional Spaces: Some of the classrooms were renovated during the 2008 renovation and contain new casework, floors, painted walls, and new acoustic ceilings which are all in excellent condition. Other classrooms have not received improvements since earlier renovations which now are in need of updating. Exterior metal shelving is attached to the room's unit ventilator and will need replaced if the unit ventilator is replaced in the future. The 9"x9" vinyl floor tile and acoustic ceilings are in poor condition due to their age. Classroom chalkboards have been recently overlaid with a markerboard surface.

Library: The library's carpet and painted walls have recently been replaced, and are in good condition. The acoustic celling is 2'x4', and in fair condition. Library shelving and the circulation desk has also been upgraded to accommodate elementary-aged students, and is in good condition.

Gymnasium: All finishes and equipment were replaced and/or restored in 2008 and are in excellent condition.

Interior Spaces (continued):

Auditorium: The auditorium and stage's finishes and equipment (including stage rigging and 970 auditorium seats) were replaced and/or restored in 2003 and are in good condition. Stage curtains are in good condition.

Natatorium: The pool and pool equipment, spectator area, and locker rooms were renovated in 2002 and are in good condition.

Cafeteria: The cafeteria's finishes are in excellent condition due to their recent renovation in 2008.

Kitchen: All kitchen finishes and equipment were replaced in 2008 and are in excellent condition.

Office: The office's equipment and finishes were recently updated and are in excellent condition.

Restrooms: Three sets of student gang restrooms were updated in 2003. New toilet partitions, fixtures, and accessories were provided, but only one (1) of the three (3) sets were handicap accessible. The four (4) other remaining restrooms, gym locker rooms, and basement football locker rooms are original to their period of construction and are in fair to poor condition. Clearances and fixture heights must be modified to meet ADA requirements. Tile floors, SGFT walls, and acoustic ceilings are in fair condition.

HVAC:

Existing Systems: The HVAC system is a two-pipe type hot water distribution system. Approximately half of the building is air conditioned via roof top units installed in 2008.

Two boiler rooms exist, one each near the auditorium and near the pool. The room near the auditorium consists of two (2) gas-fired, high efficiency Patterson Kelly boilers. They are 10 years old and in fair condition. The boiler stack is in poor condition and needs to be repaired and/or replaced. Two (2) base mounted pumps serve the hot water system, are constant volume and are in fair condition. Importantly, boilers of this type have a relatively short lifespan (15 years).

The boiler room near the pool contains two (2) gas-fired Bryan water-tube type boilers. Three (3) base mounted pumps serve the hot water system, are constant volume and are in poor condition.

The original hot water piping systems exist, and should have remaining usable life expectancy. They should be X-ray tested to confirm condition.

HVAC:

Existing Systems (continued):

Approximately half the building is air conditioned, including a few classrooms, Library, Kitchen, Cafeteria, MDF/IDF room; all other areas are heating / ventilating units only.

Miscellaneous terminal heating equipment such as unit heaters, cabinet heaters and fin-tube radiation serve unoccupied spaces and are generally in fair condition.

The control system is a pneumatic type which appears to have been capable of minimal energy management such as day/night operation. The economic life span of a pneumatic control system is generally considered to be 20 to 25 years. An upgrade to a direct digital (DDC) system should be done to take advantage of the superior energy management technologies available through such systems.

The perimeter classroom areas of the building are served by traditional classroom unit ventilators that are blow-thru type. Units appear and were reported to be in good condition and should be able to remain in a renovation project. A recommissioning effort should be conducted to confirm proper operation and to generate a list of deficiencies and scope of repairs.

Specific Areas and/or Systems:

Gymnasium: Two (2) heating-only central station air handling units serve this space. The units are located in upper level mechanical rooms, and are loud. The barometric relief dampers are inoperable. VFD should be installed on the fans to improve sound conditions.

Auditorium: This area was renovated 9 years ago. A new AAON roof top unit was installed, and the original unit left in place. The space has noise issues that need to be addressed.

Locker Rooms: These spaces are exhausted only with terminal heating devices.

Library: This area is served by an air handling unit and the original unit ventilators. The air handling unit has not been operational and needs to be replaced with one equipped for air conditioning.

Office: This area is served by through-the-wall PTAC units. These units are in poor condition and should be replaced.

Pool: This area is served by a PoolPAK unit. The unit was recently rebuilt and controls upgraded.

Plumbing:

Central Services: The Domestic Water is supplied via the Municipal system. No reports of water pressure problems were reported. The Sanitary Sewer System is connected to the municipal system. The gas service is supplied by Equitable Gas.

Piping: The domestic water piping is original from 1957 and is showing signs of deterioration. Due to its age, it is recommended that it be replaced. The main water service has a back flow preventer installed. The Sanitary Sewage System was reported to be working adequately.

Fixtures: The majority of the plumbing fixtures are in good to fair condition. The existing flush valves and faucets are manual and it was requested for the new flush valves and faucets to be automatic type. New fixtures are needed to meet ADA requirements. Where new are installed, low flow type shall be utilized.

Equipment: The domestic water heater is an Ajax gas-fired and was replaced approximately 3 to 4 years ago and is located in the Boiler Room. The hot water storage tank is original and oversized and should be replaced. There is an existing thermostatic mixing valve on the outlet side of the hot water storage tank.

Kitchen: This area was renovated in 2008 and has elements that have not yet been completed. There are approx. 7 floor drains missing and equipment connections plugged.

Pool Equipment: The pool heater is a A.O. Smith Duromax Heater. The heater was installed in 2004 and is in good condition. The pool piping and filters were upgraded in 2000. The piping is a mixture of schedule 40 and 80 PVC.

Electrical:

Service: The Power Company serving the School is Duquesne Light Company. The service consists of al 750 KVA pad mounted transformer with underground service feeders to a building. The existing service is 208Y/120 volt, 4000 amp, 3 phase 4 wire. The power company records indicate a peak electrical demand of 635 KW in June of 2013, which would represent 1764 amps.

Power: The existing main distribution panel board was manufactured by Seimens. The main distribution is a 4000 amp switchboard that back feeds the original service. The original switchgear needs to be upgraded. Many new branch panel boards have been installed. Where new panelboards are installed, most have many space circuit breakers.

Electrical (continued):

Emergency Generator: There are currently two generators serving this building. The first is a 15 kW, natural gas emergency generator manufactured by Kohler (2011) and the second is 40 kW natural gas generator (1996). Both generators are newer and appear to be in good condition. The generators feed life safety loads and miscellaneous mechanical circuits.

Lighting: The interior lighting fixture lamps and ballasts were converted to energy-saving T-8 lamps with electronic ballasts. The existing lighting consists mostly of prismatic lensed fixtures as well as parabolic fixtures. The cafeteria was recently renovated when linear pendant and volumetric style fixtures are installed. Generally the lighting throughout the building is in fair to good condition. A few fixtures will require replacement of damaged lenses. The existing exterior lights are in fair condition. Some of the existing downlights in the canopies are damaged or mismatched and should be replaced. LED fixtures could be considered for reduction energy and maintenance.

PA/AV/ Technology Systems: The PA system consists of a head end unit with speakers in the classrooms and speakers in the corridors. The system is original to the building and should be replaced. An AV distribution system is installed in the classrooms that include smartboards, ceiling mounted televisions and projectors; these systems appear to be functional. Though recent advancements in technology, upgrades to these systems may be considered by the School District.

Data/ Telephone: The data cabling infrastructure throughout the building was upgraded and replaced with Category 5E cable during a project in 2001. The cabling network has sufficient capacity to handle the data system requirements. Wireless access has been installed throughout the school. The telephone system consists of an Alcatel Lucent IP touch system. Advancements in technology within the last five to ten years have vastly improved the function and capabilities of these systems and replacement of these existing systems would improve the School's operation.

Fire Alarm/ Security: The existing Siemens fire alarm system was upgraded in 2007-08, however there still may need to be some upgrades to meet current ADA standards. There is several security cameras located on the exterior and interior of the building. There is key fob/intercom access control (Aiphone) at the main entrance and the rear entrance. The security is IP based and controllable over the network/internet.

Building Security: A new security vestibule was recently installed adjacent to the office suite to allow visitors to communicate with (via an intercom/camera) and enter the office prior to entering the building. A card access system is installed on all exterior doors and cameras are positioned at the exterior and throughout the building's interior.

ADA Compliance: As mentioned above, several student gang restrooms and single use toilet rooms do not meet ADA requirements. Door entrances to classrooms also lack sufficient clearance to approach the door and open it by a disabled person.

State Code Compliance: The building met all codes in effect when the facility was constructed, renovated, and added on to in the past, and is therefore certified to exist in its current state (excluding federal accessibility guidelines, which still need corrected). Similar to the 2008 alterations, if more improvements were to occur today in the building, the altered areas and systems as well as the path to altered areas must be brought up to today's current building code.

Asbestos: The 9"x9" vinyl asbestos floor tile, ductwork vibration dampers, fiberglass insulation pipe elbows, and select ceiling plaster represent remaining asbestos containing materials in this building. These would need abated prior to work occurring near these areas.

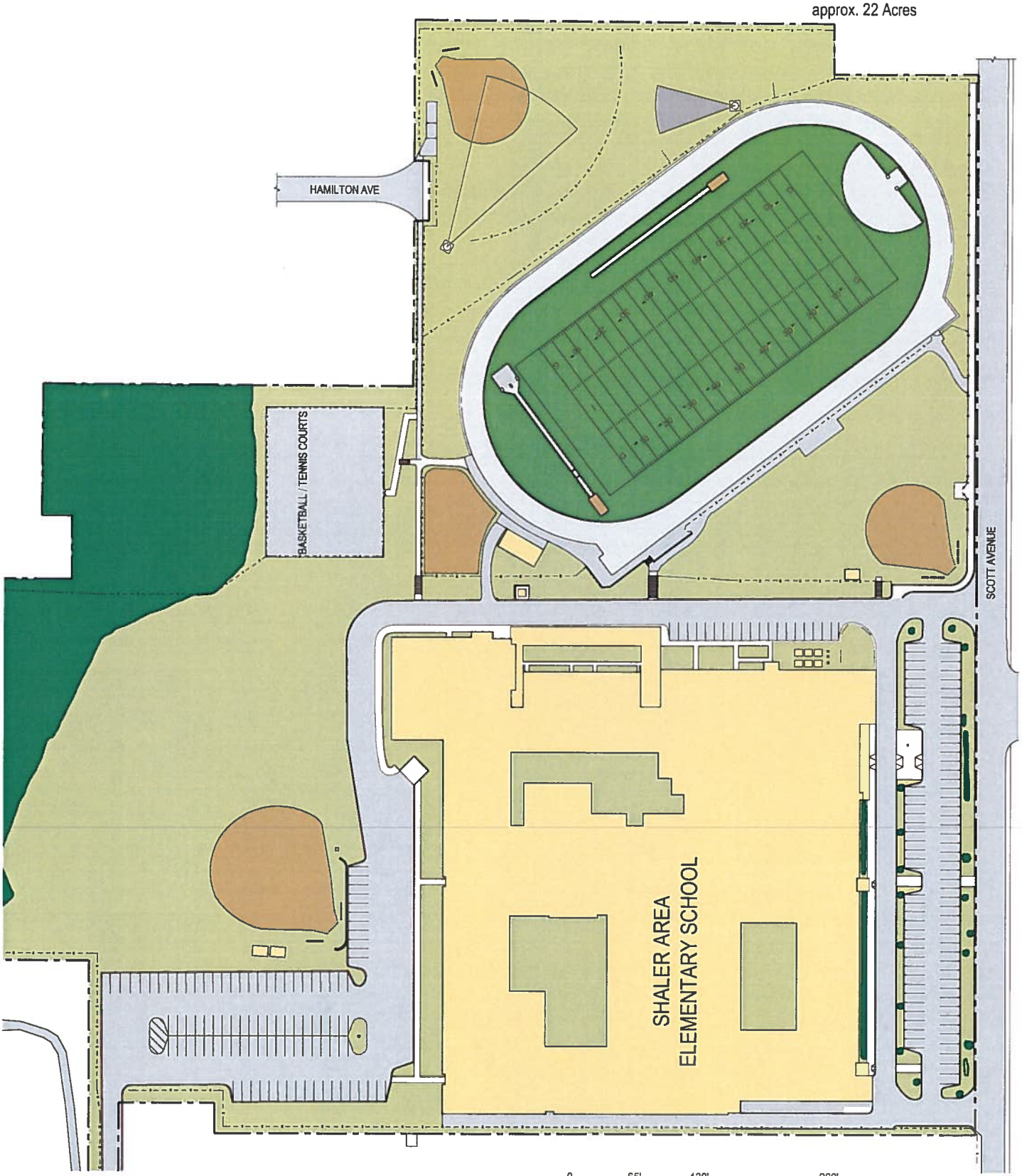
Overall Building Condition:

Interior: Fair to good.
Exterior: Fair to poor.

SHALER AREA ELEMENTARY SCHOOL

EXISTING

approx. 22 Acres



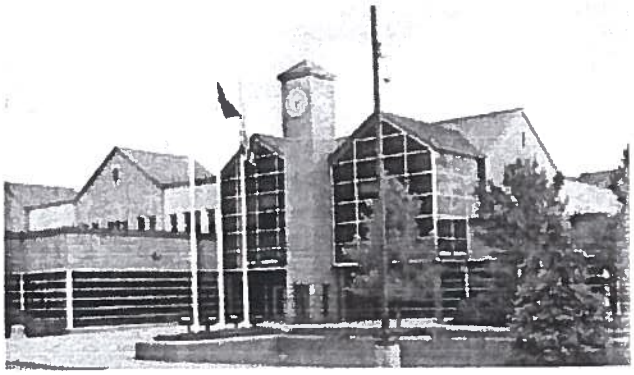
SITE PLAN

SCALE: 1" = 130'-0"

Address: 1810 Mount Royal Boulevard, Glenshaw, PA 15116

Constructed: 1998 (major reconstruction), 2008 renovated

Enrollment: 722 Students (7-8), 161 Staff



Size: 205,211 square feet on approximately 23 acres

Site: The school is situated in a residential neighborhood in Shaler Township, and shares its campus with the stadium and track and field events.

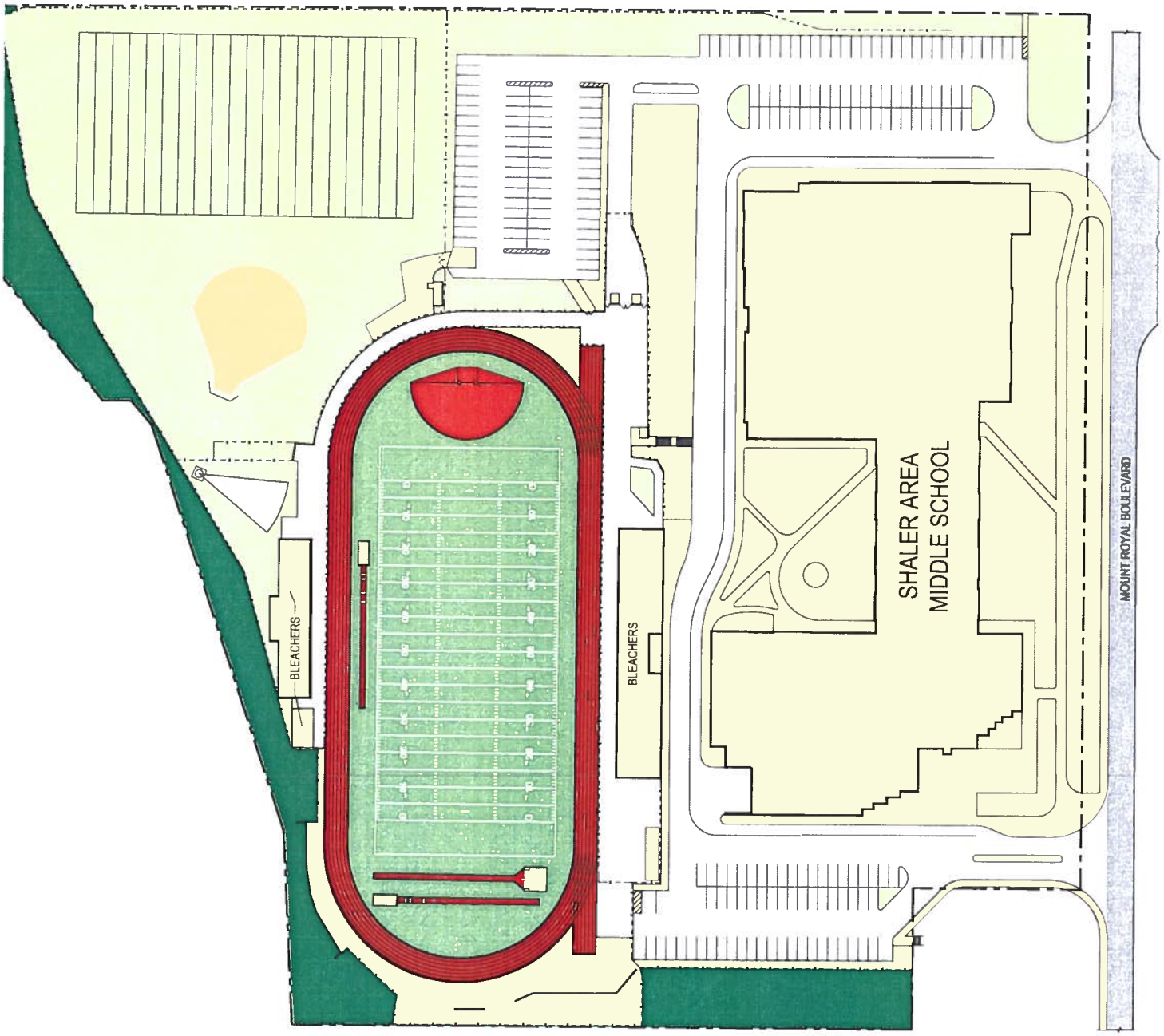
The District Offices are located in the south end of the school.

Structure: In general, the school is very well maintained and is in good condition.

Entry Vestibule: The existing visitor entry from the visitor parking lot is not secured. Visitors to the school have unrestricted access to the building once they enter the lobby doors.

EXISTING

approx. 17.426 Acres



0 65' 130' 260'

SCALE: 1" = 130'-0"

SITE PLAN

Address: 1660 Butler Plank Road,
Glenshaw, PA 15116

Constructed: 1970's
Office Addition: 1996, Office Vestibule Addition and Alterations: 2006, (due to storm damage and flooding)

Size: 5,720 square feet on approx. 1 acre

Site: The maintenance facility is located in the Business District of the Glenshaw Community in Shaler Township. Situated adjacent to railroad tracks and Route 8 to the East, and Pine Creek to the South, it lies within the flood plan. This location resulted in flood damage to the facility from Hurricane Ivan in 2004. Downstream improvements to Pine Creek have been made, but a similar severe storm event has not yet occurred to determine if the facility would be affected by flood. Vehicles access the facility to the West directly onto Butler Plank Road.

The parking and storage areas are comprised of gravel paved areas, which are in good condition. The concrete pads at the pedestrian and vehicle entrances are in good condition. The chain link fence with privacy slats surrounding the perimeter of the property are also in good condition. Parking and general outside storage of vehicles and maintenance is limited due to the constraints of the property.

Structure: The original garage portion of the structure is a steel framed structure with metal trusses. The perimeter metal framed walls rest on a masonry lower wall which sit on concrete spread footings. The roof structure's height was increased on the garage door bay side of the building by overbuilding wood framing on the existing structure to accommodate its use as a bus garage at an earlier date. The concrete floors are in good condition. The office addition is a wood framed structure with roof trusses that also rest on concrete spread footings.

The entire building structure is in good condition.

Roof: The metal roof (and walls) and perimeter fascia, gutters, and downspouts of the garage are well insulated and in good condition. The asphalt shingles and aluminum gutters and fascia on the office addition are also in good condition.

Exterior Doors / Windows: The five (5) overhead doors (not replaced in 2006) are in fair condition, and the exterior FRP main doors are in good condition. The exterior aluminum windows in the office area are original to the 1996 addition and in fair condition.

Building Interior:

All interior wood and metal doors and frames, as well as interior finishes (walls, floors, and ceilings) in the office area are in good condition. The garage space is very tight for use as tool/maintenance storage and vehicle storage. The loft above a portion of the office area is also cramped with general file storage.

HVAC:

The offices are served by two (2) Lennox Gas/DX air handling units located in the loft. One 2 ton unit and a 5 ton unit are supplemented with two (2) energy recovery units tempering the outside air to the units.

The garage area is served by two (2) gas-fired prop heaters vented through the roof.

Plumbing:

The domestic water heater is an 80-gallon, 125 mbh, A.O. Smith Cyclone that was installed in 2006.

A back flow preventer is installed on the existing water service entrance.

The garage area has a speed-air duplex air compressor for the tools, routed throughout the shop area.

Electrical:

Service:

The Power Company serving the School is Duquesne Light Company. The service consists of a single pole mounted transformer with overhead service feeders to a building mounted weather head. The existing service is 208Y/120 volt, 225 amp, 3 phase, 4 wire. The company records indicate a peak electrical demand of 18 KW in December of 2012, which would represent 50 amps.

Power:

The existing main distribution panel board was manufactured by General Electric. The main distribution panelboard has a 225 ampere main breaker. The condition of the panelboard appears to be very good.

Emergency Generator:

The existing 10 kW, natural gas emergency generator and transfer switch is manufactured by Dayton and appears to be in good condition. The generator feeds miscellaneous circuits including the data rack and garage doors. Life safety lighting is handled by battery wall packs.

Lighting:

The interior lighting fixture lamps and ballasts were converted to energy-saving T-8 lamps with electronic ballasts. The existing lighting consists mostly of prismatic lensed fixtures as well as parabolic fixtures. Generally the lighting throughout the building is in fair to good condition. A few fixtures will require replacement of damaged lenses. The exit signs are incandescent and should be replaced with LED type. The existing exterior lights are in fair condition. The wall mounted fixtures are older and may need to be replaced. LED fixtures could be considered for reduced energy and maintenance.

Data/ Telephone: The data cabling infrastructure throughout the building was upgraded and replaced with Category 5E cable. The cabling network has sufficient capacity to handle the data system requirements. The telephone system consists of an Alcatel Lucent system.

Fire Alarm/ Security: The existing Simplex fire alarm system was upgraded with a new 4001 panel, however there still may need to be some upgrades to meet current ADA standards. There is several security cameras located on the exterior and light poles around the building. The security is IP-based and controllable over the network / internet.

Code Compliance: The facility complies with a version of the state's new building code due to the period when the most recent renovations occurred. Federal ADA guidelines were also accounted for during these renovations and appear to be in compliance.

Asbestos: None reported.

Overall Building Condition: Good.

BUILDINGS AND GROUNDS MAINTENANCE FACILITY

EXISTING

approx. 1 Acre

SITE PLAN

The following is baseline data.

SCHOOL/ ADDRESS/UTILITY SERVICE	NO. CUSTODIANS	HOURLY RATE	ANNUAL SALARY	TOTAL CUSTODIAL SALARIES	UTILITY COSTS	TOTAL OPERATIONAL COSTS	BLDG. AREA (sq. ft.)	OPERATIONAL COST/SQ. FT.
Reserve Primary	1	$21.90	$45,727.20					
2107 Londale Street	1	$15.00	$31,320.00					
Pittsburgh, PA 15212								
Totals	2			**$77,047.20**	**$27,200.00**	**$104,247.20**	**29,575**	**$3.52**
Jeffery Primary	2	$21.90	$91,454.40					
201 Wetzel Road								
Glenshaw, PA 15116								
Totals	**2**			**$91,454.40**	**$24,528.00**	**$115,982.40**	**30,440**	**$3.81**
Rogers Primary	2	$21.90	$91,454.40					
705 Scott Avenue								
Glenshaw, PA 15116								
Totals	**2**			**$91,454.40**	**$27,494.00**	**$118,948.40**	**34,940**	**$3.40**

SCHOOL/ ADDRESS/UTILITY SERVICE	NO. CUSTODIANS	HOURLY RATE	ANNUAL SALARY	TOTAL CUSTODIAL SALARIES	UTILITY COSTS	TOTAL OPERATIONAL COSTS	BLDG. AREA (sq. ft.)	OPERATIONAL COST/SQ. FT.
Marzolf Primary	2	$21.90	$91,454.40					
101 Marzolf Road Ext.	1	$18.59	$38,815.92					
Pittsburgh, PA 15209								
Totals	**3**			**$130,270.32**	**$40,314.00**	**$170,584.32**	**51,825**	**$3.29**
Burchfield Primary	1	$22.30	$46,562.40					
1500 Burchfield Road	2	$21.90	$91,454.40					
Allison Park, PA 15101	1	$18.59	$38,815.92					
Totals	4			**$176,832.72**	**$65,768.00**	**$242,600.72**	**56,350**	**$4.31**

Three Options

These three Options for the Primary Schools are presented on the following pages:

Option 1 - Renovate and Maintain all Primary Buildings

Option 2 - Close One Primary School - Reserve

Option 3 - Close Two Primary Schools - Reserve and Jeffery

Each Option is described in a graphic flowchart format, and contains a snapshot of facts associated with each School. Costs are also provided.

Additional Options

These Additional Options are also shown:

- Renovation of **Shaler Area Elementary School**.
- New **Two-Story Buildings and Grounds Maintenance / Locker Room Facility** at the Stadium.

  This additional option was developed to provide a more centralized location for Maintenance, but is predicated on the sale of the existing Butler Plank Road facility.

  The building would also contain space for a Locker Room for Shaler's teams, allowing the existing locker room to be used by the visiting teams, instead of their present use of the Middle School during games.
- Replacement of the **Synthetic Turf** and Resurfacing of the **Track and Field Events** at Shaler Middle School.
- Renovations to create a **Secure Visitor Entry Vestibule** at Shaler Area Middle School.

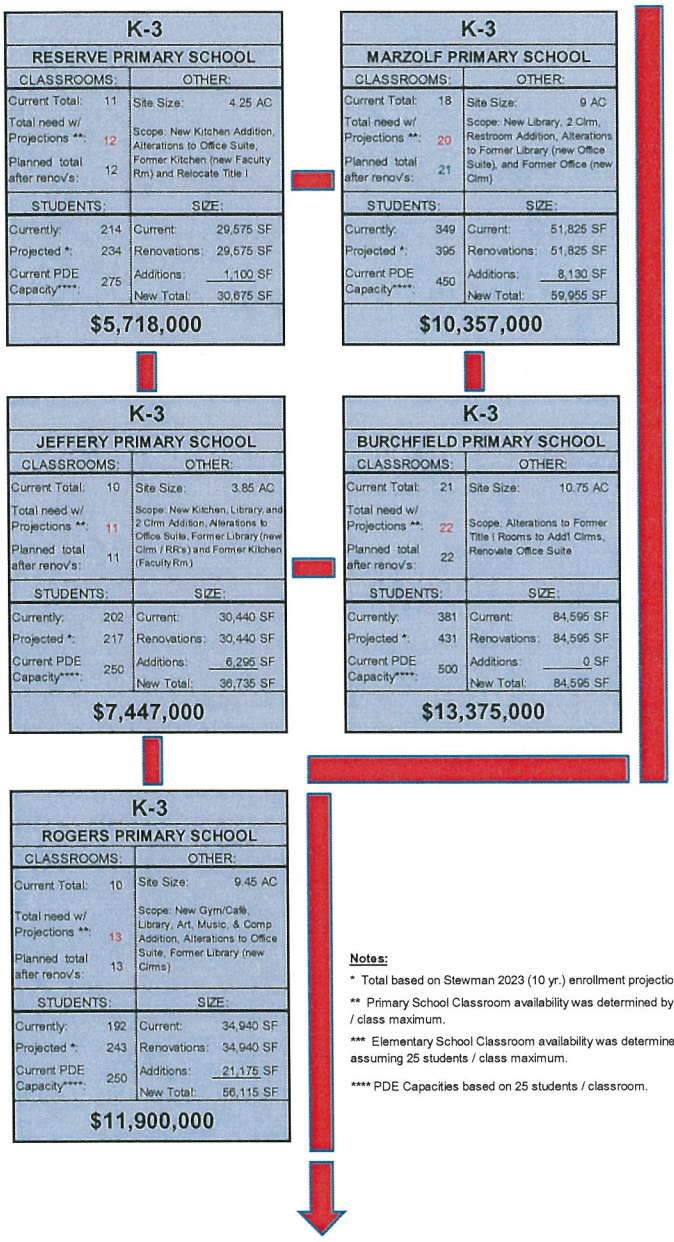
Time Line

Option 1 proposes a 10-year implementation horizon. Option 2 proposes 8 years, and Option 3 proposes 9 years. A detailed timeline to implement each Option is not included.

After review and discussion, the District will select its preferred Option, at which time a detailed time line and financing plan will be prepared to complete each individual project.

Option 1
Renovate and Maintain all Primary Buildings

PRIMARY / ELEMENTARY SCHOOL BUILDING CONFIGURATIONS



IMPLEMENTATION : 10 YEAR PLAN

BURCHFIELD: 2015-2017
ROGERS: 2017-2018
MARZOLF2018-2020
JEFFEREY: 2020-2021
RESERVE: 2021-2022
SHALER ELEM: 2023-2024

Primary Option 1 Total Project Costs:

$48,797,000

Additional Options:

New 18,000 sf Buildings & Grounds Maintenance Facility at MS, Includes Locker Rooms / Field Storage:	**$3,240,000**
Add Synthetic Turf / Track Resurfacing at MS Football Field:	**$1,400,000**
Add Securtiy Vestibule at MS	**$60,000**

Notes:

* Total based on Stewman 2023 (10 yr.) enrollment projections.

** Primary School Classroom availability was determined by 20 students / class maximum.

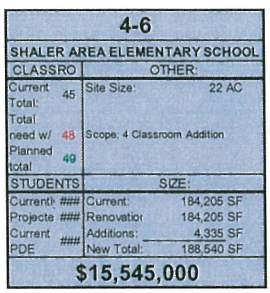
*** Elementary School Classroom availability was determined by assuming 25 students / class maximum.

**** PDE Capacities based on 25 students / classroom.

OPTION 1:

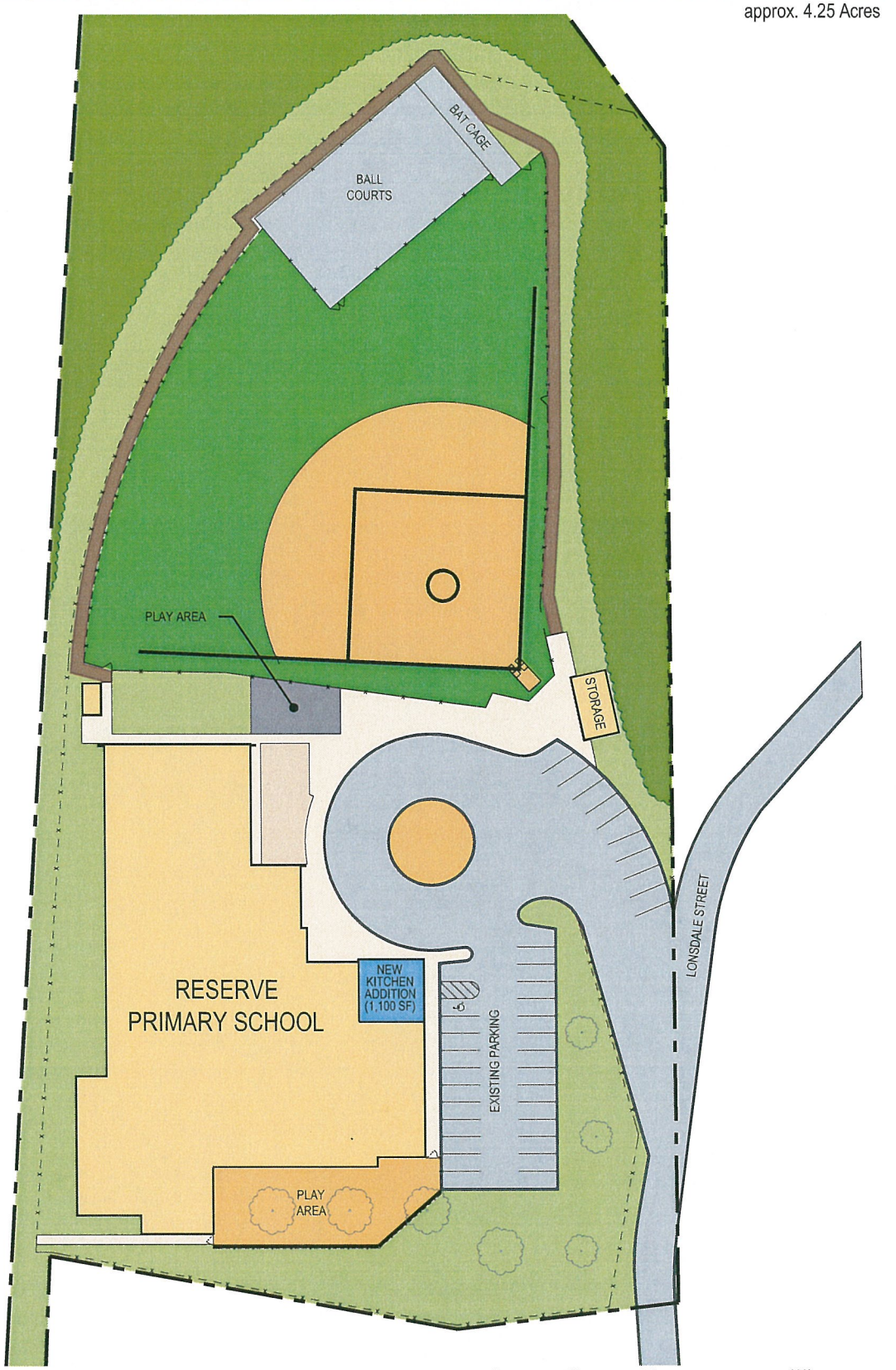
RENOVATE and MAINTAIN - ALL PRIMARY BUILDINGS

ADDITIONAL OPTION



Option 1

approx. 4.25 Acres

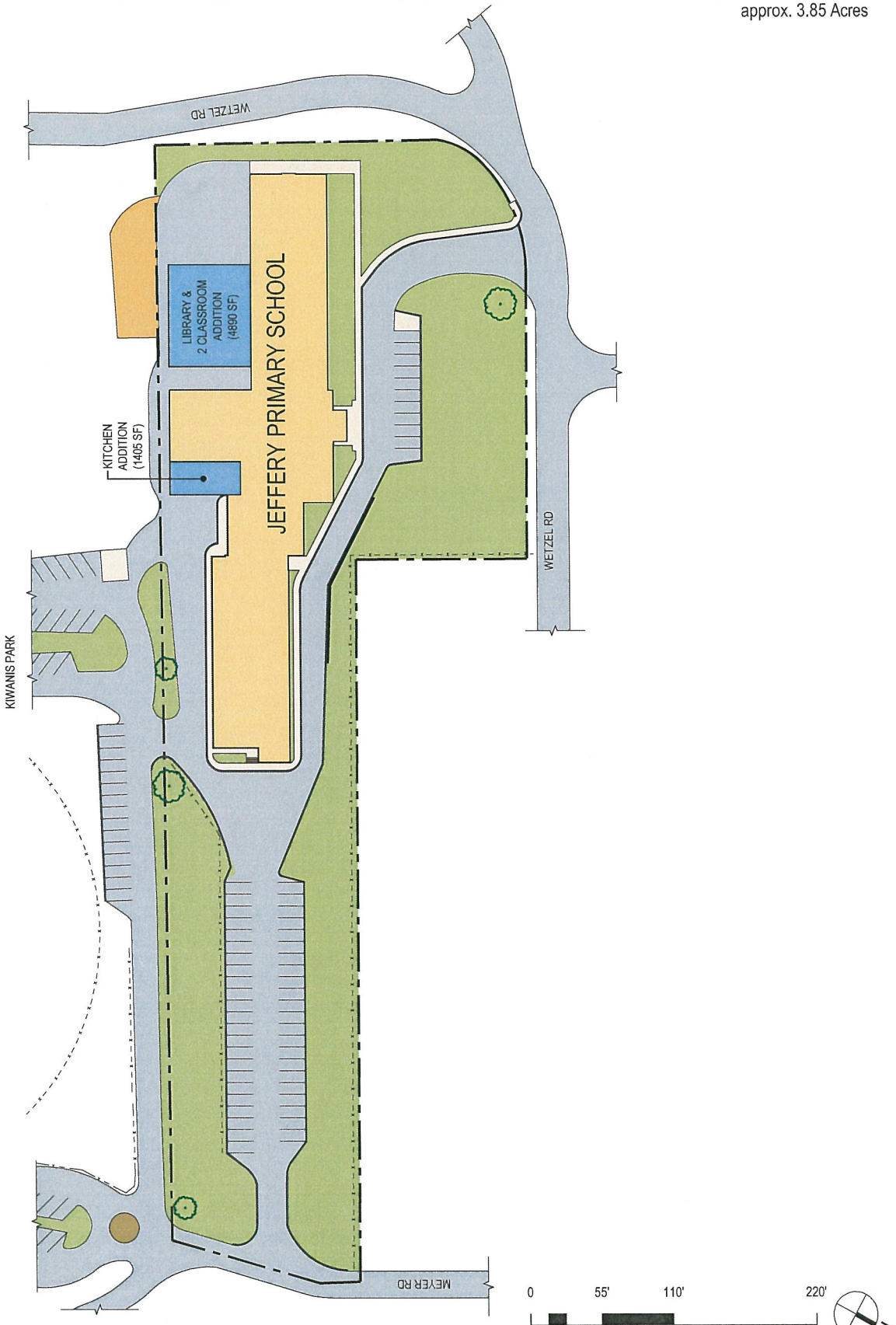


SCALE: 1" = 80'-0"

SITE PLAN

Option 1

approx. 3.85 Acres



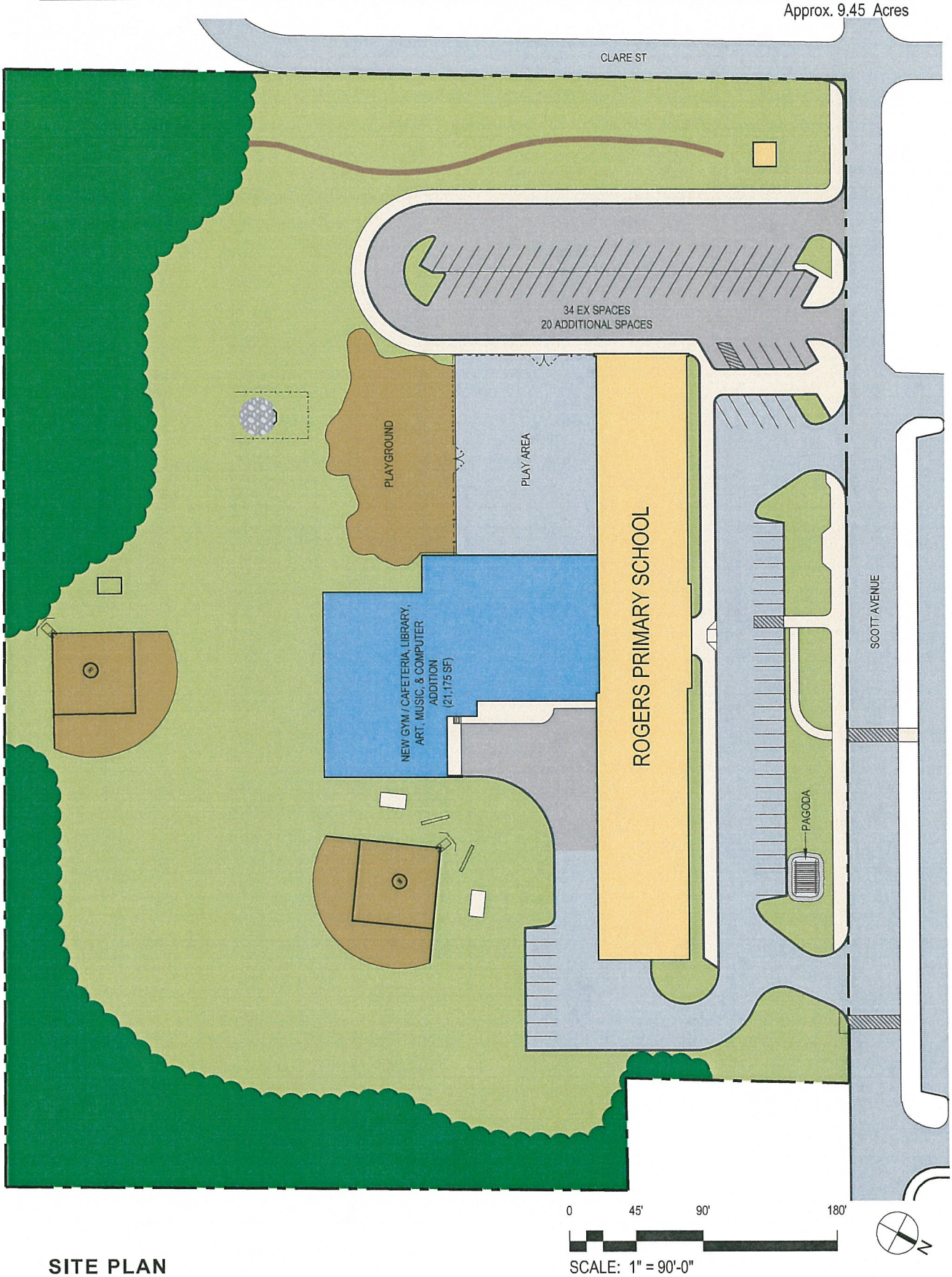
SCALE: 1" = 110'-0"

SITE PLAN

ROGERS PRIMARY SCHOOL

Option 1

Approx. 9.45 Acres



SCALE: 1" = 90'-0"

SITE PLAN

MARZOLF PRIMARY SCHOOL

Option 1

approx. 9 Acres

SITE PLAN

SCALE: 1" = 110'-0"

BURCHFIELD PRIMARY SCHOOL

Option 1

approx. 10.75 Acres

0 50' 100' 200'

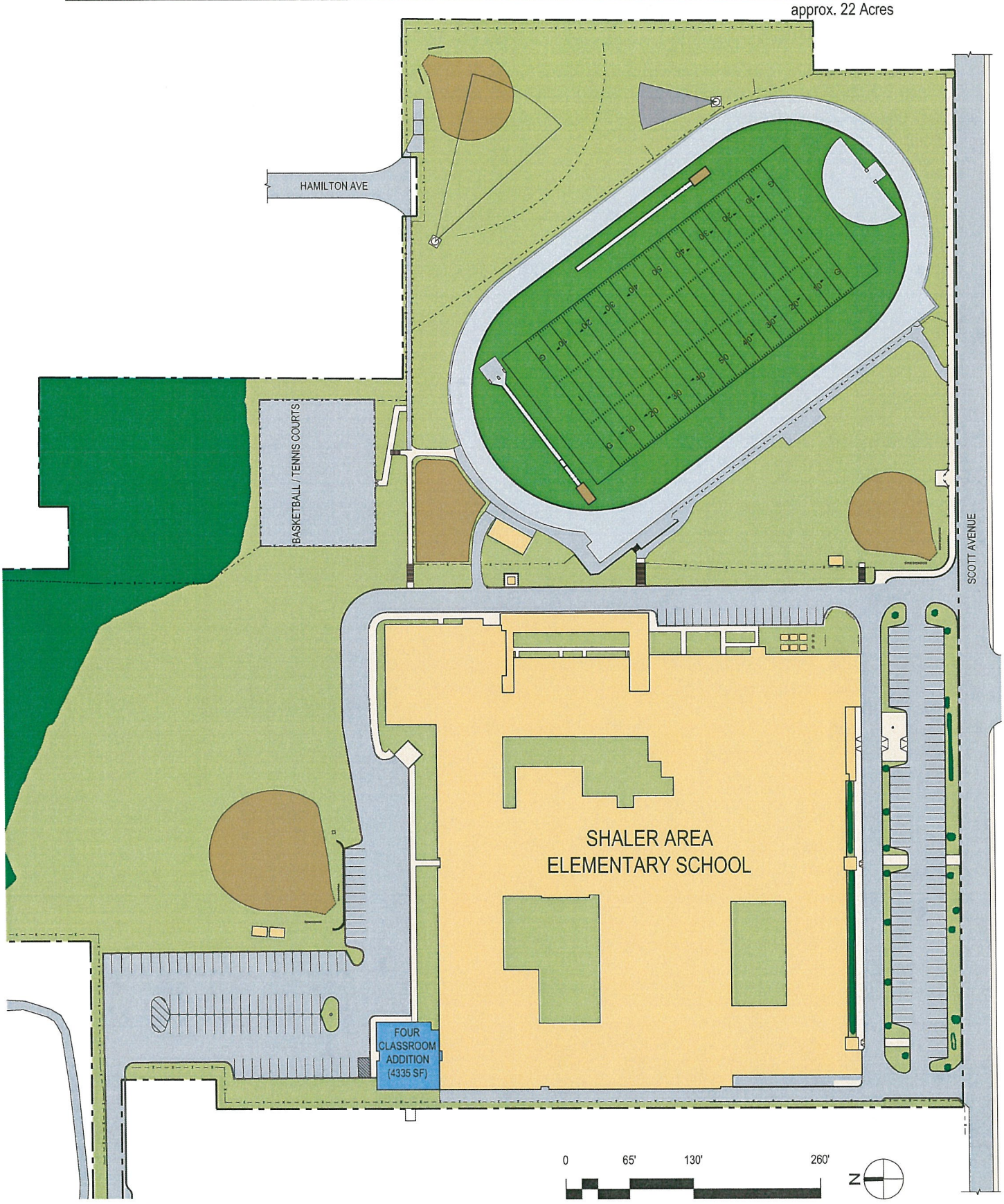
SCALE: 1" = 100'-0"

N

SITE PLAN

Option 1

approx. 22 Acres

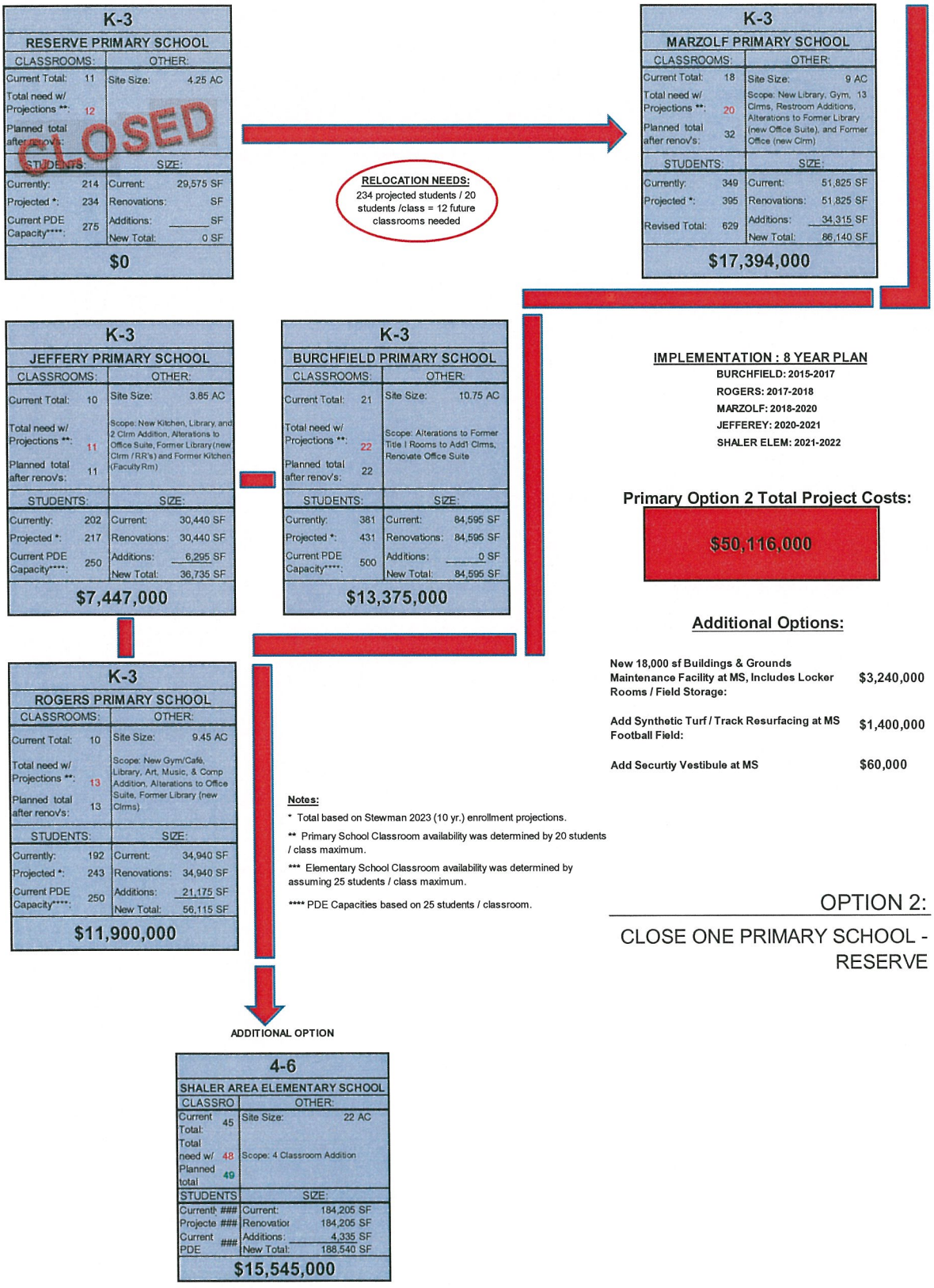


SITE PLAN

SCALE: 1" = 130'-0"

Option 2
Close One Primary School - Reserve

PRIMARY / ELEMENTARY SCHOOL BUILDING CONFIGURATIONS



IMPLEMENTATION : 8 YEAR PLAN

BURCHFIELD: 2015-2017
ROGERS: 2017-2018
MARZOLF: 2018-2020
JEFFEREY: 2020-2021
SHALER ELEM: 2021-2022

Primary Option 2 Total Project Costs:

$50,116,000

Additional Options:

New 18,000 sf Buildings & Grounds Maintenance Facility at MS, Includes Locker Rooms / Field Storage:	**$3,240,000**
Add Synthetic Turf / Track Resurfacing at MS Football Field:	**$1,400,000**
Add Securtiy Vestibule at MS	**$60,000**

Notes:

* Total based on Stewman 2023 (10 yr.) enrollment projections.

** Primary School Classroom availability was determined by 20 students / class maximum.

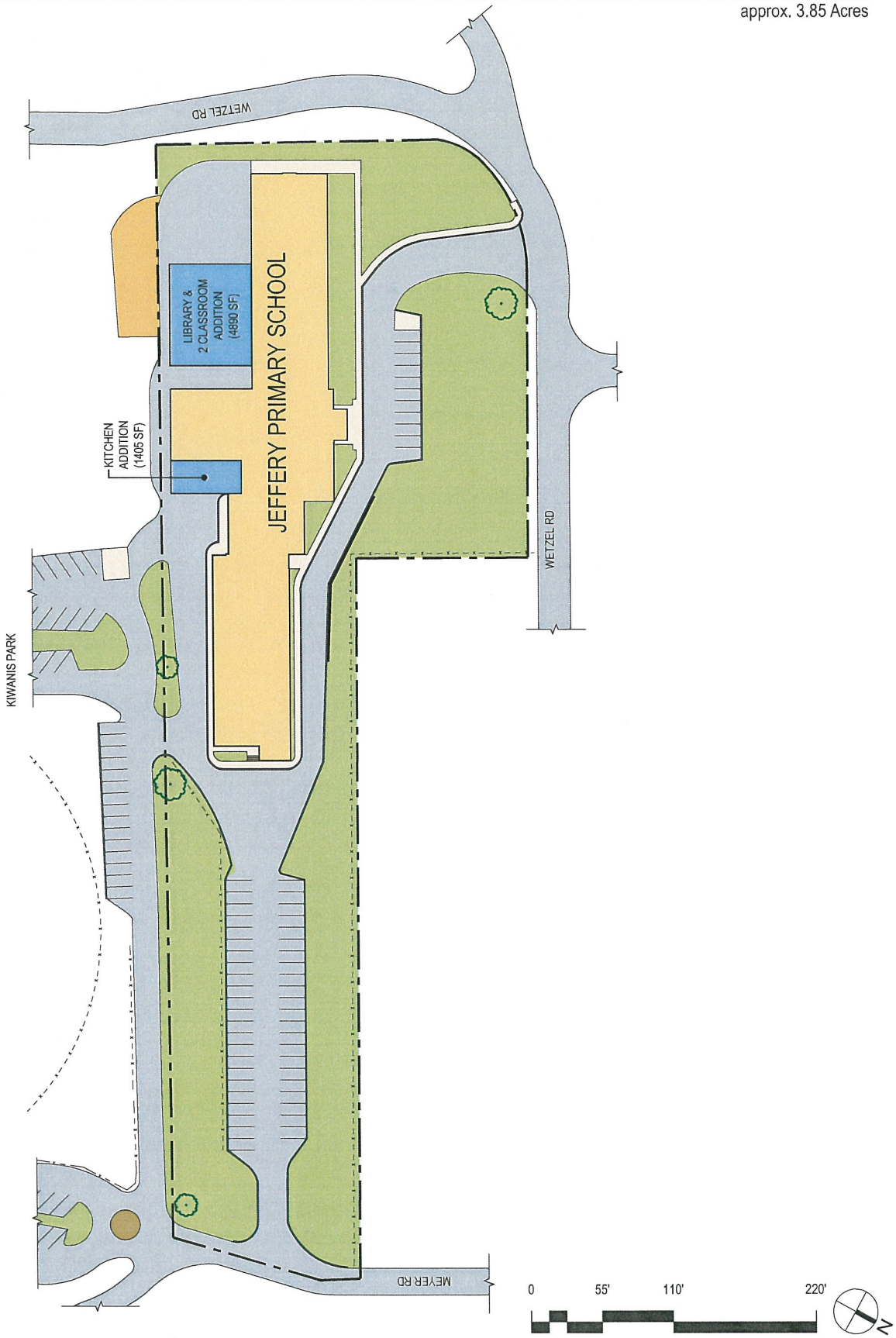
*** Elementary School Classroom availability was determined by assuming 25 students / class maximum.

**** PDE Capacities based on 25 students / classroom.

OPTION 2:

CLOSE ONE PRIMARY SCHOOL - RESERVE

approx. 3.85 Acres

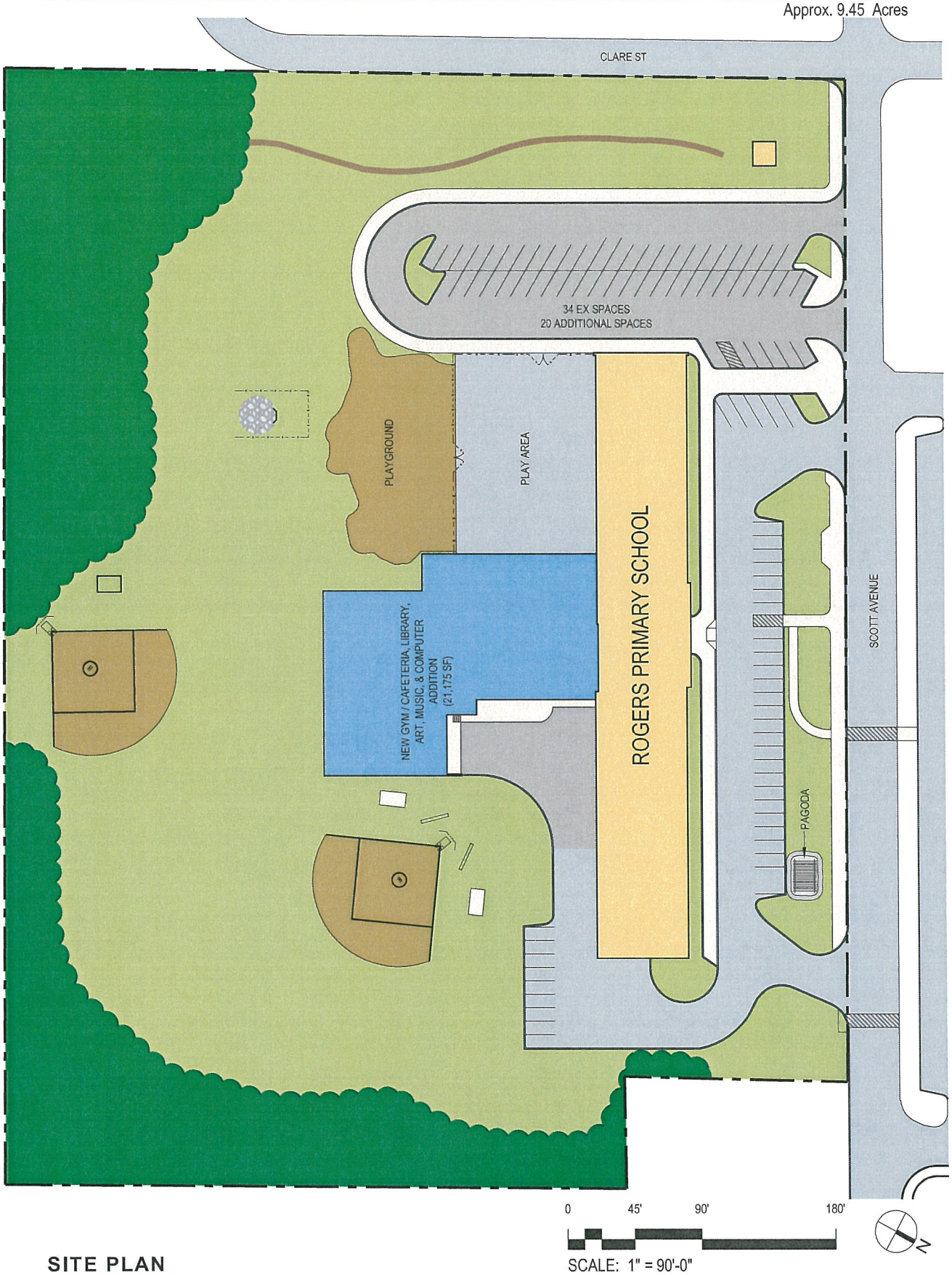


SCALE: 1" = 110'-0"

SITE PLAN

Option 2

Approx. 9.45 Acres



SCALE: 1" = 90'-0"

SITE PLAN

Option 2

approx. 9 Acres

SITE PLAN

SCALE: 1" = 110'-0"

BURCHFIELD PRIMARY SCHOOL

Option 2

approx. 10.75 Acres

0 50' 100' 200'

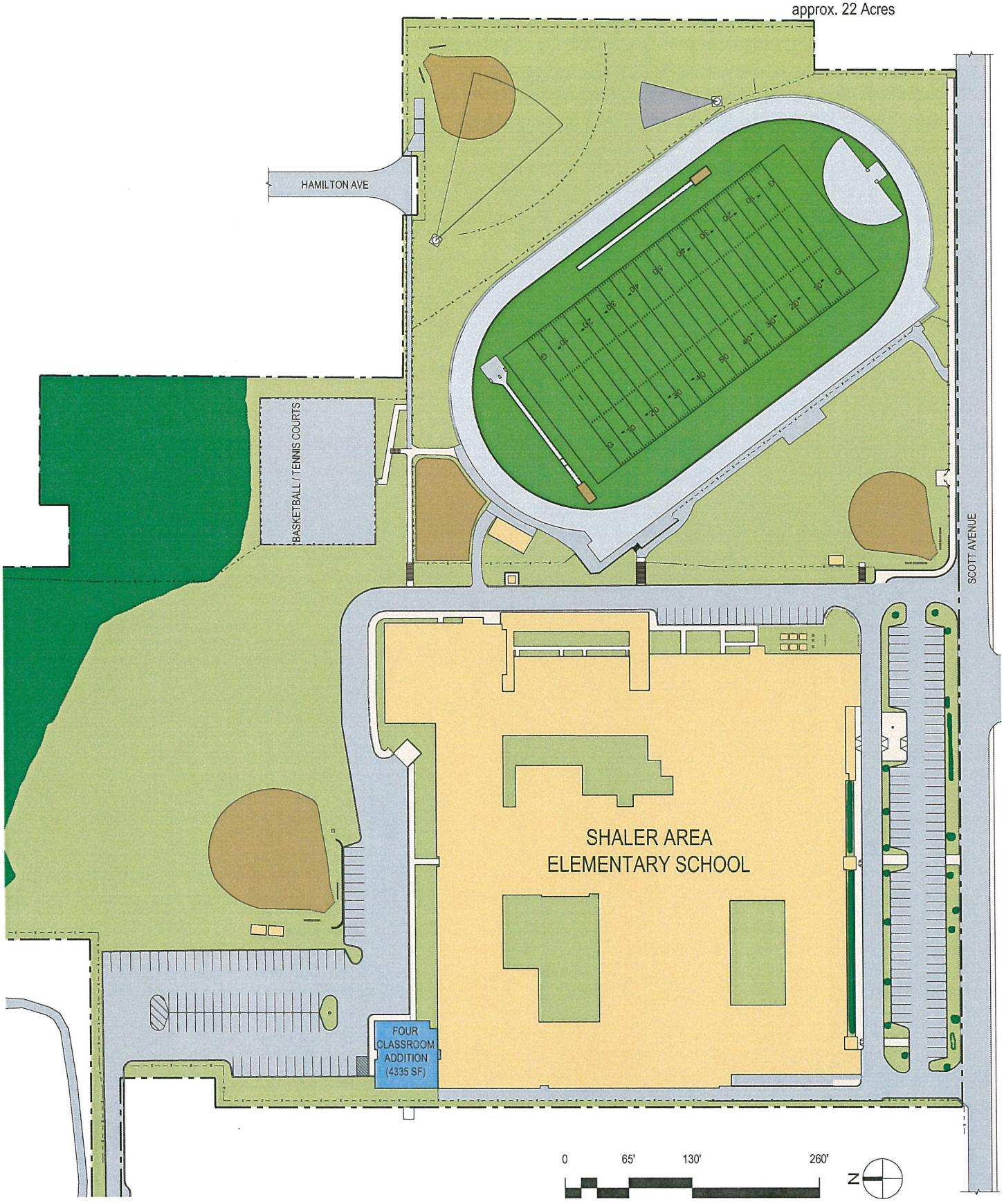
SCALE: 1" = 100'-0"

N

SITE PLAN

Option 2

approx. 22 Acres

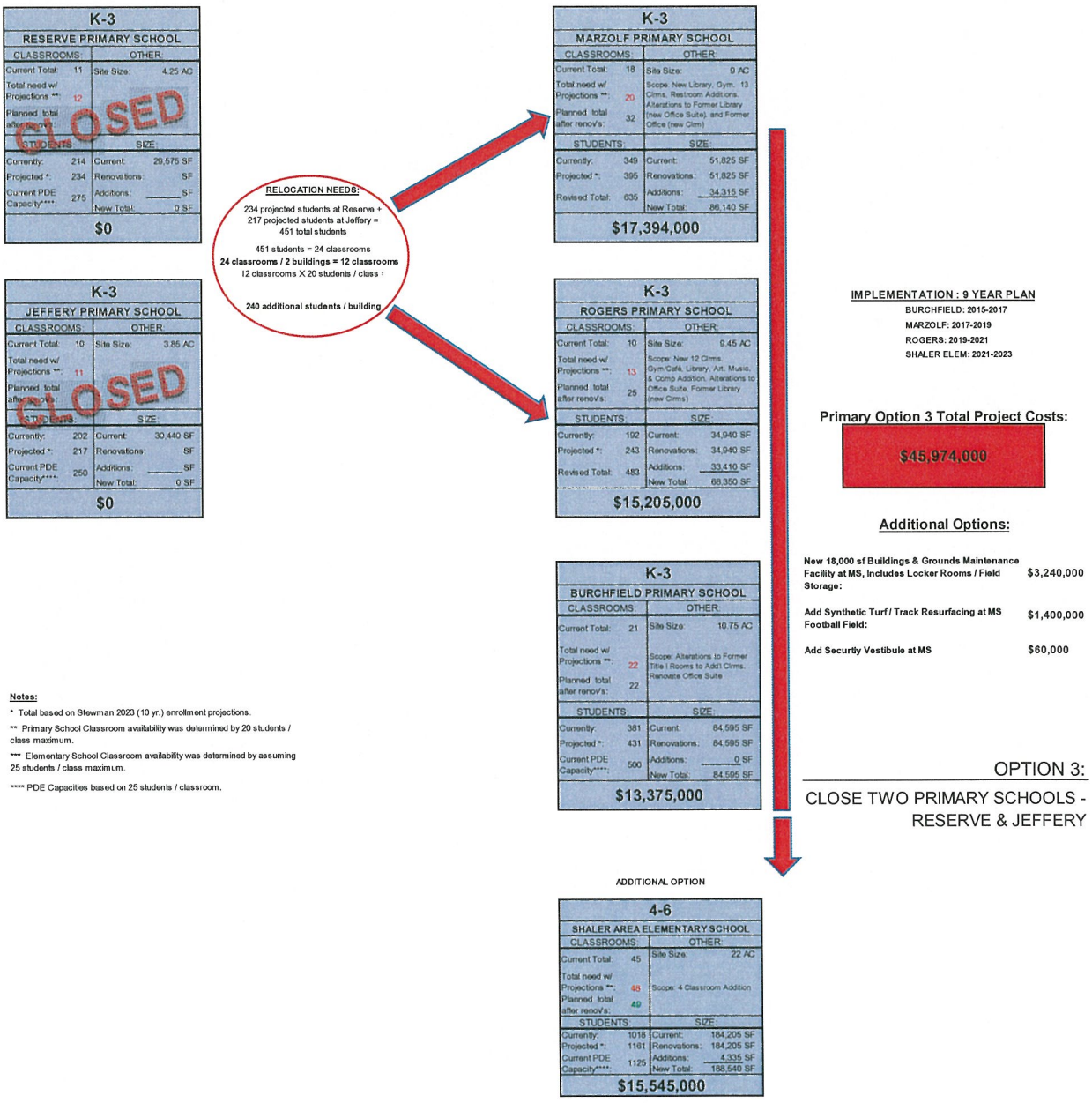


SITE PLAN

SCALE: 1" = 130'-0"

Option 3
Close Two Primary Schools - Reserve and Jeffery

PRIMARY / ELEMENTARY SCHOOL BUILDING CONFIGURATIONS



Notes:

* Total based on Stewman 2023 (10 yr.) enrollment projections.

** Primary School Classroom availability was determined by 20 students / class maximum.

*** Elementary School Classroom availability was determined by assuming 25 students / class maximum.

**** PDE Capacities based on 25 students / classroom.

IMPLEMENTATION : 9 YEAR PLAN

BURCHFIELD: 2015-2017
MARZOLF: 2017-2019
ROGERS: 2019-2021
SHALER ELEM: 2021-2023

Primary Option 3 Total Project Costs:

$45,974,000

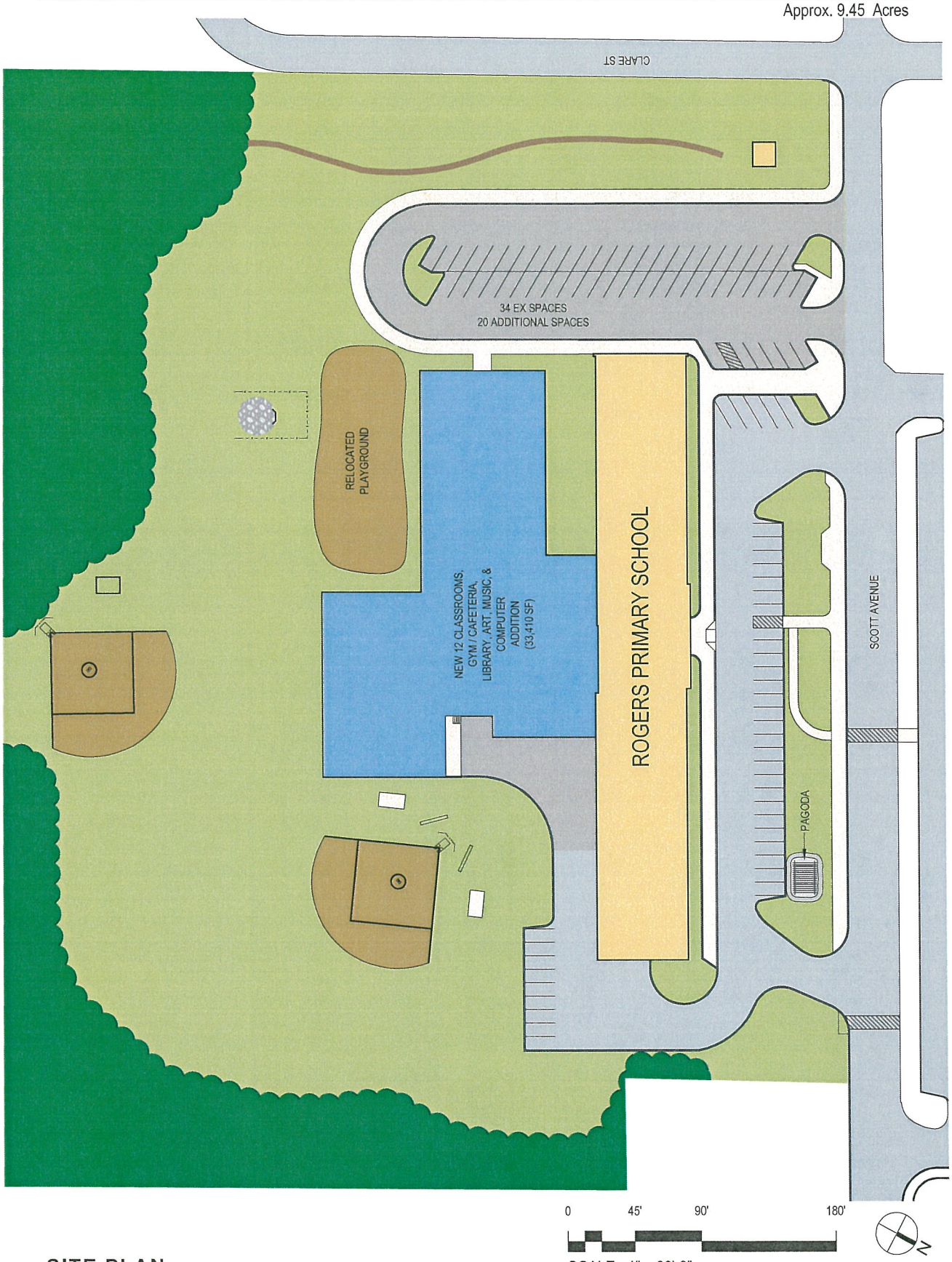
Additional Options:

New 18,000 sf Buildings & Grounds Maintenance Facility at MS, Includes Locker Rooms / Field Storage:	$3,240,000
Add Synthetic Turf / Track Resurfacing at MS Football Field:	$1,400,000
Add Securtiy Vestibule at MS	$60,000

OPTION 3:

CLOSE TWO PRIMARY SCHOOLS - RESERVE & JEFFERY

Approx. 9.45 Acres



SCALE: 1" = 90'-0"

SITE PLAN

approx. 9 Acres

SCALE: 1" = 110'-0"

SITE PLAN

Option 3

approx. 10.75 Acres

0 50' 100' 200'

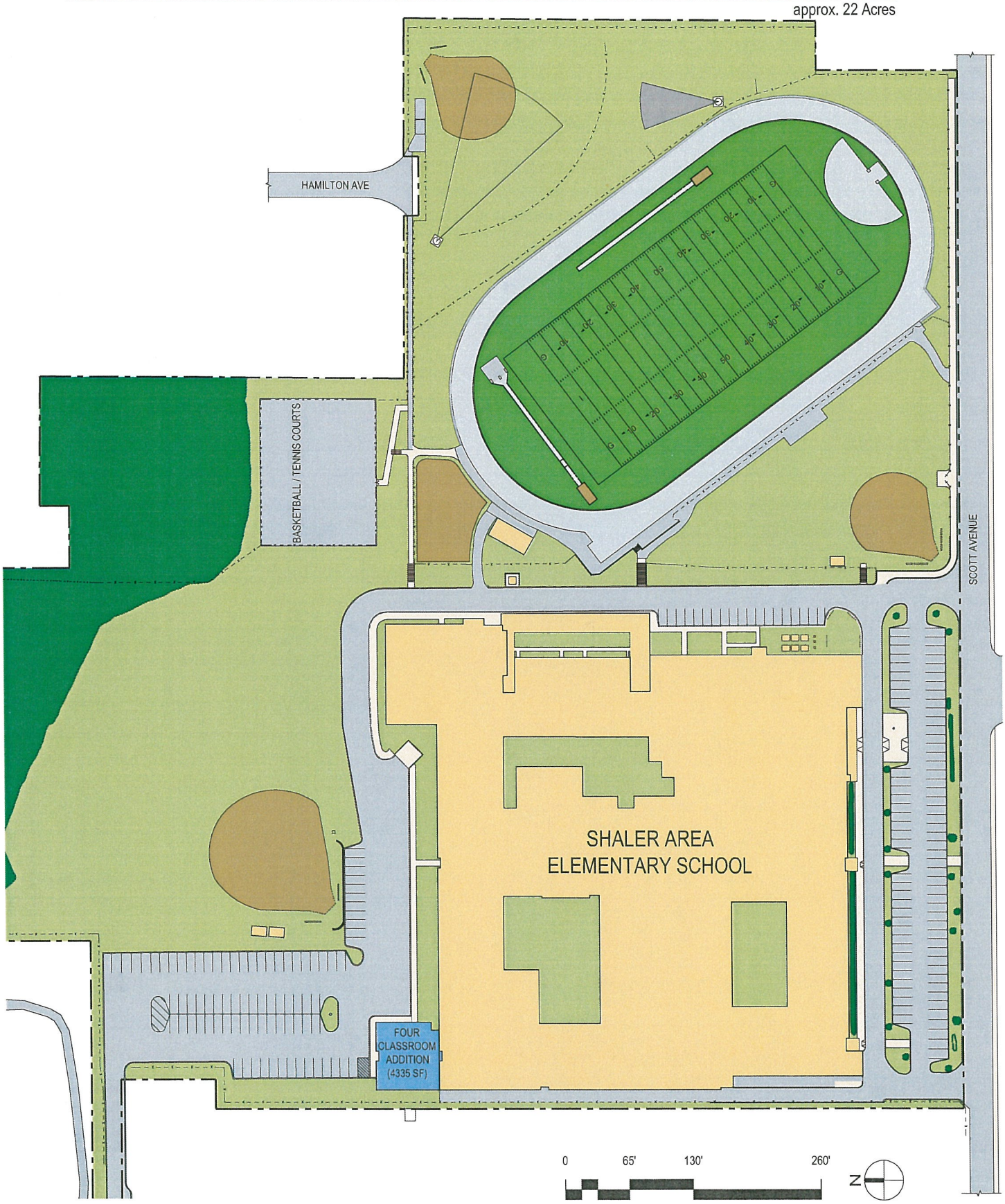
SCALE: 1" = 100'-0"

N

SITE PLAN

Option 3

approx. 22 Acres

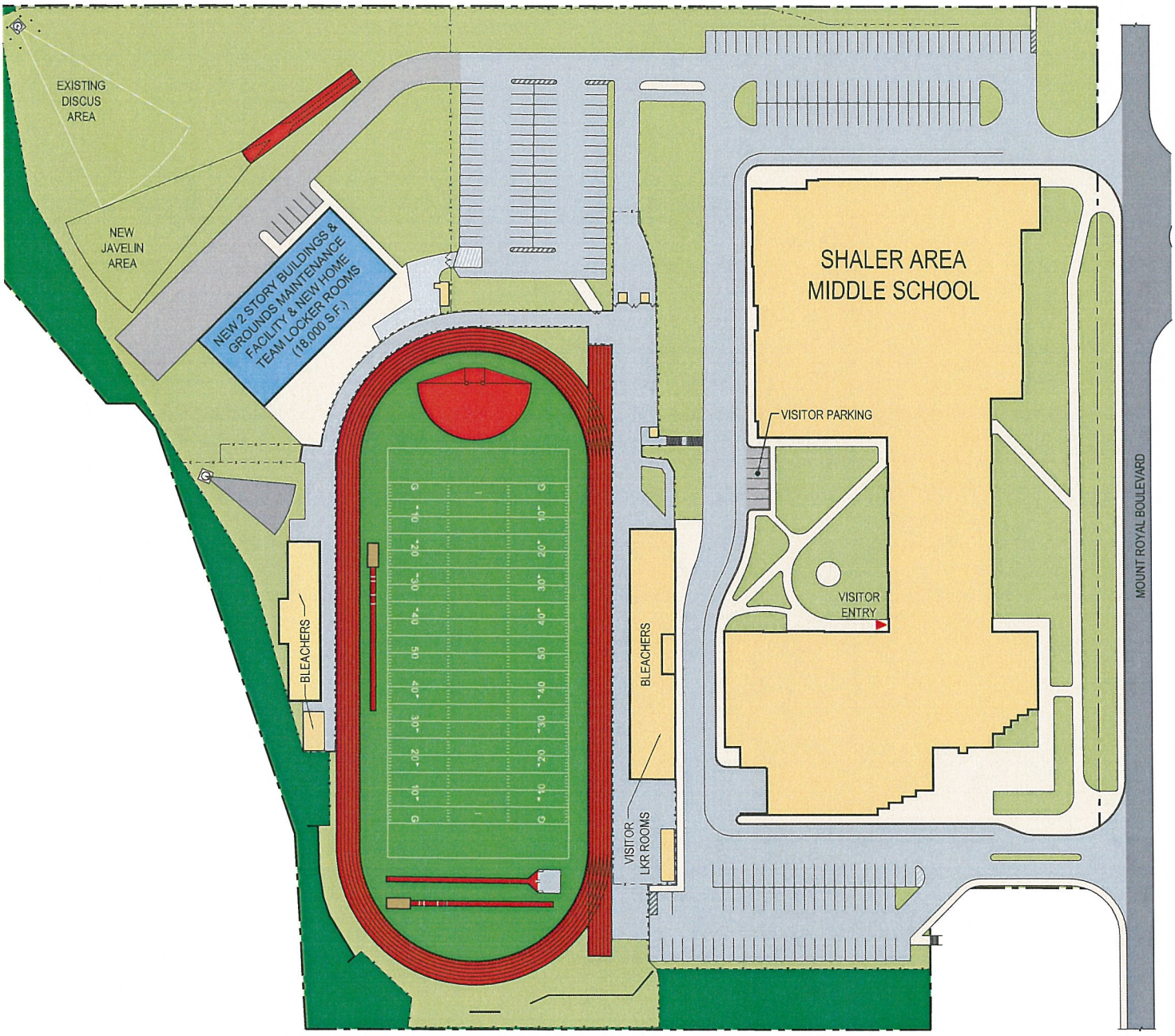


SITE PLAN

SCALE: 1" = 130'-0"

Additional Options

approx. 17.426 Acres



0 65' 130' 260'

SCALE: 1" = 130'-0"

SITE PLAN

ENLARGED SECOND FLOOR PLAN

Project Costs

PRIMARY AND ELEMENTARY SCHOOLS

	Option 1	Option 2	Option 3
Reserve Primary	$ 5,718,000	--	--
Jeffery Primary	$ 7,447,000	$ 7,447,000	--
Rogers Primary	$ 11,900,000	$ 11,900,000	$ 15,205,000
Marzolf Primary	$ 10,357,000	$ 17,394,000	$ 17,394,000
Burchfield Primary	$ 13,375,000	$ 13,375,000	$ 13,375,000

Option 1		
Construction Costs	$	39,036,000
Soft Costs	$	9,761,000
Total Project Costs	**$**	**48,797,000**
Option 2		
Construction Costs	$	40,092,000
Soft Costs	$	10,024,000
Total Project Costs	**$**	**50,116,000**
Option 3		
Construction Costs	$	36,779,000
Soft Costs	$	9,195,000
Total Project Costs	**$**	**45,974,000**

Additional Options	
Shaler Area Elem Renovation	$15,545,000
New Buildings & Grounds Facility	$3,240,000
MS Synthetic Turf / Track Resurfacing	$1,400,000
MS Security Vestibule	$60,000

This report was prepared to analyze the condition of the existing Primary and Elementary School buildings in the Shaler Area School District and determine the extent of necessary improvements. The report also provides options for the improvements and future utilization of the schools in consideration with projected enrollments, including a complete Demographic Study. The options were developed to be practical and efficient in the use of new and existing spaces.

The options presented are most beneficial in the areas of required educational spaces, secure entrances, safe traffic flow in the parking and driveway areas, exterior envelope improvements, interior finishes, handicap accessibility, energy conservation, renewed mechanical and electrical systems, infrastructure for technology, as well as the updating and enhancement of existing educational and athletic programs and equipment.

A comprehensive, reimbursable project provides these benefits. When analyzing the financial impact of long-term financing and state aid, a complete renovation will far outweigh the limited improvements achieved with short term, piece-meal, non-reimbursable capital improvements.

As the building program progresses, planning and design will become more refined and specific. The following expectations are among those which should be considered achievable:

- Improved educational programs, services and accessibility for students. This should be the driving factor in the building program.
- Adequate and efficient spaces for all educational services in the 21st century with little to no underutilized building areas.
- Funded improvements by the School District with assistance from the Pennsylvania Department of Education based upon substantiation of need.
- Clear and practical construction options that are understood and accepted by the general public.
- Improved facilities that comply with current building codes and educational standards and guidelines.
- Renewed facilities with extended useful life, and where major improvements should not be needed during the payback period.

The Board of School Directors is encouraged to pursue the construction option that best meets the needs of the students, administrators and community as a whole at the most reasonable cost as possible.

We at HHSDR express our gratitude to the Board and Administration for the contribution each has made towards the completion of this study.

APPENDIX

GENERAL

The enrollment projection model used by the Pennsylvania Department of Education (PDE) is patterned after projection models variously called educational progression or school retention. Projection models of this nature are based on the conception that students progress routinely from one grade to another and that any internal policies and external factors that influenced grade progression in the past will continue to influence the progression of students from grade to grade in the future.

The PDE model uses enrollment data reported annually by all local education agencies to the Division of Data Services on the Public School Enrollment Report (PDE-4035). Resident live birth data is provided by the Pennsylvania Department of Health. Grade progression is determined by calculating retention rates for grades 2 to 12 using the most recent five years of enrollment data. Retention rates for kindergarten are determined by births five years earlier and for first grade from births six years earlier. These rates are evaluated to determine if a pattern is discernable, or if any retention rates are unusual. If a pattern is found, the pattern is continued in making the projections. Unusual retention rates are discarded and the average of the remaining rates is used in making the projections. Non-graded elementary and secondary students are prorated across grades before retention rates are calculated. Because of the proration, the number of students shown in various grades will differ from the number of students reported. The total number of students may also differ slightly.

BASIC LIMITATIONS OF THE MODEL

1. Internal policy changes that can affect the accuracy of projections:
   a. Policy on how old a child must be before being admitted into kindergarten and first grade.
   b. Policy on when and how a student is evaluated for special education services.
   c. Policy on how many students the area vocational-technical school is to receive.
   d. Policy on who provides full-time special education programs.
   e. Policy on scholastic retention and acceleration.

2. External factors that can affect the accuracy of projections:
   a. The opening or closing of a non-public school.
   b. A significant increase or decrease in new home building.
   c. A shift in migration patterns.

3. Other considerations:
   a. Enrollment projections for School Districts with less than 1,000 students tend to be less reliable.
   b. Actual live birth data for the most recent year are added annually. However, live birth projections are <u>not</u> updated on an annual basis. Therefore, enrollment projections beyond five years are subject to errors in the lower grades resulting from inconsistencies between actual and projected live births and should be reviewed closely.

Basic Education Circulars (Purdon's Statutes)
{Updated} School Construction Reimbursement Criteria
24 P.S. §7-733

DATE OF ISSUE: September 1, 1997

DATE OF REVIEW: February 10, 2009; July 1, 2006; July 1, 2002; July 1, 1998

PURPOSE

The purpose of this Basic Education Circular (BEC) is to clarify existing policies governing requests for school construction reimbursement.

1. School districts must develop a complete building facility study of all district educational facilities including the district administration office. The study must be completed prior to, and within two years of, the date of the PlanCon Part A, Project Justification, submission. The study must provide an appraisal as to each facility's ability to meet current and planned educational program requirements, the degree to which the present facilities meet reasonably current construction standards, and an estimated cost of necessary repairs and improvements. Facility studies must contain documentation regarding the authors' credentials for producing the document.

2. A condition for all reimbursement is that the entire building be brought up to prevailing educational standards and reasonably current construction standards. The educational and construction standards applicable to a project will be determined by the Board of School Directors but must be based on applicable construction codes or professional guidelines.

3. School districts should evaluate their early childhood infrastructure as part of any renovation, expansion or new construction of an elementary school. For elementary school projects, school districts should consider providing enough space for pre-kindergarten, full-day kindergarten and preK-3 classes with no more than 17 students per teacher. Low interest loans through the Early Childhood Capital Investment Fund to support early childhood construction are available; information is available at our website:

   http://www.portal.state.pa.us/portal/server.pt/community/early_childhood_education/8698.

4. School districts are encouraged to consider the impact of acoustics, daylighting and other factors on academic effectiveness and building efficiency in the design process. To accomplish this, school administrators should consider the U.S. Green Building Council's Leadership in Energy and Environmental Design Green Building Rating System (LEED-NC™) standards or the Green Building Initiative's Green Globes™ Building Rating System.

   Additional state reimbursement is available for projects receiving silver, gold or platinum LEED-NC™ or two, three or four Green Globes™ certification. High Performance Green Schools Planning Grants for LEED-NC™- or LEED for Schools™-certified projects are also available to help defray costs which are not typically included in the design fee but which are critical to the design of a high performance building. The grants are funded by the State Public School Building Authority and jointly administered by the Governor's Green Government Council and the Pennsylvania Department of Education; information is available at www.gggc.state.pa.us.

5. Additions and renovations of existing buildings are eligible for additional state funding. Therefore, school districts are encouraged to consider building reuse (renovation or expansion) rather than new building construction. In addition, school construction projects should be planned in the context of sustainable community development.

6. School districts should take all reasonable efforts to preserve and protect school buildings that are on or eligible for local or National historic registers. If for safety, educational, economic, or other reasons, it is not feasible to renovate an existing school building, school districts are encouraged to develop an adaptive reuse plan for the building that incorporates an historic easement or covenant to avoid the building's abandonment or demolition.

7. For projects that involve the renovation of structures of more than one story which have wood framing (interior or exterior framing that is wholly or partially of wood), the district must describe the construction plans and methods designed to meet health and safety standards related to the use of wood in the building. This written description will be provided as a part of the PlanCon Part A, Project Justification.

8. The Commonwealth will not reimburse alteration or renovation costs for any building which is less than 20 years old or for which a reimbursable project has been approved within the preceding 20 years unless a request for a variance is approved by the Department. The request for a variance from this requirement must be presented in writing as a resolution of the Board of School Directors and must state the need for such unusual treatment. For all buildings, the time elapsed for this purpose shall be based on the period from the bid opening date of the last reimbursable project to the bid opening date of the planned project.

9. The Commonwealth will not reimburse costs for alterations or renovations to an existing school building (excluding costs specified in the Planning and Construction [PlanCon] Workbook) if the cost of alteration or renovation is less than twenty percent (20%) of the replacement value of the entire building unless a request for a variance is approved by the Department. The request for a variance from this requirement must be presented in writing as a resolution of the Board of School Directors and must state the need for such unusual treatment. The replacement value will be computed by multiplying the full-time equivalent (FTE) capacity of an existing facility by 92 square feet for elementary buildings and 123 square feet for secondary buildings multiplied by the cost of new construction, such cost to be determined annually by the Department.

   NOTE: The 20% rule does not apply to career and technical centers (CTCs).

10. Costs for asbestos abatement not greater than twenty percent (20%) of other approved alteration costs (i.e., alteration costs excluding the cost for asbestos abatement, roof replacement and site development) will be considered eligible for reimbursement as part of a PlanCon project. This policy does not change the calculations for determining the maximum formula amount for reimbursement.

11. Costs for roof replacement not greater than twenty percent (20%) of other approved alteration costs (i.e., alteration costs excluding the cost for asbestos abatement, roof replacement and site development) will be considered eligible for reimbursement as part of a PlanCon project. This policy does not change the calculations for determining the maximum formula amount for reimbursement.

REFERENCES:

Purdon's Statutes
24 P.S. §7-733
24 P.S. §25-2574
24 P.S. §25-2579

Department of Education Standards
22 Pa. Code, Chapter 349

CONTACT BUREAU/OFFICE:

Division of School Facilities
Bureau of Budget and Fiscal Management
Pennsylvania Department of Education
333 Market Street
Harrisburg, PA 17126-0333 Phone: 717.787.5480

INTRODUCTION

When a school district undertakes a major construction project and seeks reimbursement from the Commonwealth, a process known as PlanCon is initiated. PlanCon, an acronym for Planning and Construction Workbook, is a set of forms and procedures used to apply for Commonwealth reimbursement. The PlanCon forms are designed to: (1) document a local school district's planning process; (2) provide justification for a project to the public; (3) ascertain compliance with state laws and regulations; and (4) establish the level of state participation in the cost of the project.

DESCRIPTION OF PLANCON

Part A: "Project Justification" provides the description of a proposed project and the reasons it is needed.

Part B: "Schematic Design" is a technical review conference of the conceptual drawings, site plan and educational specifications. The architect and district administrator who is knowledgeable about the project and the educational program must be present at the schematic design conference.

Part C: "Site Acquisition" deals with the acquisition of land for school building projects or the purchase of a building for school or district administration office use. This part is completed only if land is acquired as part of the scope of the project.

Part D: "Project Accounting Based on Estimates" is concerned with estimated project costs. It is in this part that various "tests" of a district's financial ability to make payments are made. Chapter 21, Section 21.51, of the State Board of Education Regulations establishes cost constraints and Sections 7-701.1 and 7-7313 of the Public School Code of 1949, as amended, establish requirements for public hearings on school building projects. Part D also provides an estimate of state reimbursement.

Part E: "Design Development" is a conference to review architectural aspects of a project when the design is fully developed. The architect and a district administrator must be present at this review conference.

Part F: "Construction Documents" provides for further refinement of the architectural aspects of the project and documentation that other state and local agency requirements have been met or will be met before entering into construction contracts. Departmental approval of PlanCon Part F authorizes a district to receive bids and enter into construction contracts.

Part G: "Project Accounting Based on Bids" is concerned with actual bid prices. Approval of Part G authorizes a district to award construction contracts. The average time from submission of Part A to approval of Part G is approximately one year.

Part H: "Project Financing" addresses the financing used for a project. Calculation of the temporary reimbursable percent for a project's financing occurs at PlanCon part H. Once PlanCon Part H is approved, reimbursement on a project commences.

Part I: "Interim Reporting" provides for the reporting of change orders and/or supplemental contracts during construction.

Part J: "Project Accounting Based on Final Costs" is the final accounting for the project. The permanent reimbursable percent is calculated at PlanCon Part J.

Part K: "Project Refinancing" is used if a reimbursable bond issue is refunded, refinanced or restructured.

According to an American Association of School Administrators report, three-fourths of the school buildings in use today are living on borrowed time; they have outlived their predicted useful life. Twelve percent, or 1 building in 8, are inadequate places for learning. For five million children, school is "no place to learn."

As a nation, our school facilities are not keeping pace with growing expectations for American education. As we reshape education in America, we must also reshape our school facilities. Schools should be built for productivity. Every school building must be efficient, flexible, and functional enough to serve the changing dynamics of American education.

Equity issues are often directly reflected in the condition of school facilities - and those structural inequities can persist through the entire life of a school building.

Major problems that cause buildings to be inadequate include:

1. Too Old
2. Too Small, Not Enough Space
3. Building Not Structurally Sound
4. Poorly Maintained
5. Heating or Air Conditioning Bad or Non-existent
6. Electrical / Mechanical Systems Outdated / Poorly Maintained
7. Roof Repairs / Replacement
8. Insulation / Window Replacement
9. Asbestos
10. Energy Inefficient

The question has been raised, "What do we mean by poor facilities?" We are defining a poor facility as one which is 50 years old (and so is functionally obsolete) and is unable to accommodate modern technology properly. Poor facilities are also energy inefficient, and have become a financial burden to school districts and taxpayers in an era of escalating utility and operational costs.

In many other cases, the school building may not be in an overall poor state of repair, but does have elements of disrepair of obsolescence that, if left in place, will eventually create difficulties for staff to operate the building, or for teachers to conduct the educational process. Often these elements involve the heating, plumbing, mechanical systems. So, the decision facing an administrator then becomes "to what degree should the District renovate its facilities?"

The following concerns should be addressed when considering modernization or replacement of a school building:

1. *Safety*:
   If the building is not safe, or cannot be made safe, it is not a proper place for children.

2. *Education adequacy*:
   If the building cannot be adapted to meet the educational goals of the district and prevailing standards and codes, it should be abandoned.

3. *Location adequacy*:
   If the building is located in an area where there aren't enough students, or if projections indicate that there will not be enough students within the next few years, it does not make sense to keep the old building.

4. *Site adequacy*:
   If the site is too small to meet the current standards and safety and there is no way of adding to it, the building should be abandoned unless the district is willing to compromise.

5. *Economics*:
   If it is possible to provide academic programs equivalent to those offered elsewhere in the district in an existing building without expending more that 50% of the estimated cost of a new building, modernization becomes a feasible route and a sound investment. When those costs exceed 50%, the District then needs to carefully review the benefits new construction will provide to the educational program. This is based on a project additional life for the building from 20 to 30 years.

RATING DEFINITIONS

The buildings' physical condition was evaluated using Pennsylvania Department of Education standards and guidelines and applicable national, state and local codes and regulations. The following definitions were utilized for the buildings' overall condition rating.

Excellent: The building meets or exceeds the current PDE standards and all applicable codes and regulations. Spaces support the educational program, and site size is adequate for the grade levels served.

Good: The building meets most current PDE standards and most applicable codes and regulations. Certain areas have deficiencies (i.e. code compliance, substandard room, etc.) but are small in comparison to the overall condition.

Fair: The building meets some current PDE educational standards and some applicable codes and regulations. Certain areas require updating for code, room size, etc. The physical plant requires major work such as a new roof, a new HVAC system, etc.

Poor: The building does not meet the current PDE educational standards and the applicable codes and regulations. There may be no handicapped access, substandard room sizes and location, antiquated mechanical and electrical systems, no technology, leaking roof, etc. Poor does not mean the building structure is failing or the building is necessarily unsafe.

Energy Star
PORTFOLIO MANAGER

Statement of Energy Performance for Primary and Elementary Buildings and Buildings & Grounds Department

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Reserve Primary School 1030283024843

40

ENERGY STAR® Score[1]

Primary Property Function: K-12 School
Gross Floor Area (ft²): 29,575
Built: 1965

For Year Ending: September 30, 2013
Date Generated: June 12, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address
Reserve Primary School 1030283024843
2107 Lonsdale Street
Pittsburgh, Pennsylvania 15212-1305

Property Owner
Shaler Area School District
1800 Mount Royal Boulevard
Glenshaw, PA 15116-2117
412.492.1200

Primary Contact
J. Greer Hayden
40 Shenango Avenue
Sharon, PA 16146
724.981.8820
ghayden@hhsdr.com

Property ID: 3959226

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
92.6 kBtu/ft²

Source EUI
142.8 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,095,634 (76%)
Electric - Grid (kBtu)	644,464 (24%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	85.6
National Median Source EUI (kBtu/ft²)	131.9
% Diff from National Median Source EUI	8%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	242

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

J. Greer Hayden
40 Shenango Avenue
Sharon, PA 16146
724.981.8820
ghayden@hhsdr.com

Professional Engineer Stamp (if applicable)

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55

ENERGY STAR® Score[1]

Jeffery Primary School 1030283020457

Primary Property Function: K-12 School
Gross Floor Area (ft²): 30,440
Built: 1955

For Year Ending: October 31, 2013
Date Generated: June 12, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address
Jeffery Primary School 1030283020457
201 Wetzel Road
Glenshaw, Pennsylvania 15116-2236

Property Owner
Shaler Area School District
1800 Mount Royal Boulevard
Glenshaw, PA 15116-2117
412.492.1200

Primary Contact
J. Greer Hayden
40 Shenango Avenue
Sharon, PA 16146
724.981.8820
ghayden@hhsdr.com

Property ID: 3959224

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
93.6 kBtu/ft²

Source EUI
132.6 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,349,757 (82%)
Electric - Grid (kBtu)	499,323 (18%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	98.6
National Median Source EUI (kBtu/ft²)	139.6
% Diff from National Median Source EUI	-5%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	226

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

J. Greer Hayden
40 Shenango Avenue
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724.981.8820
ghayden@hhsdr.com

Professional Engineer Stamp (if applicable)

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51

ENERGY STAR® Score[1]

Rogers Primary School 103283020458

Primary Property Function: K-12 School
Gross Floor Area (ft²): 34,940
Built: 1960

For Year Ending: October 31, 2013
Date Generated: June 12, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address
Rogers Primary School 103283020458
705 Scott Avenue
Glenshaw, Pennsylvania 15116

Property Owner
Shaler Area School District
1800 Mount Royal Boulevard
Glenshaw, PA 15116-2117
412.492.1200

Primary Contact
J. Greer Hayden
40 Shenango Avenue
Sharon, PA 16146
724.981.8820
ghayden@hhsdr.com

Property ID: 3959227

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
85.7 kBtu/ft²

Source EUI
125.5 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,399,246 (80%)
Electric - Grid (kBtu)	594,091 (20%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	86.7
National Median Source EUI (kBtu/ft²)	127
% Diff from National Median Source EUI	-1%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	248

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

J. Greer Hayden
40 Shenango Avenue
Sharon, PA 16146
724.981.8820
ghayden@hhsdr.com

Professional Engineer Stamp (if applicable)

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Marzolf Primary School 1030283025101

47

ENERGY STAR® Score[1]

Primary Property Function: K-12 School
Gross Floor Area (ft²): 51,825
Built: 1968

For Year Ending: October 31, 2013
Date Generated: June 12, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address
Marzolf Primary School 1030283025101
101 Marzolf Road Extension
Pittsburgh, Pennsylvania 15209-1119

Property Owner
Shaler Area School District
1800 Mount Royal Boulevard
Glenshaw, PA 15116-2117
412.492.1200

Primary Contact
J. Greer Hayden
40 Shenango Avenue
Sharon, PA 16146
724.981.8820
ghayden@hhsdr.com

Property ID: 3959225

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
70.5 kBtu/ft²

Source EUI
117.9 kBtu/ft²

Annual Energy by Fuel

Electric - Grid (kBtu)	1,090,088 (30%)
Natural Gas (kBtu)	2,561,125 (70%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	69.1
National Median Source EUI (kBtu/ft²)	115.7
% Diff from National Median Source EUI	2%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	357

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

J. Greer Hayden
40 Shenango Avenue
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724.981.8820
ghayden@hhsdr.com

Professional Engineer Stamp (if applicable)

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ENERGY STAR® Score[1]

Burchfield Primary School 1030283024696

Primary Property Function: K-12 School
Gross Floor Area (ft²): 84,595
Built: 1964

For Year Ending: October 31, 2013
Date Generated: June 12, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Burchfield Primary School 1030283024696 1500 Burchfield Road Allison Park, Pennsylvania 15101-4000	Shaler Area School District 1800 Mount Royal Boulevard Glenshaw, PA 15116-2117 412.492.1200	J. Greer Hayden 40 Shenango Avenue Sharon, PA 16146 724.981.8820 ghayden@hhsdr.com

Property ID: 3959222

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
87.3 kBtu/ft²

Source EUI
135 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	1,754,938 (24%)
Natural Gas (kBtu)	5,631,865 (76%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	71.8
National Median Source EUI (kBtu/ft²)	111.1
% Diff from National Median Source EUI	22%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	656

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

J. Greer Hayden
40 Shenango Avenue
Sharon, PA 16146
724.981.8820
ghayden@hhsdr.com

Professional Engineer Stamp (if applicable)

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20

ENERGY STAR® Score[1]

Shaler Area Elementary School 1030283027558

Primary Property Function: K-12 School
Gross Floor Area (ft²): 184,205
Built: 1959

For Year Ending: October 31, 2013
Date Generated: August 27, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Shaler Area Elementary School 1030283027558 700 Scott Avenue Glenshaw, Pennsylvania 15116	Shaler Area School District 1800 Mount Royal Boulevard Glenshaw, PA 15116-2117 412.492.1200	J. Greer Hayden 40 Shenango Avenue Sharon, PA 16146 724.981.8820 ghayden@hhsdr.com

Property ID: 3959251

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
119.3 kBtu/ft²

Source EUI
207 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	7,203,106 (33%)
Natural Gas (kBtu)	14,769,658 (67%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	91.9
National Median Source EUI (kBtu/ft²)	159.4
% Diff from National Median Source EUI	30%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	2,248

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

J. Greer Hayden
40 Shenango Avenue
Sharon, PA 16146
724.981.8820
ghayden@hhsdr.com

Professional Engineer Stamp (if applicable)

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Shaler Area Buildings and Grounds Department

Primary Property Function: Repair Services (Vehicle, Shoe, Locksmith, etc.)
Gross Floor Area (ft²): 5,000
Built: 1970

For Year Ending: October 31, 2013
Date Generated: June 12, 2014

ENERGY STAR® Score[1]

N/A

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
Shaler Area Buildings and Grounds Department 1660 Butler Plank Road Glenshaw, Pennsylvania 15116-1730	Shaler Area School District 1800 Mount Royal Boulevard Glenshaw, PA 15116-2117 412.492.1200	J. Greer Hayden 40 Shenango Avenue Sharon, PA 16146 724.981.8820 ghayden@hhsdr.com

Property ID: 3959258

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
147.2 kBtu/ft²

Source EUI
256.8 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	491,262 (67%)
Electric - Grid (kBtu)	244,616 (33%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	57.5
National Median Source EUI (kBtu/ft²)	100.4
% Diff from National Median Source EUI	156%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	76

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

J. Greer Hayden
40 Shenango Avenue
Sharon, PA 16146
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ghayden@hhsdr.com

Professional Engineer Stamp (if applicable)

Stewman Demographics

Tables from Demographic School Analysis

Table 1

Annual Number of Births to Shaler Area School District Residents by Municipality and Year: 1990-2011[7]

Year	Etna Boro	Millvale Boro	Reserve Township	Shaler Township	Total
1990	***50***	69	40	***413***	***572***
1991	62	61	40	393	556
1992	39	59	46	402	546
1993	40	56	36	420	552
1994	66	49	53	397	565
1995	46	49	33	***352***	***480***
1996	45	54	***45***	298	442
1997	47	43	33	392	515
1998	50	50	***42***	309	451
1999	51	56	***43***	***302***	452
2000	45	45	44	306	440
2001	53	44	32	296	425
2002	46	36	32	269	***383***
2003	33	43	29	297	402
2004	38	37	34	298	407
2005	34	50	33	276	393
2006	49	***56***	35	276	416
2007	39	***57***	31	295	422
2008	40	***56***	42	286	424
2009	30	***55***	30	310	425
2010	***52***	***55***	28	283	418
2011	48	41	45	324	458
∑ 1990-1994	257	294	215	2,025	2,791
∑ 1995-1999	239	252	196	1,653	2,340
∑ 2000-2004	215	205	171	1,466	2,057
∑ 2005-2009	192	274	171	1,443	2,080
∑ 2010-2011	100	96	73	607	876
Average/Year					
1990-1994	51.4	58.8	43.0	405.0	558.2
1995-1999	47.8	50.4	39.2	330.6	468.0
2000-2004	43.0	41.0	34.2	293.2	411.4
2005-2009	38.4	54.8	34.2	288.6	416.0
2010-2011	50.0	48.0	36.5	303.5	438.0

[7] Source: Allegheny County Health Department

Δ_1	-3.6	-8.4	-3.8	-74.4	-90.2
Δ_2	-4.8	-9.4	-5.0	-37.4	-56.6
Δ_3	-4.6	+13.8	0	-4.6	+4.6
Δ_4	+11.6	-6.8	+2.3	+14.9	+22.0

Table 2

Number of Births by Age of Mother and Year for Shaler Area School District Residents·

		15-19	20-24	25-29	30-34	35-39	40-44	45+	∑
1990-1994	1990	27	80	215	188	54	8	0	572
	1991	17	82	204	189	53	10	0	556
	1992	20	61	201	194	62	7	1	546
	1993	20	61	189	201	72	9	0	552
	1994	25	49	191	201	85	13	1	565
	∑	109	333	1,000	973	326	47	2	2,791
	% of ∑	.039	.119	.358	.349	.117	.017	.001	
	Avg/Yr	21.8	66.6	200.0	194.6	65.2	9.4	0.4	558.2
1995-1999	1995	14	60	147	190	62	7	0	480
	1996	20	57	135	162	61	7	0	442
	1997	24	47	146	220	63	13	2	515
	1998	17	50	128	162	86	8	0	451
	1999	23	56	130	155	79	9	0	452
	∑	98	270	686	889	351	44	2	2,340
	% of ∑	.042	.115	.293	.380	.150	.019	.001	
	Avg/Yr	19.6	54.0	137.2	177.8	70.2	8.8	0.4	468.0
2000-2004	2000	12	51	119	172	70	16	0	440
	2001	10	62	113	160	66	14	0	425
	2002	17	45	91	147	67	16	0	383
	2003	17	58	107	139	69	11	1	402
	2004	13	63	119	139	62	11	0	407
	∑	69	279	549	757	334	68	1	2,057
	% of ∑	.034	.136	.267	.368	.162	.033	0	
	Avg/Yr	13.8	55.8	109.8	151.4	66.8	13.6	0.2	411.4
2005-2009	2005	17	46	114	126	72	13	4	393
	2006	16	50	151	127	64	8	0	416
	2007	13	64	144	118	65	18	0	422
	2008	24	69	123	135	60	11	1	424
	2009	20	75	139	129	49	9	4	425
	∑	90	304	671	635	310	59	9	2,080
	% of ∑	.043	.146	.322	.305	.149	.028	.004	
	Avg/Yr	18.0	60.8	134.2	127.0	62.0	11.8	1.8	416.0
2010-2011	2010	13	64	155	126	53	7	0	418
	2011	19	67	146	161	58	6	1	458
	∑	32	131	301	287	111	13	1	876
	% of ∑	.037	.150	.344	.328	.127	.015	.001	
	Avg/Yr	16.0	65.5	150.5	143.5	55.5	6.5	0.5	438.0

· Source: Allegheny County Health Department; the Totals for 1991, 2005 & 2008 contain 1 unknown age female each.

	Δ[1]	15-19	20-24	25-29	30-34	35-39	40-44	45+	∑
	Δ_1	-2.2	-12.6	-62.8	-16.8	+5.0	-0.6	0	-90.2
	Δ_2	-5.8	+1.8	-27.4	-26.4	-3.4	+4.8	-0.2	-56.6
	Δ_3	+4.2	+5.0	+24.4	-24.4	-4.8	-1.8	+1.6	+4.6
	Δ_4	-2.0	+4.7	+16.3	+16.5	-6.5	-5.3	-1.3	+22.0
	Δ of %	↓-.002	↑+.031	↓-.014	↓ -.021	↑+.010	↓-.002	0	

[1] The Δ's are defined as follows: Δ_1: (1995-1999 average) - (1990-1994 average); Δ_2: (2000-2004 average) - (1995-1999 average); Δ_3: (2005-2009 average) - (2000-2004 average); and Δ_4: (2010-2011 average) - 2005-2009 average); Δ of % are for (1990-94 average) → (2010-2011 average)

Table 3

Shift in Reproductive Age Female Population in Shaler Area School District Municipalities: 1990-2000-2010

Five Year Age Groups											
1990						2000					
15-19	20-24	25-29	30-34	35-39	40-44	15-19	20-24	25-29	30-34	35-39	40-44
251	302	557	575	483	394	311	228	378	532	593	572

Change from 1990	15-19	20-24	25-29	30-34	35-39	40-44
	+60	-74	-179	-43	+110	+178
Percent Change						
Total	+23.9%	-24.8%	-32.1%	-7.5%	+22.8%	+45.2%

Five Year Age Groups											
2000						2010					
15-19	20-24	25-29	30-34	35-39	40-44	15-19	20-24	25-29	30-34	35-39	40-44
311	228	378	532	593	572	358	243	387	469	585	601

Change from 1990	15-19	20-24	25-29	30-34	35-39	40-44
	+47	+15	+9	-63	-8	+29
Percent Change	+15.1%	+6.6%	+2.4%	-11.8%	-1.3%	+5.1%

Table 4

I. Summary of Births and Change in Births by Age Cohort 1990-1994 and 2000-2004

	1990-1994	2000-2004	Δ	Percentage Δ
15-19	109	69	-40	-.367
20-24	333	279	-54	-.162
25-29	1000	549	-451	-.451
30-34	973	757	-216	-.222
35-39	326	334	+8	+.025
40-44	49	69	+20	+.408

II. Summary of Births and Change in Births by Age Cohort 1995-1999 and 2005-2009

	1995-1999	2005-2009	Δ	Percentage Δ
15-19	98	90	-8	-.082
20-24	270	304	+34	+.126
25-29	686	671	-15	-.022
30-34	889	635	-254	-.286
35-39	351	310	-41	-.117
40-44	46	68	+22	+.478

Table 5

I. Age-Specific Shifts in Births Relative to Age-Specific Shifts in Number of Reproductive Age Females (NRAF) (Forward, 1990→2000)

	A	B	C
	Shifts in Births (1990-94)-(2000-2004)	Shifts in NRAF (1990-2000)	Δ (A-B)
15-19	-.367	+.023	-.390
20-24	-.162	- .336	+.174
25-29	***-.451***	***- .392***	- .059
30-34	***-.222***	***- .210***	- .012
35-39	***+.025***	***+ .018***	+.007
40-44	***+.408***	***+ .307***	+.101

II. Age-Specific Shifts in Births Relative to Age-Specific Shifts in Number of Reproductive Age Females (NRAF) (Backward, 2000→2010)

	A	B	C
	Shifts in Births (1995-99)-(2005-2009)	Shifts in NRAF (2000-2010)	Δ (A-B)
15-19	-.082	-.014	-.068
20-24	***+.126***	***+.145***	-.019
25-29	-.022	+.121	-.143
30-34	***-.286***	***-.224***	-.062
35-39	-.117	-.355	+.238
40-44	+.478	-.260	+.738

Table 6[β]

Shifts in Age Cohorts of Females in the United States in Pennsylvania and Allegheny County: 1990-2010

	United States			Pennsylvania			Allegheny County		
	1990[α]	2000	2010	1990	2000	2010	1990	2000	2010
0-4	8962	9365	9882	387926	355356	356322	41156	34721	31110
5-9	8837	10026	9959	383947	403701	369276	39193	38610	31588
10-14	***8347***	10008	10097	***368709***	420247	385924	***36073***	40548	33460
15-19	***8651***	9829	10736	***402320***	417294	442601	***40160***	39916	39221
20-24	9345	***9276***	10572	432692	***373203***	432260	47352	***37861***	45020
25-29	10617	***9583***	10466	503220	***366399***	388958	53801	***38593***	42309
30-34	10986	10189	***9966***	466320	417281	***364911***	59283	43097	***36047***
35-39	10061	11388	***10138***	418201	482595	***384115***	54269	49714	***34921***
40-44	8924	11313	10497	337594	504367	429693	47016	54439	39203

Change by Age Cohort Across Time[β]

	United States		Pennsylvania		Allegheny County	
	x(2000)-x(1990)	x(2010)-x(2000)	x(2000)-x(1990)	x(2010)-x(2000)	x(2000)-x(1990)	x(2010)-x(2000)
0-4	+403k (+4.5%)	+517k (+5.5%)	-32570 (-8.4%)	+966 (+0.3%)	-6435(-15.6%)	-3611 (-10.4%)
5-9	+1189k(+13.5%)	-67k (-0.7%)	+19754 (+5.1%)	-34425 (-8.5%)	-583(-1.5%)	-7022 (-18.2%)
10-14	+1661k(+19.9%)	+89k (+0.9%)	+51538(+14.0%)	-34323 (-8.2%)	+4475(+12.4%)	-7088 (-17.5%)
15-19	+1178k +13.6%)	+907k (+9.3%)	+14974 (+3.7%)	+25307 (+6.1%)	-244(-0.6%)	-695 (-1.7%)
20-24	***-69k (-0.7%)***	+1296k(+14.0%)	***-59489 (-13.7%)***	+59057 (+15.8%)	-9491(-20.0%)	+7159 (+18.9%)
25-29	***-1034k (-9.7%)***	+883k (+9.2%)	***-136821 (-27.2%)***	+22559 (+6.2%)	-15208(-28.3%)	+3716 (+9.6%)
30-34	-797k (-7.3%)	***-223k (-2.3%)***	-49039 (-10.5%)	***-52370 (-12.6%)***	-16186(-27.3%)	***-7050 (-16.4%)***
35-39	+1327k(+13.2%)	***-1250k (-11.0%)***	+64394 (+15.4%)	***-98480 (-20.4%)***	-4555(-8.4%)	***-14793 (-29.8%)***
40-44	+2389k(+26.8%)	-816k (-7.2%)	+166773 (+49.4%)	-74674 (-14.8%)	+7423(+15.8%)	-15236 (-28.0%)

Table 6 (cont'd)
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[β] Sources: (1) 1990 , 2000 and 2010 Data: U.S Census Bureau, Decennial Census

[α] In thousands e.g., 8,962 is 8,962,000 or 8.962 million

[β] Cross-Sectionally by Period; in other words, change (Δ) in age group x in 1990 vs. 2000 for the same age group x.

CHANGE WITHIN AGE COHORT ACROSS TIME[a]

	United States		Pennsylvania		Allegheny County	
	1990→2000	2000→2010	1990→2000	2000→2010	1990→2000	2000→2010
	X→X+10[b]	X→X+10	X→X+10	X→X+10	X→X+10	X→X+10
0-4	+1046K (+11.7%)	+732K(+7.8%)	+32321 (+8.3%)	+30568 (+8.6%)	-608(-1.5%)	-1261 (=3.6%)
5-9	+992K (+11.2%)	+710K(+7.1%)	+33347 (+8.9%)	+38900 (+9.6%)	+723(+1.8%)	+611 (+1.6%)
10-14	+929K (+11.1%)	+566K(+5.7%)	-4494 (-1.2%)	+12013 (+2.9%)	+1788(+5.0%)	+4502 (+11.1%)
15-19	+932K (+10.8%)	+637K(+6.5%)	-35921 (-8.9%)	-28335 (-6.8%)	-1567(-3.9%)	+2393 (+6.0%)
20-24	+844K (+9.0%)	+690K(+7.4%)	-15411 (-3.6%)	-8292 (-2.2%)	-4275(-9.0%)	-1814 (-4.8%)
25-29	+771K (+7.3%)	+555K(+5.8%)	-20625 (-4.1%)	+17716 (+4.8%)	-4087(-7.6%)	-3672 (-9.5%)
30-34	+327K (+3.0%)	+308K(+3.0%)	-38047 (-8.2%)	+10412 (+2.5%)	-4844(-8.2%)	-3894 (-9.0%)
35-39						
40-44						

[a] Longitudinally following an age cohort over time, including net migration; in other words change (Δ) in age cohort x in 1990 vs. age cohort x+10 in 2000 and for age cohort x in 2000 vs. age cohort x+10 in 2010. The age cohorts include net migration.

[b] For example, A) the female age cohort 0-4 in 1990 (8,962) compared to B) the female age cohort 10-14 in 2000 (1,008) that is, B-A.

Table 7

Changes in Population Age Distribution for Residents Living in the Shaler Area School District Over the Past Decade Due to Migration vs. Cohort Replacement[8]: 2000 and 2010

Age	2000 Pop	Birth Years		2010 Pop	Birth Years		Δ Net Migration & Aging	Δ Cohort Replacement
<5	2,231	1996-2000	EB4[2]	1,978	2006-2010			-253 (-11%)
5-9	2,633	1991-95	EB3	1,946	2001-2005			-687 (-26%)
10-14	2,776	1986-90	EB2	2,152	1996-2000	EB4	-79 (-4%)	-624 (-22%)
15-19	2,421	1981-85	EB1	2,368	1991-95	EB3	-265 (-10%)	-53 (-2%) EB→EB
20-24	1,817	1976-80	bb2	1,976	1986-90	EB2	-800 (-29%)	***+159 (+9%) bb→EB***
25-29	2,115	1971-75	bb1	2,466	1981-85	EB1	***+45 (+2%)***	***+351(+17%) bb→EB***
30-34	2,883	1966-70		2,321	1976-80	bb2	***+504 (+28%)***	- 562 (-19%) TC →bb
35-39	3,370	1961-65	BB4	2,209	1971-75	bb1	***+94 (+4%)***	-1,161(-34%) BB→bb
40-44	3,633	1956-60	BB3	2,630	1966-70		-253 (-9%)	-1,003 (-28%) BB→TC
45-49	3,210	1951-55	BB2	3,185	1961-65	BB4	-185 (-5%)	-25 (-1%) BB→BB
50-54	2,668	1946-50	BB1	3,380	1956-60	BB3	-253 (-9%)	***+712 (+27%) BB→BB***
55-59	2,223	1941-45		3,065	1951-55	BB2	-145 (-5%)	***+842 (+38%) → BB***
60-64	2,102	1936-40	De2	2,428	1946-50	BB1	-240 (-9%)	***+326 (+16%) De→BB***
65-69	1,979	1931-35	De1	1,924	1941-45		-299 (-13%)	-55 (-3%)
70-74	2,098	1926-30		1,682	1936-40	De2	-420 (-20%)	-416 (-20%)
75-79	1,623	1921-25		1,417	1931-35	De1	-562 (-28%)	-206 (-13%)
80-84	1,104	1916-20		1,243	1926-30		-855 (-41%)	***+139 (+13%)***
85-89	504	Pre-1916		648	Pre-1926		-975 (-60%)	***+144 (+29%)***
90+	175			267			-837 (-76%)	***+92 (+53%)***
Total	41,565			39,285				-2,280 (-5%)

[8] Data Sources:
(1) 2000 and 2010: US Decennial Census

[2] EB: Echo Boom Cohort; BB: Baby Boom Cohort; bb: Baby Bust Cohort; De: Great Depression Cohort; TC: Transition Cohort between Baby Boom & baby bust

Table 8

Total Fertility Rate for the United States: 1917-2007*

1917	3.33	1942	2.63	1967	2.56	1992	2.05
1918	3.31	1943	2.72	1968	2.46	1993	2.02
1919	3.07	1944	2.57	1969	2.46	1994	2.00
1920	3.26	1945	2.49	1970	2.48	1995	1.98
1921	3.33	1946	2.94	1971	2.27	1996	1.98
1922	3.11	1947	3.27	1972	2.01	1997	1.97
1923	3.10	1948	3.11	1973	1.88	1998	2.00
1924	3.12	1949	3.11	1974	1.84	1999	2.01
1925	3.01	1950	3.09	1975	1.77	2000	2.06
1926	2.90	1951	3.27	1976	1.74	2001	2.03
1927	2.82	1952	3.36	1977	1.79	2002	2.01
1928	2.66	1953	3.42	1978	1.76	2003	2.04
1929	2.53	1954	3.54	1979	1.81	2004	2.05
1930	2.53	1955	3.58	1980	1.84	2005	2.05
1931	2.40	1956	3.69	1981	1.81	2006	2.10
1932	2.32	1957	3.77	1982	1.83	2007	2.12
1933	2.17	1958	3.70	1983	1.80	2008	2.07
1934	2.23	1959	3.71	1984	1.81	2009	2.00
1935	2.19	1960	3.65	1985	1.84	2010	1.93
1936	2.15	1961	3.62	1986	1.84		
1937	2.17	1962	3.46	1987	1.87		
1938	2.22	1963	3.32	1988	1.93		
1939	2.17	1964	3.19	1989	2.01		
1940	2.30	1965	2.91	1990	2.08		
1941	2.40	1966	2.72	1991	2.06		

* Data Sources: (1) 1917-39 "Trends in Fertility in the United States," U.S. Dept. of Health, Education and Welfare, 1977, Table 13, DHEW Pub #78-1906;
(2) 1940-1980 Vital Statistics of the United States, Vol. 1, Natality, 2003. Table 1-7.
(3) 1980-2007 "Births: Final Data for 2007" National Vital Statistics Reports, Vol. 58, No. 24, August 2010, Table 4 (Department of Health and Human Services).
(4) 2008-2010 National Vital Statistics Reports, Vol. 61, No.1, August 2012.

Table 9

Total Fertility Rate for the United States— White and White (non-Hispanic): 1970-2007

	ALL	White (including Hispanic)	White (non-Hispanic)	Hispanic		ALL	White (including Hispanic)	White (non-Hispanic)	Hispanic
1970	2.5	2.4			1990	2.1	2.0	1.9	3.0
1971	2.3	2.2			1991	2.1	2.0	1.8	3.0
1972	2.0	1.9			1992	2.1	2.0	1.8	3.0
1973	1.9	1.8			1993	2.0	2.0	1.8	2.9
1974	1.8	1.7			1994	2.0	2.0	1.8	2.8
1975	1.7	1.7			1995	2.0	2.0	1.8	2.8
1976	1.7	1.7			1996	2.0	2.0	1.8	2.8
1977	1.8	1.7			1997	2.0	2.0	1.8	2.7
1978	1.7	1.7			1998	2.1	2.0	1.8	2.7
1979	1.8	1.7			1999	2.1	2.0	1.8	2.6
1980	1.8	1.8			2000	2.1	2.1	1.9	2.7
1981	1.8	1.7			2001	2.0	2.0	1.8	2.7
1982	1.8	1.8			2002	2.0	2.0	1.8	2.7
1983	1.8	1.7			2003	2.0	2.1	1.9	2.7
1984	1.8	1.7			2004	2.0	2.1	1.9	2.8
1985	1.8	1.8			2005	2.1	2.1	1.9	2.8
1986	1.8	1.8			2006	2.1	2.1	1.9	2.9
1987	1.9	1.9			2007	2.1	2.1	1.9	2.9
1988	1.9	1.9			2008	2.1	2.1	1.9	2.7
1989	2.0	1.9			2009	2.0	2.0	1.8	2.5
					2010	1.9	1.9	1.8	2.4

Table 10

Evidence of Net Migration of Families with Preschool Children for Shaler Area School District : 1995-99 and 2005-09

Row A	2000 Census Children < 5Yrs. of Age	2,231	2010 Census Children < 5Yrs. of Age	1,978
Row B	Births 1995-99	2,340	Births 2005-09	2,080
Row C	Net Migration (Preschoolers) Δ (A-B)	-109 (-21.8/yr.) -4.7%	Net Migration (Preschoolers) Δ (A-B)	-102 (-20.4/yr. -4.9%

Table 11

Overall Net Migration for the Shaler Area School District Using Baseline "Replacement" of Grade 12 Students in Year t-1 by Kindergarten Students in Year t: 2000-2012

	A	B	C	D	E	F
	K_t	$G12_{t-1}$	Δ_1 without migration[5]	Total Student Population$_t$	Δ_2[6]	Net Migration[7]
t= 2001-02	303	458	-155	5,586	-39	+116
2002-03	298	434	-136	5,557	-29	+107
2003-04	312	463	-151	5,594	+37	+188
2004-05	314	506	-192	5,566	-28	+164
2005-06	326	514	-188	5,482	-84	+104
2006-07	301	501	-200	5,353	-129	+71
2007-08	289	546	-257	5,156	-197	+60
2008-09	313	451	-138	5,071	-85	+53
2009-10	378	473	-95	4,977	-94	+1
2010-11	333	457	-124	4,933	-44	+80
2011-12	327	440	-113	4,768	-165	-52
2012-13	333	480	-147	4,658	-110	+37
2013-14	360	374	-14	4,630	-28	-14
Last 10 years: ∑ 2004-2013			-1,468 (-975)[1]		-964 (-523)	+504 (+452)
Last 5 years: ∑ 2009-2013			-493		-441	+52

[5] $\Delta_1 = K_t - G12_{t-1}$, i.e., assuming the counterfactual case of "what if" no one migrated; rather there was only G12 students exiting via graduation and K students entering. ***Thus the "net migration" pertains to year t-1.***

[6] Δ_2=Student Population$_t$ – Student Population$_{t-1}$; in 2000 the total student population was 5,625. Total student enrollment includes Special Ed in the grade counts.

[7] Net migration is (Δ_2-Δ_1) where Δ_2 is the change in actual or observed total students and Δ_1 is the counterfactual "what if" case depicting would happen to the total student population with no migration—in or out. Thus, the difference (Δ_2 - Δ_1) is net migration.

[1] Numbers in parentheses pertain to the 5-year period before the last 5 years.

Table 11A

Summary of "Entry-Exit Exchanges" by Year And Level: 2000-2012[9]

Year	Primary School	Elementary School	Middle School	High School	Overall
2000-01	-80	-79	-11	+15	-155
2001-02	-74	-47	-29	+14	-136
2002-03	-88	-31	-59	+27	-151
2003-04	-38	-80	-1	-73	-192
2004-05	-18	-78	-41	-51	-188
2005-06	-50	-114	+12	-48	-200
2006-07	-74	-9	-64	-110	-257
2007-08	-49	-26	-93	+30	-138
2008-09	+21	-1	-14	-101	-95
2009-10	+2	-44	-9	-73	-124
2010-11	-3	-28	-6	-76	-113
2011-12	+19	-53	-23	-90	-147
2012-13	-23	+30	-6	-15	-14
Σ1 2008-2012	+16	-96	-58	-355	-493
Σ2 2003-2007	-229	-307	-187	-252	-975
Σ4 2003-2012	-213	-403	-245	-607	-1,468
Avg/Yr					
Σ1 2008-2012	+3.2	-19.2	-11.2	-71.0	-98.6
Σ2 2003-2007	-45.8	-61.4	-37.4	-50.4	-195.0
Σ3 2000-2002	-80.7	-52.3	-33.0	+18.7	-147.3

[9] Using current grade configurations per level for consistency

Table 11B

Summary of "Entry-Exit Exchanges" by Year And Level: 2000-2012[10]

Year	Primary School	Elementary School	Middle School	High School	Overall
2000-01	-80	-79	-11	+15	-155
2001-02	-74	-47	-29	+14	-136
2002-03	-88	-31	-59	+27	-151
2003-04	-38	-80	-1	-73	-192
2004-05	-18	-78	-41	-51	-188
2005-06	-50	-114	+12	-48	-200
2006-07	-74	-9	-64	-110	-257
2007-08	-49	-26	-93	+30	-138
2008-09	+21	-1	-14	-101	-95
2009-10	+2	-44	-9	-73	-124
2010-11	-3	-28	-6	-76	-113
2011-12	+19	-53	-23	-90	-147
2012-13	-23	+30	-6	-15	-14
Σ2008-2012	+16	-96	-58	-355	-493
Σ2003-2007	-229	-307	-187	-252	-975
Σ2003-2012	-213	-403	-245	-607	-1,468
Avg/Yr					
Σ2008-2012	+3.2	-19.2	-11.2	-71.0	-98.6
Σ2003-2007	-45.8	-61.4	-37.4	-50.4	-195.0
Σ2000-2002	-80.7	-52.3	-33.0	+18.7	-147.3

[10] Using current grade configurations per level for consistency

Table 11C

Summary of "Net Migration" by Year And Level: 2000-2012[11]

Year	Primary School	Elementary School	Middle School	High School	Overall
2000-01	+31	+35	+25	+25	+116
2001-02	+32	+48	+12	+15	+107
2002-03	+50	+53	+26	+59	+188
2003-04	+55	+44	+30	+35	+164
2004-05	+44	+37	+19	+4	+104
2005-06	+39	+32	+2	-2	+71
2006-07	+23	+26	+18	-7	+60
2007-08	+27	+1	-7	+32	+53
2008-09	+4	-10	+8	-1	+1
2009-10	+21	+40	+16	+3	+80
2010-11	-15	-7	-1	-29	-52
2011-12	+17	+3	+10	+7	+37
2012-13	-14	+3	-6	+3	-14
Σ2008-2012	+13	+29	+27	-17	+52
Σ2003-2007	+188	+140	+62	+62	+452
Σ2003-2012	+201	+169	+89	+45	+504
Avg/Yr[12]					
Σ2008-2012	+2.6 (0.7)	+5.8 (1.9)	+5.4 (2.7)	-3.4 (-0.9)	+10.4 (0.8)
Σ2003-2007	+37.6 (9.4)	+28.0 (9.3)	+12.4 (6.2)	+12.4 (3.1)	+90.4 (7.0)
Σ2000-2002	+37.7 (9.4)	+45.3 (15.1)	+21.0 (10.5)	+33.0 (8.2)	+137.0 (10.5)

[11] Using current grade configurations per level for consistency

[12] Numbers in parentheses are the ave./year per grade (ie controlling for different number of grades per level)

Table 12

Shaler Area School District
Retention Ratios 2005-2012[13]
Four-Year Averages

	2005-2008	2009-2012
K→G1	1.056	.991
G1→G2	1.005	.997
G2→G3	1.012	1.019
G3→G4	1.002	1.020
G4→G5	1.020	.996
G5→G6	1.012	1.012
G6→G7	1.003	1.015
G7→G8	1.010	.998
G8→G9	1.068	1.055
G9→G10	.987	.980
G10→G11	.977	.978
G11→G12	.986	.983
$[(.33)\ B_{t-6} + (.67)\ B_{t-5}] \rightarrow K_t$[2]	.805	.841
	K: 2006-2009	K: 2010-13
	B_{t-5}: 2001-2004	B_{t-5}: 2005-2008
	B_{t-6}: 2000-2003	B_{t-6}: 2004-2007

[13] § Data for the retention ratios for 2009-2012 included student populations for 2009-2013, the beginning of school year enrollment and data for the retention ratios for 2005-2008 included student populations for 2005-2009—the beginning of school year enrollment..

[2] Four year weighted averages for Births at t-5 and t-6 Kindergarten enrollment at t; e.g., the 2009-2012 header for B→K here refers to K in 2010-2013 and births from 2004—2008, with the weights of .67 for t-5 and .33 for t-6, corresponding to the Aug. 31-age 5 requirement for K enrollment

Table 13

Cyber Charter School Enrollment for Students in the Shaler Area School District by Educational Level and Overall: 2010-2013

	K-G3	G4-G6	G7-G8	G9-G12	Total
2010-2011	16	11	22	31	80
2011-2012	15	17	16	41	89
2012-2013	16	13	16	35	80
2013-2014	9	19	18	43	89
					Range 80-89
Annual ave.	14.0	15.0	18.0	37.5	84.5

Table 14

Home School "Enrollment" of Students Who Reside in the Shaler Area School District by Educational Level and Overall: 2002-2013

	K-G3	G4-G6	G7-G8	G9-G12	Total
2000-2001	3	8	3	6	20
2001-2002	2	14	8	4	28
2002-2003	2	17	5	4	28
2003-2004	5	20	4	4	32
2004-2005	8	12	3	2	26
2005-2006	3	5	7	10	25
2006-2007	NA	NA	NA	NA	NA
2007-2008	NA	NA	NA	NA	NA
2008-2009	5	2	6	10	23
2009-2010	7	6	4	9	26
2010-2011	4	6	6	8	24
2011-2012	6	10	3	12	31
2012-2013	6	9	7	7	29
2013-2014	6	8	9	6	29
					Range 12-22
4-year averages					
2000-03	3.0	14.8	4.8	4.5	27.0
'04-'05/'08-'09	5.8	6.3	5.3	7.8	25.0
2010-2013	5.5	8.3	6.3	8.3	28.2

Table 15

Students Who Reside in the Shaler Area School District and Attend Parochial/Private Schools by Educational Level and Overall: 2000-2007

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2007-08
K-G3	540	395	214	47	17	13	16
G4-G6	319	327	308	132	137	88	45
G7-G8	218	198	179	84	61	85	98
G9-G12	185	234	194	138	190	184	167
Overall Total	1,262	1,154	895	401	405	370	326
Δ		-108	-259	-494	+4	-35	-44
%Δ		-9%	-22%	-55%	+1%	-8%	-11%

Table 16

Housing Permits by Year in Shaler Area School District: 1996-2012[14]

Year	Single Family Dwellings (SFDs)	Multi-Family Units	Total
1996	51 (49)	5 (5)	***56 (54)***
1997	23 (23)	59 (0)	***82 (23)***
1998	31 (29)	0[15] (0)	**31 (29)**
1999	42 (40)	13 (8)	***55 (48)***
2000	68 (68)	16 (16)	***84 (84)***
2001	53 (49)	16 (16)	***69 (65)***
2002	53 (49)	0	***53 (49)***
2003	69 (67)	7 (7)	***76 (74)***
2004	18 (18)	0	18 (18)
2005	33 (32)	0	33 (32)
2006	49 (49)	0	49 (49)
2007	16 (16)	0	16 (16)
2008	14 (13)	0	14 (13)
2009	2 (2)	9	11 (11)
2010	5 (5)	0	5 (5)
2011	8 (8)	6 (6)	14)14)
2012	0	0	0
	Number	4-year Averages	
1996-99	147 36.8	77 19.3	224 56.0
2000-03	243 60.8	39 9.8	282 70.5
2004-07	116 29.0	0 0	116 29.0
2008-11	29 7.3	15 3.8	44 11.0
2012	0 0	0 0	0 0

[14] Numbers in parentheses are for permits in Shaler Township only.

[15] A 59 unit apartment building in 1998 was an estimated number by the US Census and was clearly based on the 59 unit apartment building actually reported by Millvale Borough in 1997. Thus, the 1998 number is questionable and we have not included it in this table.

Table 17

Shaler Area School District Forecasts per Grade: 2014-2023 Fertility/Aging/Embedded Growth Scenario [Scenario I]·

	K	G1	G2	G3	Total K→G3	G4	G5	G6	Total G4→G6	G7	G8	Total G7→G8	G9	G10	G11	G12	Total G9 → G12	Total K → G12
2013	360	328	323	324	1,335	390	299	338	1,027	347	377	724	381	399	373	391	1,544	4,630
2014	357	357	327	329	1,370	330	388	303	1,021	343	346	689	398	373	390	367	1,528	4,608
2015	353	354	356	333	1,396	336	329	393	1,058	308	342	650	365	390	365	383	1,503	4,607
2016	374	350	353	363	1,440	340	335	333	1,008	399	307	706	361	358	381	359	1,459	4,613
2017	362	371	349	360	1,442	370	339	339	1,048	338	398	736	324	354	350	375	1,403	4,629
2018	362	359	370	356	1,447	367	369	343	1,079	344	337	681	420	318	346	344	1,428	4,635
2019	362	359	358	377	1,456	363	366	373	1,102	348	343	691	356	412	311	340	1,419	4,668
2020	362	359	358	365	1,444	385	362	370	1,117	379	347	726	362	349	403	306	1,420	4,707
2021	362	359	358	365	1,444	372	383	366	1,121	376	378	754	366	355	341	396	1,458	4,777
2022	362	359	358	365	1,444	372	371	388	1,131	371	375	746	399	359	347	335	1,440	4,761
2023	362	359	358	365	1,444	372	371	375	1,118	394	370	764	396	391	351	341	1,479	4,805

	2013	2018	2023	Δ2018-2013	Δ2023-2018	Δ2023-2013
K→G3	1,335	1,447	1,444	+112 (+8%)	-3 (0%)	+109 (+8%)
G4→G6	1,027	1,079	1,118	+52 (+5%)	+39 (+4%)	+91 (+9%)
G7→G8	724	681	764	-43 (-6%)	+83 (+12%)	+40 (+6%)
G9→G12	1,544	1,428	1,479	-116 (-8%)	+51 (+4%)	-65 (-4%)
Total	4,630	4,635	4,805	+5 (0%)	+170 (+4%)	+175 (+4%)

· This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12. (2) a Birth at t-5/t-6 to K enrollment ratio of .841; this is derived as follows: (a) a baseline birth to K enrollment ratio was estimated using the four most recent years of K enrollment (2010-2013) and the births from 2004-2008. See footnote to Table 12. For years 2014-2016, observed births in the Shaler Area School District were used. For years 2017-2023, the average number of births from 2010-2011 was used (431). See Table 1.

Table 18

Shaler Area School District Forecasts per Grade: 2014-2023 Fertility/Aging/Embedded Growth Scenario—Lower Fertility [Scenario II]·

	K	G1	G2	G3	Total K→G3	G4	G5	G6	Total G4→G6	G7	G8	Total G7→G8	G9	G10	G11	G12	Total G9 → G12	Total K → G12
2013	360	328	323	324	1,335	390	299	338	1,027	347	377	724	381	399	373	391	1,544	4,630
2014	357	357	327	329	1,370	330	388	303	1,021	343	346	689	398	373	390	367	1,528	4,608
2015	353	354	356	333	1,396	336	329	393	1,058	308	342	650	365	390	365	383	1,503	4,607
2016	374	350	353	363	1,440	340	335	333	1,008	399	307	706	361	358	381	359	1,459	4,613
2017	348	371	349	360	1,428	370	339	339	1,048	338	398	736	324	354	350	375	1,403	4,615
2018	348	345	370	356	1,419	367	369	343	1,079	344	337	681	420	318	346	344	1,428	4,607
2019	348	345	344	377	1,414	363	366	373	1,102	348	343	691	356	412	311	340	1,419	4,626
2020	348	345	344	351	1,388	385	362	370	1,117	379	347	726	362	349	403	306	1,420	4,651
2021	348	345	344	351	1,388	358	383	366	1,107	376	378	754	366	355	341	396	1,458	4,707
2022	348	345	344	351	1,388	358	357	388	1,103	371	375	746	399	359	347	335	1,440	4,677
2023	348	345	344	351	1,388	358	357	361	1,076	394	370	764	396	391	351	341	1,479	4,707

	2013	2018	2023	Δ2018-2013	Δ2023-2018	Δ2023-2013
K→G3	1,335	1,419	1,388	+84 (+6%)	-31 (-2%)	+53 (+4%)
G4→G6	1,027	1,079	1,076	+52 (+5%)	-3 (0%)	+49 (+5%)
G7→G8	724	681	764	-43 (-6%)	+83 (+12%)	+40 (+6%)
G9→G12	1,544	1,428	1,479	-116 (-8%)	+51 (+4%)	-65 (-4%)
Total	4,630	4,607	4,707	-23 (0%)	+100 (+2%)	+77 (+2%)

· This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12. (2) a Birth at t-5/t-6 to K enrollment ratio of .841; this is derived as follows: (a) a baseline birth to K enrollment ratio was estimated using the four most recent years of K enrollment (2010-2013) and the births from 2004-2008. See footnote to Table 12. For years 2014-2016, observed births in the Shaler Area School District were used. For years 2017-2023, the average number of births from 2000-2009 was used (414). See Table 1.

TABLE 18A

Age Structural Change Process Across Time by Major Type of Population Cohort and Five-Year Increments in Time – 1990-2020

Type of Cohort[+]	1990	1995	2000	2005	2010	2015	2020
EB_3	<10	<10	<10	10-14	15-19	20-24	25-29
EB_2	<10	<10	10-14	15-19	20-24	25-29	30-34
EB_1	<10	10-14	15-19	20-24	25-29	30-34	35-39
bb_2	10-14	15-19	20-24	25-29	30-34	35-39	40-44
bb_1	15-19	20-24	25-29	30-34	35-39	40-44	45+
TC	20-24	25-29	30-34	35-39	40-44	45+	45+
BB_4	25-29	30-34	35-39	40-44	45+	45+	45+
BB_3	30-34	35-39	40-44	45+	45+	45+	45+
BB_2	35-39	40-44	45+	45+	45+	45+	45+
BB_1	40-44	45+	45+	45+	45+	45+	45+

[+] EB: Echol Boom, bb: baby bust, TC: Transition cohort between the baby boom and baby bust cohorts; BB: Baby Boom.
Also note that $BB_4 > TC > bb_1 > bb_2$.

Table 19

Shaler Area School District Forecasts per Grade: Fertility/Aging/Embedded Growth Scenario—Continued Increase in Births: 2014-2023 [Scenario III]·

	K	G1	G2	G3	Total K→G3	G4	G5	G6	Total G4→G6	G7	G8	Total G7→G8	G9	G10	G11	G12	Total G9 → G12	Total K → G12
2013	360	328	323	324	1,335	390	299	338	1,027	347	377	724	381	399	373	391	1,544	4,630
2014	357	357	327	329	1,370	330	388	303	1,021	343	346	689	398	373	390	367	1,528	4,608
2015	353	354	356	333	1,396	336	329	393	1,058	308	342	650	365	390	365	383	1,503	4,607
2016	374	350	353	363	1,440	340	335	333	1,008	399	307	706	361	358	381	359	1,459	4,613
2017	362	371	349	360	1,442	370	339	339	1,048	338	398	736	324	354	350	375	1,403	4,629
2018	362	359	370	356	1,447	367	369	343	1,079	344	337	681	420	318	346	344	1,428	4,635
2019	381	359	358	377	1,475	363	366	373	1,102	348	343	691	356	412	311	340	1,419	4,687
2020	381	378	358	365	1,482	385	362	370	1,117	379	347	726	362	349	403	306	1,420	4,745
2021	381	378	377	365	1,501	372	383	366	1,121	376	378	754	366	355	341	396	1,458	4,834
2022	381	378	377	384	1,520	372	371	388	1,131	371	375	746	399	359	347	335	1,440	4,837
2023	381	378	377	384	1,520	392	371	398	1,161	394	370	764	396	391	351	341	1,479	4,924

	2013	2018	2023	Δ2018-2013	Δ2023-2018	Δ2023-2013
K→G3	1,335	1,447	1,520	+112 (+8%)	+73 (+5%)	+185 (+14%)
G4→G6	1,027	1,079	1,161	+52 (+5%)	+82 (+8%)	+134 (+13%)
G7→G8	724	681	764	-43 (-6%)	+83 (+12%)	+40 (+ 6%)
G9→G12	1,544	1,428	1,479	-116 (-8%)	+51 (+4%)	-65 (-4%)
Total	4,630	4,635	4,924	+5 (0%)	+289 (+6%)	+294 (+6%)

· This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12. (2) a Birth at t-5/t-6 to K enrollment ratio of .841; this is derived as follows: (a) a baseline birth to K enrollment ratio was estimated using the four most recent years of K enrollment (2010-2013) and the births from 2004-2008. See footnote to Table 12. For years 2014-2016, observed births in the Shaler Area School District were used. For years 2017 and 2018, the average number of births from 2008-2010 was used (431), as in Scenario I, while for the last 5 years, we expect another increase the same magnitude as from 2005-09 to 2010-11 (+22) and hence the births from 2019 to 2023 are 453 - 431 +22 = 453 per year. For the observed number of births per year, see Table 1. For more specifics on the basis for such an increase, see text.

Table 20A

Birchfield Primary School Forecasts per Grade: Fertility/Aging/ Embedded Growth Scenario: 2014-2023 [Scenario IVa]*

	K	G1	G2	G3	Total K→G3
2013	97	96	108	76	377
2014	97	96	96	110	399
2015	97	96	96	98	387
2016	109	96	96	98	399
2017	101	108	96	98	403
2018	101	100	108	98	407
2019	101	100	100	110	411
2020	101	100	100	102	403
2021	101	100	100	102	403
2022	101	100	100	102	403
2023	101	100	100	102	403

	Δ2013-2018	Δ2023-2018	Δ2023-2013	ΔPeak	Peak Size
Overall	+30	-4	+26	+34	411

* This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12 and (2) a Birth at t-5/t-6 to K enrollment ratio of .841. For years 2014-2016, the observed births from 2008-2011 at the census tract level in the Shaler Area School District were used, with a percentage share of census tracts per Primary School as shown in the text. For years 2017-2023, we use the most recent 4- year average of total births, as in Scenario I. Then an estimate was made of the percentage distribution of these births per census tract and finally a share of the census tracts among the five Primary Schools was used to estimate births per year per Primary School attendance area. For Birchfield the expected average number of births per year from 2017-2023 is 120 and the expected K enrollment for these years is 101 students (120 x .841 = 101).

Table 20B

Jeffery Primary School Forecasts per Grade: Fertility/Aging/ Embedded Growth Scenario: 2014-2023 [Scenario IVb]*

	K	G1	G2	G3	Total K→G3
2013	50	44	58	51	203
2014	50	50	44	59	203
2015	50	50	50	45	195
2016	52	50	50	51	203
2017	51	52	50	51	204
2018	51	51	52	51	205
2019	51	51	51	53	206
2020	51	51	51	52	205
2021	51	51	51	52	205
2022	51	51	51	52	205
2023	51	51	51	52	205

	Δ2013-2018	Δ2023-2018	Δ2023-2013	ΔPeak	Peak Size
Overall	+2	0	+2	+3	206

* This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12 and (2) a Birth at t-5/t-6 to K enrollment ratio of .841. For years 2014-2016, the observed births from 2008-2011 at the census tract level in the Shaler Area School District were used, with a percentage share of census tracts per Primary School as shown in the text. For years 2017-2023, we use the most recent 4- year average of total births, as in Scenario I. Then an estimate was made of the percentage distribution of these births per census tract and finally a share of the census tracts among the five Primary Schools was used to estimate births per year per Primary School attendance area. For the Jeffery Primary School the expected average number of births per year from 2017-2023 is 61 and the expected K enrollment for these years is 51 students (61 x .841 = 51).

Table 20C

Marzolf Primary School Forecasts per Grade: Fertility/Aging/ Embedded Growth Scenario: 2014-2023 [Scenario IVc]*

	K	G1	G2	G3	Total K→G3
2013	94	81	79	89	343
2014	94	93	81	81	349
2015	98	93	93	83	367
2016	93	97	93	95	378
2017	94	92	97	95	378
2018	94	93	92	99	378
2019	94	93	93	94	374
2020	94	93	93	95	375
2021	94	93	93	95	375
2022	94	93	93	95	375
2023	94	93	93	95	375

	Δ2013-2018	Δ2023-2018	Δ2023-2013	ΔPeak	Peak Size
Overall	+35	-3	+32	+35	378

* This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12 and (2) a Birth at t-5/t-6 to K enrollment ratio of .841. For years 2014-2016, the observed births from 2008-2011 at the census tract level in the Shaler Area School District were used, with a percentage share of census tracts per Primary School as shown in the text. For years 2017-2023, we use the most recent 4- year average of total births, as in Scenario I. Then an estimate was made of the percentage distribution of these births per census tract and finally a share of the census tracts among the five Primary Schools was used to estimate births per year per Primary School attendance area. For Marzolf the expected average number of births per year from 2017-2023 is 112 and the expected K enrollment for these years is 94 students (112 x .841 = 94).

Table 20D

Reserve Primary School Forecasts per Grade: Fertility/Aging/ Embedded Growth Scenario: 2014-2023 [Scenario IVd]*

	K	G1	G2	G3	Total K→G3
2013	59	56	38	60	213
2014	55	58	56	39	208
2015	51	55	58	57	221
2016	57	51	55	59	222
2017	56	56	51	56	219
2018	56	55	56	52	219
2019	56	55	55	57	223
2020	56	55	55	56	222
2021	56	55	55	56	222
2022	56	55	55	56	222
2023	56	55	55	56	222

	Δ2013-2018	Δ2023-2018	Δ2023-2013	ΔPeak	Peak Size
Overall	+6	+3	+9	+10	223

* This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12 and (2) a Birth at t-5/t-6 to K enrollment ratio of .841. For years 2014-2016, the observed births from 2008-2011 at the census tract level in the Shaler Area School District were used, with a percentage share of census tracts per Primary School as shown in the text. For years 2017-2023, we use the most recent 4- year average of total births, as in Scenario I. Then an estimate was made of the percentage distribution of these births per census tract and finally a share of the census tracts among the five Primary Schools was used to estimate births per year per Primary School attendance area. For the Reserve Primary School the expected average number of births per year from 2017-2023 is 67 and the expected K enrollment for these years is 56 students (67 x .841 = 56).

Table 20E

Rogers Primary School Forecasts per Grade: Fertility/Aging/ Embedded Growth Scenario: 2014-2023 [Scenario IVe]*

	K	G1	G2	G3	Total K→G3
2013	60	51	40	48	199
2014	63	59	51	41	214
2015	59	62	59	52	232
2016	62	58	62	60	242
2017	61	61	58	63	243
2018	61	60	61	59	241
2019	61	60	60	62	243
2020	61	60	60	61	242
2021	61	60	60	61	242
2022	61	60	60	61	242
2023	61	60	60	61	242

	Δ2013-2018	Δ2023-2018	Δ2023-2013	ΔPeak	Peak Size
Overall	+42	+1	+43	+44	243

* This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12 and (2) a Birth at t-5/t-6 to K enrollment ratio of .841. For years 2014-2016, the observed births from 2008-2011 at the census tract level in the Shaler Area School District were used, with a percentage share of census tracts per Primary School as shown in the text. For years 2017-2023, we use the most recent 4- year average of total births, as in Scenario I. Then an estimate was made of the percentage distribution of these births per census tract and finally a share of the census tracts among the five Primary Schools was used to estimate births per year per Primary School attendance area. For the Rogers Primary School the expected average number of births per year from 2017-2023 is 73 and the K expected enrollment for these years is 61 students (73 x .841 = 61).

Table 21A

Birchfield Primary School Forecasts per Grade: Fertility/Aging/ Embedded Growth Scenario— Continued Increase in Births: 2014-2023 [Scenario Va]*

	K	G1	G2	G3	Total K→G3
2013	97	96	108	76	377
2014	97	96	96	110	399
2015	97	96	96	98	387
2016	109	96	96	98	399
2017	101	108	96	98	403
2018	101	100	108	98	407
2019	108	100	100	110	418
2020	108	107	100	102	424
2021	108	107	107	102	424
2022	108	107	107	109	431
2023	108	107	107	109	431

	Δ2013-2018	Δ2023-2018	Δ2023-2013	ΔPeak	Peak Size
Overall	+30	+24	+54	+54	431

* This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12 and (2) a Birth at t-5/t-6 to K enrollment ratio of .841. For years 2014-2016, the observed births from 2008-2011 at the census tract level in the Shaler Area School District were used, with a percentage share of census tracts per Primary School as shown in the text. For years 2017-2023, we use the most recent 4- year average of total births, as in Scenario I. Then an estimate was made of the percentage distribution of these births per census tract and finally a share of the census tracts among the five Primary Schools was used to estimate births per year per Primary School attendance area. For Birchfield the expected average number of births per year from 2017-2018 is 120 and the expected K enrollment for these years is 101 students (120 x .841 = 101); additionally, the average number of births from 2019-2023 is 128 and the expected K enrollment for these years is 108 students (128 x .841 = 108).

Table 21B

Jeffery Primary School Forecasts per Grade: Fertility/Aging/ Embedded Growth Scenario-- Continued Increase in Births: 2014-2023 [Scenario Vb]*

	K	G1	G2	G3	Total K→G3
2013	50	44	58	51	203
2014	50	50	44	59	203
2015	50	50	50	45	195
2016	52	50	50	51	203
2017	51	52	50	51	204
2018	51	51	52	51	205
2019	54	51	51	53	209
2020	54	54	51	52	211
2021	54	54	54	52	214
2022	54	54	54	55	217
2023	54	54	54	55	217

	Δ2013-2018	Δ2023-2018	Δ2023-2013	ΔPeak	Peak Size
Overall	+2	+12	+14	+14	217

* This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12 and (2) a Birth at t-5/t-6 to K enrollment ratio of .841. For years 2014-2016, the observed births from 2008-2011 at the census tract level in the Shaler Area School District were used, with a percentage share of census tracts per Primary School as shown in the text. For years 2017-2023, we use the most recent 4- year average of total births, as in Scenario I. Then an estimate was made of the percentage distribution of these births per census tract and finally a share of the census tracts among the five Primary Schools was used to estimate births per year per Primary School attendance area. For the Jeffery Primary School the expected average number of births per year from 2017-201 is 61 and the expected K enrollment for these years is 51 students (61 x .841 = 51) additionally, the average number of births from 2019-2023 is 64 and the expected K enrollment for these years is 54 students (64 x .841 = 54).

Table 21C

Marzolf Primary School Forecasts per Grade: Fertility/Aging/ Embedded Growth Scenario: 2014-2023 [Scenario Vc]*

	K	G1	G2	G3	Total K→G3
2013	94	81	79	89	343
2014	94	93	81	81	349
2015	98	93	93	83	367
2016	93	97	93	95	378
2017	94	92	97	95	378
2018	94	93	92	99	378
2019	99	93	93	94	379
2020	99	98	93	95	385
2021	99	98	98	95	390
2022	99	98	98	100	395
2023	99	98	98	100	395

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	Δ2013-2018	Δ2023-2018	Δ2023-2013	ΔPeak	Peak Size
Overall	+35	+17	+52	+52	395

* This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12 and (2) a Birth at t-5/t-6 to K enrollment ratio of .841. For years 2014-2016, the observed births from 2008-2011 at the census tract level in the Shaler Area School District were used, with a percentage share of census tracts per Primary School as shown in the text. For years 2017-2023, we use the most recent 4- year average of total births, as in Scenario I. Then an estimate was made of the percentage distribution of these births per census tract and finally a share of the census tracts among the five Primary Schools was used to estimate births per year per Primary School attendance area. For Marzolf the expected average number of births per year from 2017-2018 is 112 and the expected K enrollment for these years is 94 students (112 x .841 = 94); additionally, the average number of births from 2019-2023 is 118 and the expected K enrollment for these years is 99 students (118 x .841 = 99).

Table 21D

Reserve Primary School Forecasts per Grade: Fertility/Aging/ Embedded Growth Scenario: 2014-2023 [Scenario Vd]*

	K	G1	G2	G3	Total K→G3
2013	59	56	38	60	213
2014	55	58	56	39	208
2015	51	55	58	57	221
2016	57	51	55	59	222
2017	56	56	51	56	219
2018	56	55	56	52	219
2019	59	55	55	57	226
2020	59	58	55	56	231
2021	59	58	58	56	231
2022	59	58	58	59	234
2023	59	58	58	59	234

	Δ2013-2018	Δ2023-2018	Δ2023-2013	ΔPeak	Peak Size
Overall	+6	+15	21	+21	234

* This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12 and (2) a Birth at t-5/t-6 to K enrollment ratio of .841. For years 2014-2016, the observed births from 2008-2011 at the census tract level in the Shaler Area School District were used, with a percentage share of census tracts per Primary School as shown in the text. For years 2017-2023, we use the most recent 4- year average of total births, as in Scenario I. Then an estimate was made of the percentage distribution of these births per census tract and finally a share of the census tracts among the five Primary Schools was used to estimate births per year per Primary School attendance area. For the Reserve Primary School the expected average number of births per year from 2017-2018 is 67 and the expected K enrollment for these years is 56 students (67 x .841 = 56); additionally, the average number of births from 2019-2023 is 70 and the expected K enrollment for these years is 59 students (70 x .841 = 59).

Table 21E

Rogers Primary School Forecasts per Grade: Fertility/Aging/ Embedded Growth Scenario: 2014-2023 [Scenario Ve]*

	K	G1	G2	G3	Total K→G3
2013	60	51	40	48	199
2014	63	59	51	41	214
2015	59	62	59	52	232
2016	62	58	62	60	242
2017	61	61	58	63	243
2018	61	60	61	59	241
2019	64	60	60	62	246
2020	64	63	60	61	248
2021	64	63	63	61	251
2022	64	63	63	64	254
2023	64	63	63	64	254

	Δ2013-2018	Δ2023-2018	Δ2023-2013	ΔPeak	Peak Size
Overall	+42	+13	+55	+55	254

This scenario uses the following parameters: (1) Baseline four-year retention ratios (2009-2012), as shown in Table 12 and (2) a Birth at t-5/t-6 to K enrollment ratio of .841. For years 2014-2016, the observed births from 2008-2011 at the census tract level in the Shaler Area School District were used, with a percentage share of census tracts per Primary School as shown in the text. For years 2017-2023, we use the most recent 4- year average of total births, as in Scenario I. Then an estimate was made of the percentage distribution of these births per census tract and finally a share of the census tracts among the five Primary Schools was used to estimate births per year per Primary School attendance area. For the Rogers Primary School the expected average number of births per year from 2017-2018 is 73 and the K expected enrollment for these years is 61 students (73 x .841 = 61); additionally, the average number of births from 2019-2023 is 76 and the expected K enrollment for these years is 64 students (76 x .841 = 64).


Ryan Elementary School

HHSDR
Architects/Engineers