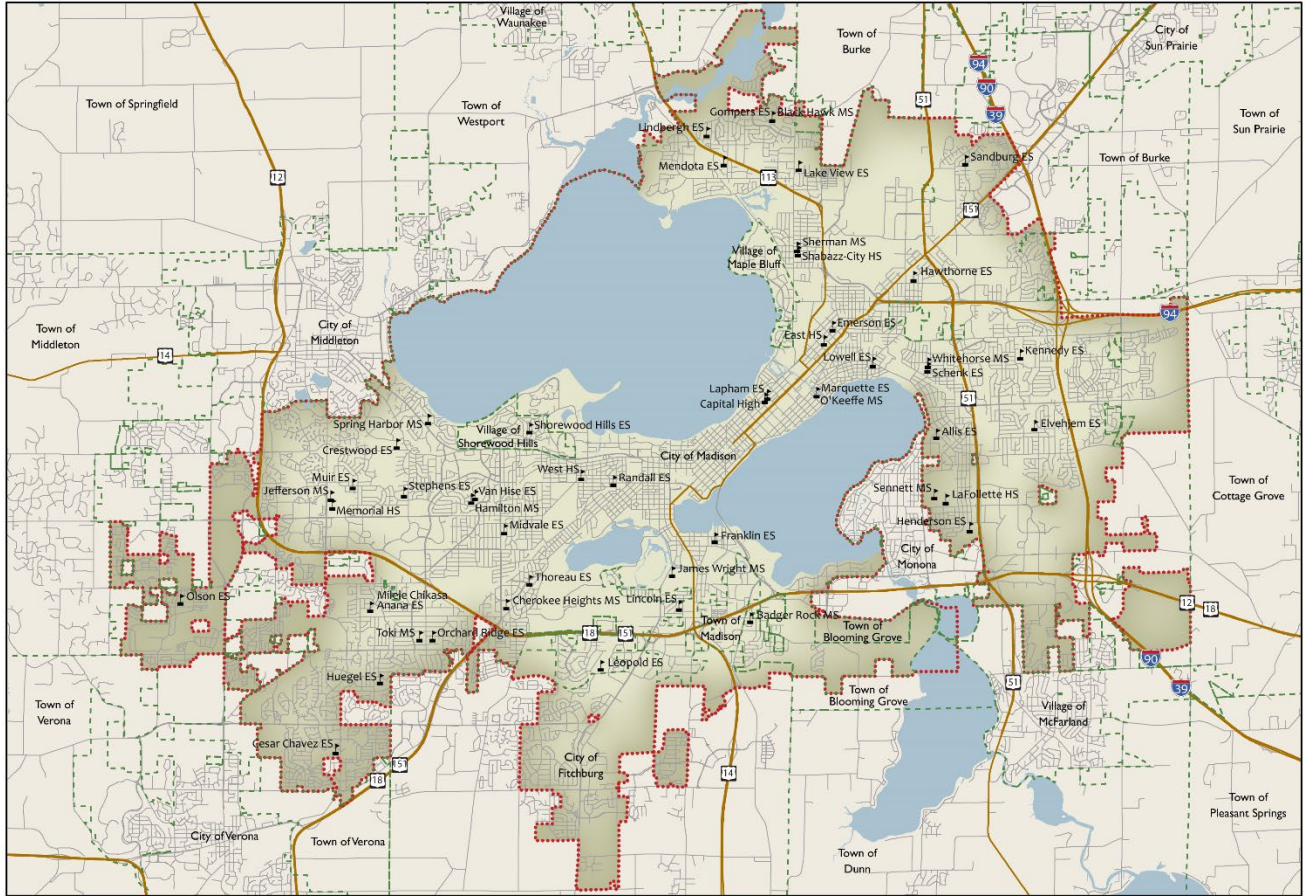


Planning for the Schools of Tomorrow



Madison Metropolitan School District

0 1 2 Miles

- Schools
- Municipalities
- School District
- Water

Prepared by the Applied Population Laboratory
 University of Wisconsin-Madison
 Department of Community & Environmental Sociology

School Enrollment Projections Series Madison Metropolitan School District

December 2022

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Executive Summary

This report provides an enrollment projections analysis for the Madison Metropolitan School District by the Applied Population Laboratory, University of Wisconsin-Madison. The district-wide 4K-12 enrollment for the current 2022/23 school year is 25,139 students. The report takes into consideration past enrollment, current and projected births, and overall trends in population and housing to determine future student growth.

- In the last five years, the district has seen a 1.7% decline in enrollment. Elementary school enrollment experienced a decline of 2.1%. Middle school enrollment has declined by 1.4% in the last five years, while high school enrollment declined the least, decreasing by 0.4%.
- Overall, long-term trends in births and kindergarten classes have been decreasing, while recent trends in births and kindergarten classes have shown more significant decline. Smaller four-year-old kindergarten and kindergarten classes will mean smaller cohorts of students progressing grade to grade and year to year.
- All three models project 4K-12 enrollment to decline, averaging a 10% decrease, in the next five years. Four-year-old kindergarten enrollment will likely decline by 11.5%. Elementary school enrollment is likely to see decreases of almost 12%, while middle school enrollment will decline by almost 8% over the next five years. High school enrollment will also decline, decreasing by nearly 9% in five years.



Introduction

Enrollment projections for Madison Metropolitan School District are presented district-wide, individually for each grade and for grade groupings. The projections process uses a combination of historical enrollment data, birth trends and projections, and general population trends to create reasonable assumptions about future scenarios and the likely impact on 3rd Friday enrollment.

District Enrollment History

Figure 1-A and Tables 1 and 2 display the last ten years of enrollment in the Madison Metropolitan School District. District 4K-12 enrollment has decreased overall in the past ten years, from 27,028 students in the 2013/14 school year to 25,139 students in 2022/23. This is a decrease of 1,889 students, or a 7% decline in the number of students attending Madison schools. Most of this decline has occurred over the last three years.

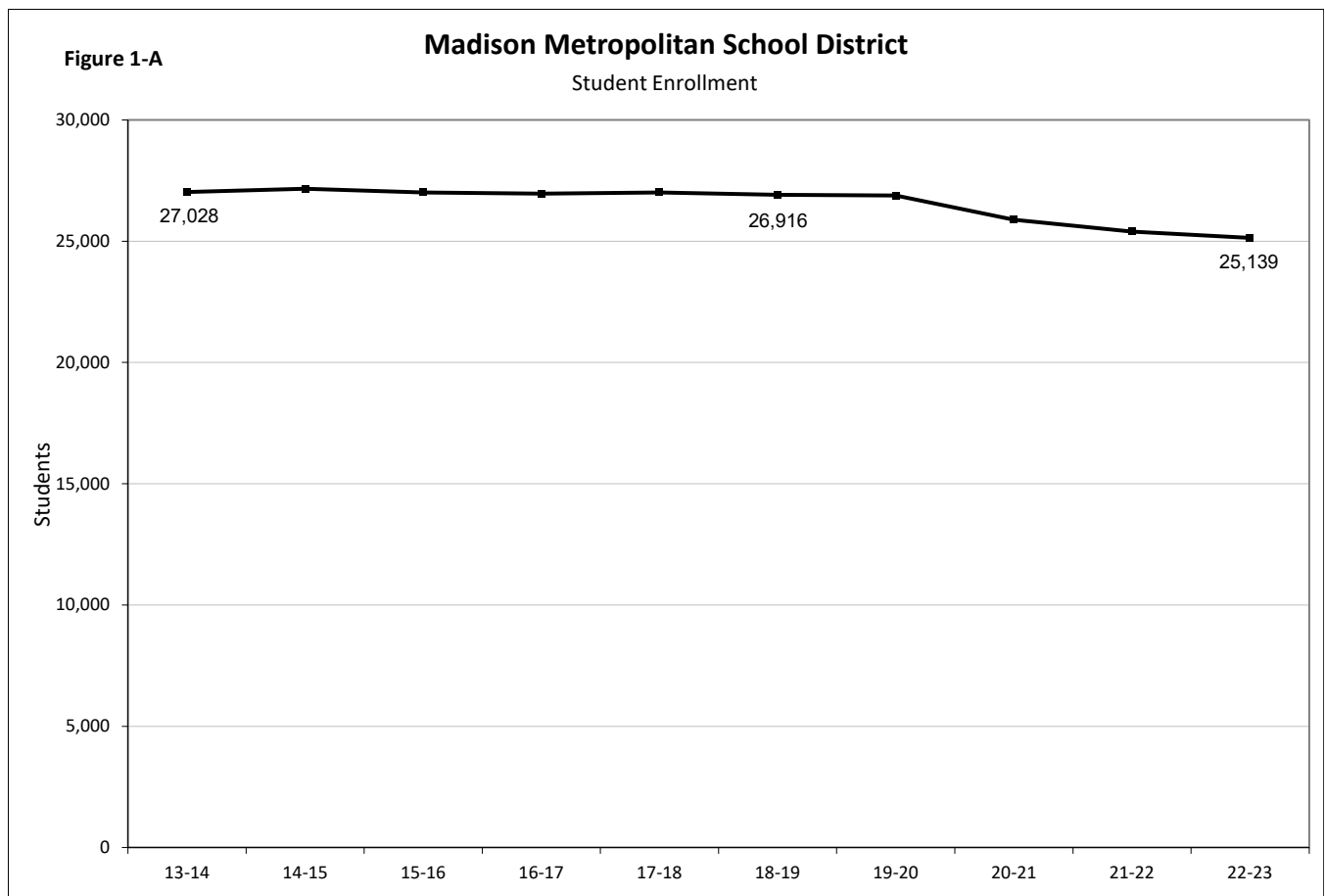


TABLE 1
Student Enrollment
Madison Metropolitan School District

	SCHOOL YEAR									
	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23
4K	1,962	1,866	1,778	1,719	1,797	1,776	1,717	1,415	1,348	1,451
K	2,271	2,258	2,127	2,074	2,028	2,063	2,090	1,877	1,832	1,781
1	2,176	2,109	2,154	2,059	2,016	1,958	1,989	1,952	1,835	1,838
2	2,079	2,135	2,073	2,114	1,967	1,944	1,930	1,854	1,883	1,821
3	2,071	2,017	2,059	2,016	2,046	1,913	1,898	1,836	1,777	1,852
4	1,990	2,011	1,951	1,991	1,963	2,006	1,906	1,825	1,729	1,760
5	1,829	1,931	1,940	1,886	1,915	1,915	1,976	1,835	1,785	1,735
6	1,789	1,782	1,882	1,868	1,799	1,888	1,860	1,858	1,723	1,661
7	1,825	1,781	1,709	1,844	1,832	1,784	1,855	1,774	1,817	1,712
8	1,719	1,809	1,753	1,718	1,828	1,807	1,771	1,823	1,726	1,803
9	1,798	1,824	1,889	1,866	1,885	1,965	1,944	1,840	1,904	1,817
10	1,741	1,820	1,854	1,908	1,868	1,872	1,965	1,918	1,834	1,877
11	1,965	1,896	1,824	1,848	1,917	1,864	1,882	1,974	1,957	1,816
12	1,813	1,927	2,016	2,048	2,150	2,161	2,100	2,102	2,246	2,215
TOTAL	27,028	27,166	27,009	26,959	27,011	26,916	26,883	25,883	25,396	25,139
K-12	25,066	25,300	25,231	25,240	25,214	25,140	25,166	24,468	24,048	23,688
K-5	12,416	12,461	12,304	12,140	11,935	11,799	11,789	11,179	10,841	10,787
6-8	5,333	5,372	5,344	5,430	5,459	5,479	5,486	5,455	5,266	5,176
9-12	7,317	7,467	7,583	7,670	7,820	7,862	7,891	7,834	7,941	7,725

TABLE 2
Student Enrollment Changes
Madison Metropolitan School District

GRADE	ABSOLUTE CHANGE			PERCENT CHANGE			AVERAGE ANNUAL PERCENT CHANGE		
	'13 to '22	'13 to '17	'18 to '22	'13 to '22	'13 to '17	'18 to '22	'13 to '22	'13 to '17	'18 to '22
4K	-511	-165	-325	-26.0	-8.4	-18.3	-2.9	-2.1	-4.6
K	-490	-243	-282	-21.6	-10.7	-13.7	-2.4	-2.7	-3.4
1	-338	-160	-120	-15.5	-7.4	-6.1	-1.7	-1.8	-1.5
2	-258	-112	-123	-12.4	-5.4	-6.3	-1.4	-1.3	-1.6
3	-219	-25	-61	-10.6	-1.2	-3.2	-1.2	-0.3	-0.8
4	-230	-27	-246	-11.6	-1.4	-12.3	-1.3	-0.3	-3.1
5	-94	86	-180	-5.1	4.7	-9.4	-0.6	1.2	-2.3
6	-128	10	-227	-7.2	0.6	-12.0	-0.8	0.1	-3.0
7	-113	7	-72	-6.2	0.4	-4.0	-0.7	0.1	-1.0
8	84	109	-4	4.9	6.3	-0.2	0.5	1.6	-0.1
9	19	87	-148	1.1	4.8	-7.5	0.1	1.2	-1.9
10	136	127	5	7.8	7.3	0.3	0.9	1.8	0.1
11	-149	-48	-48	-7.6	-2.4	-2.6	-0.8	-0.6	-0.6
12	402	337	54	22.2	18.6	2.5	2.5	4.6	0.6
TOTAL	-1,889	-17	-1,777	-7.0	-0.1	-6.6	-0.8	0.0	-1.7
K-12	-1,378	148	-1,452	-5.5	0.6	-5.8	-0.6	0.1	-1.4
K-5	-1,629	-481	-1,012	-13.1	-3.9	-8.6	-1.5	-1.0	-2.1
6-8	-157	126	-303	-2.9	2.4	-5.5	-0.3	0.6	-1.4
9-12	408	503	-137	5.6	6.9	-1.7	0.6	1.7	-0.4



Figure 1-B shows enrollment history broken down by grade groupings (4K, K-5, 6-8, and 9-12). Four-year-old kindergarten enrollment has declined 3% annually over the last ten years and elementary school enrollment has decreased by 1.5% annually. Middle school enrollment has decreased over the past ten years by 0.3% annually, while high school enrollment has increased, growing by 0.6% annually.

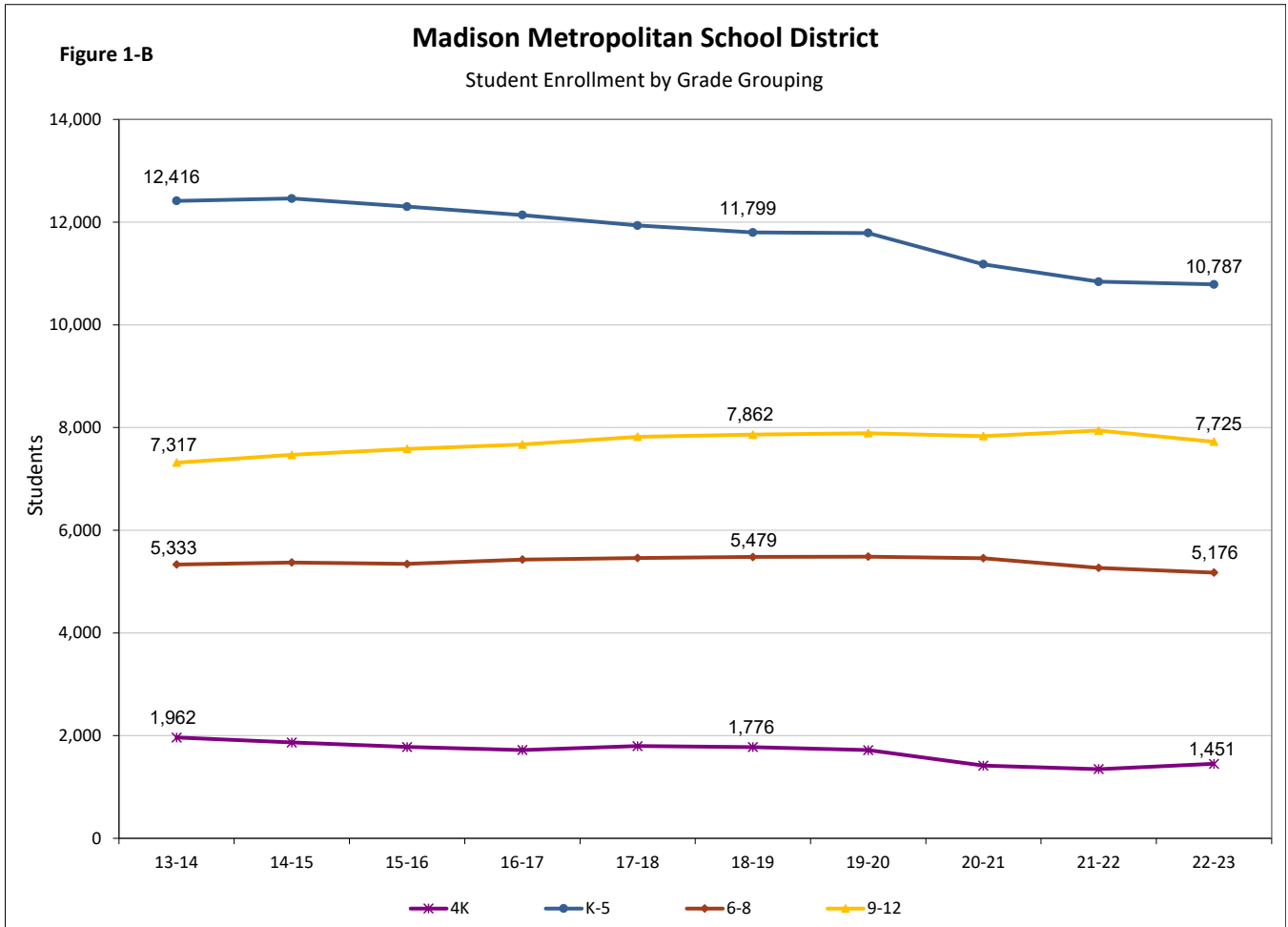
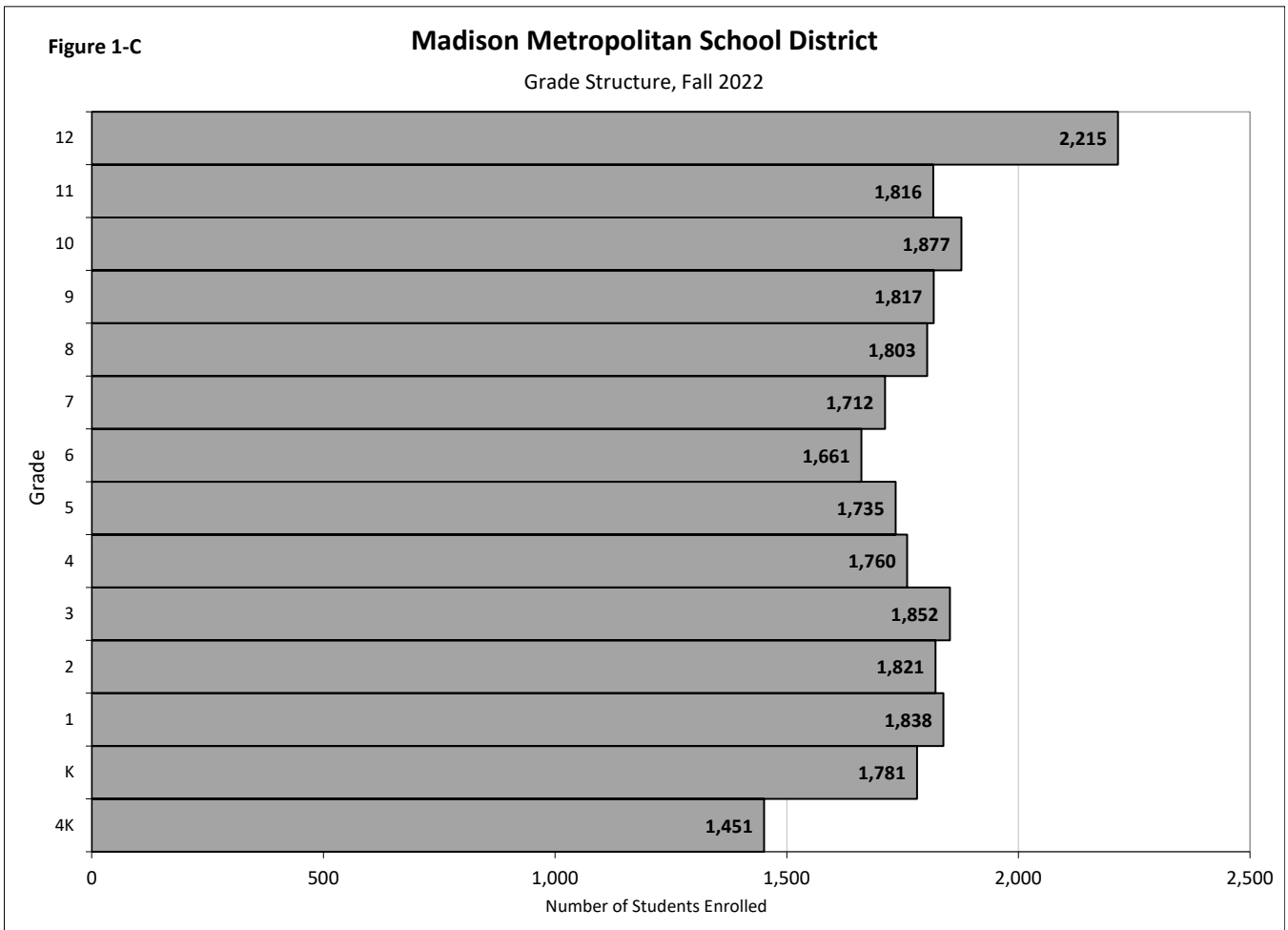
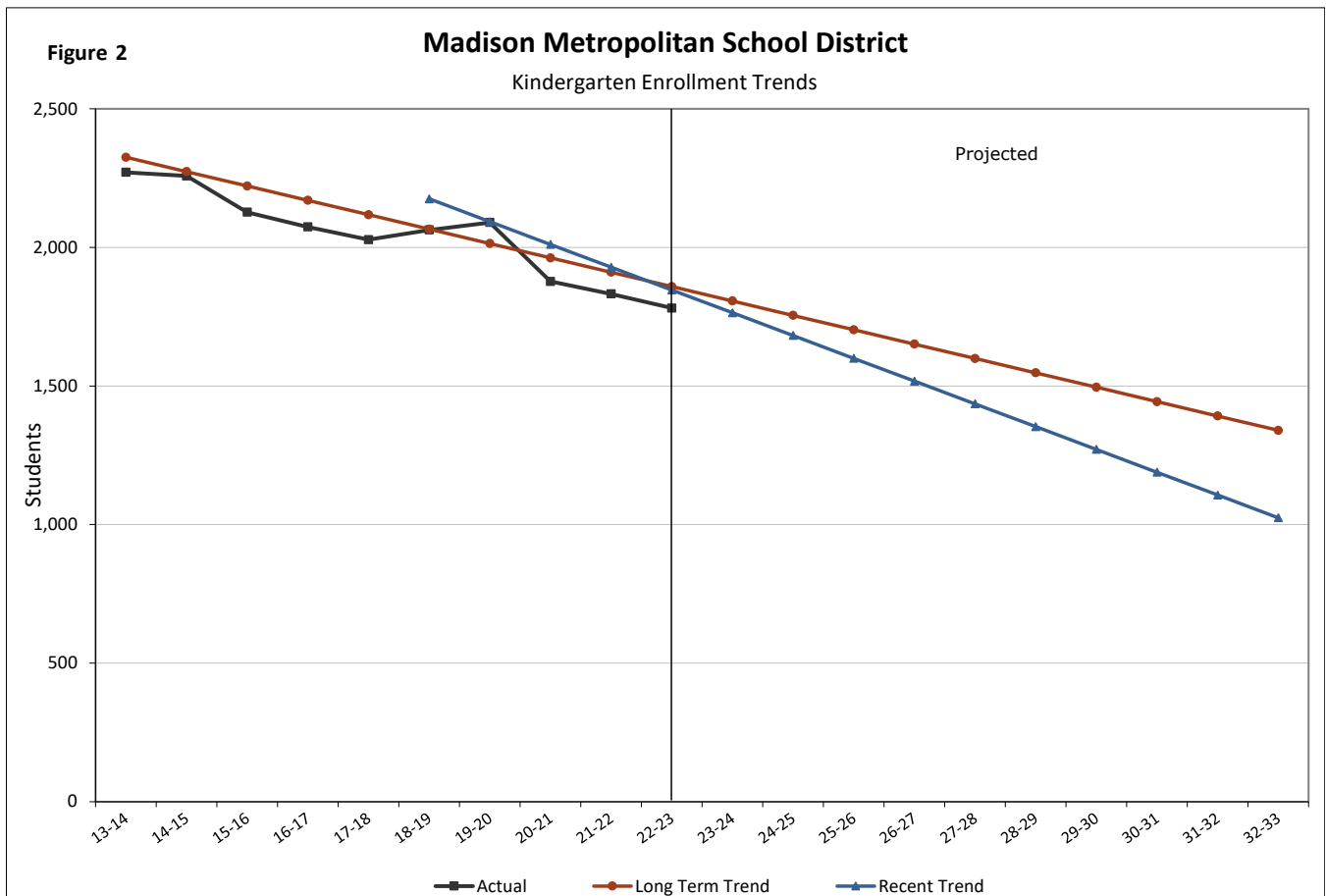


Figure 1-C shows the grade structure in Fall 2022 with the number of 4K at the bottom and the number of 12th graders at the top. The average grade size for grades 9-12 is 1,931 with 12th grade being the largest among high school grades, however 12th graders do include students returning for a second year. Grades 6-8 average grade size is smaller at 1,725 with 8th grade being largest among middle school grades. Grades K-5 average grade size is 1,798 with 3rd grade being largest among elementary school grades, although 1st grade enrollment is very close to 3rd.



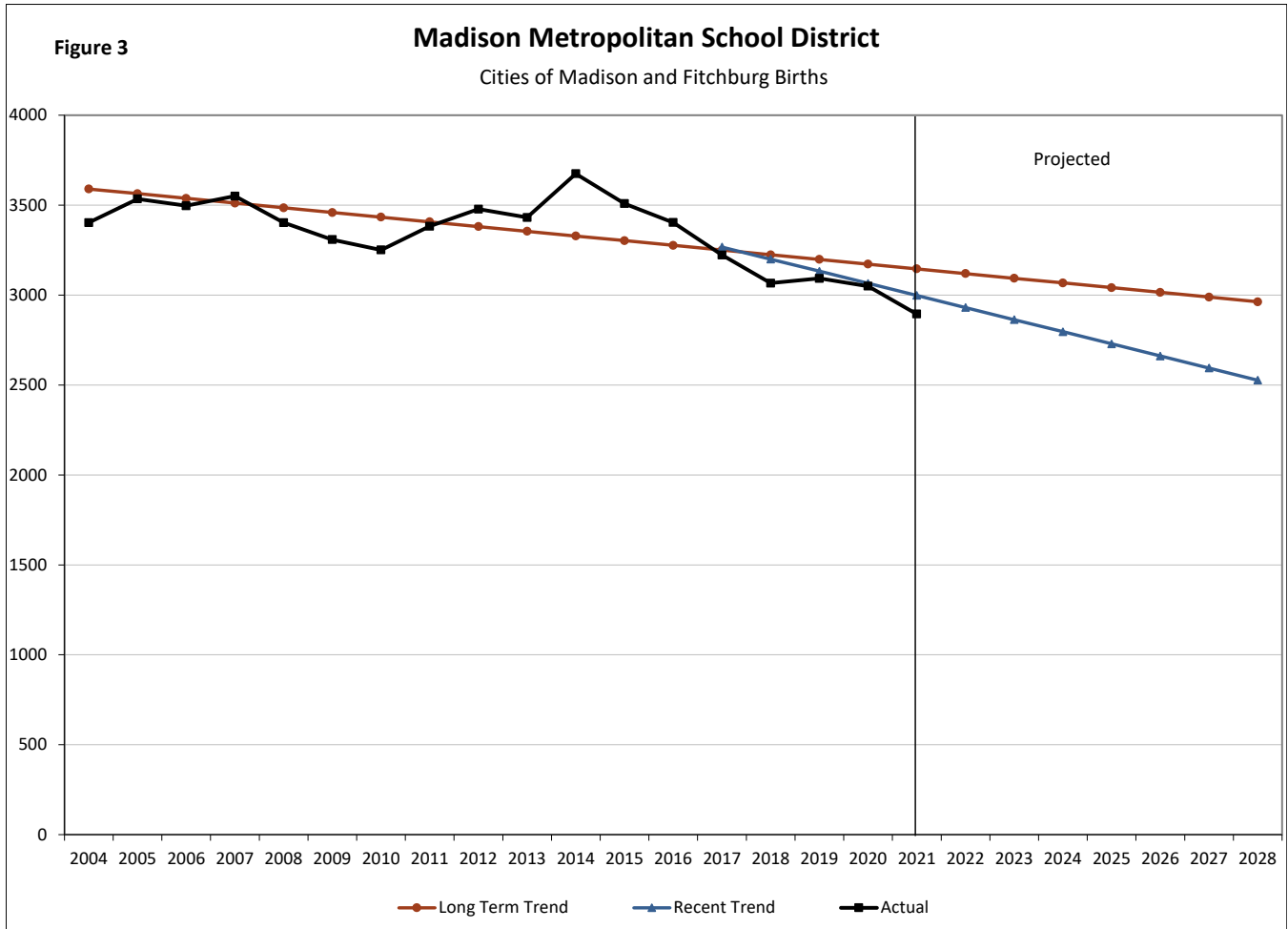
Kindergarten Enrollment Trends

Examining trends in kindergarten enrollment is particularly informative for gaining perspective on future district enrollment, as today’s kindergarteners will gradually make up tomorrow’s students at the higher grade levels as they age and move through the school system. When kindergarten enrollment is decreasing, elementary and middle school enrollment might be expected to decrease in the future, while high school enrollment may decrease farther in the future. Figure 2 shows kindergarten enrollment history in black, and trend lines depicting kindergarten enrollment in red and blue. The “Long Term Trend” line (shown in red) averages kindergarten enrollment changes between 2013/14 and 2022/23. The “Recent Trend” (shown in blue) line emphasizes kindergarten enrollment changes over the last five years. In the Madison Metropolitan School District, long-term kindergarten trends show decreasing enrollment, while recent kindergarten trends indicate a more significant decline largely due to the pandemic and the loss of kindergarten students in the district’s classrooms.



Birth Trends and Projections

We use historical and projected birth data to forecast the number of 4K and 5K students who will enroll in the Madison Metropolitan School District in future years. Birth data, as collected and summarized by the Wisconsin Department of Health Services, is available at the municipal level. Figure 3 shows the number of municipal births from the cities of Madison and Fitchburg, by year, from 2004 through 2021.



We extrapolate long- and short-range birth trends into the future to correspond with our baseline and recent trend models. Long-term birth trends indicate slightly decreasing births, while the recent trend shows a more significant decrease in births. The red line represents the birth trends over the past eighteen years and is utilized in the Baseline model. The blue line denotes birth patterns for the last five years and is applied in the Five-Year and Three-Year trend models.



Population Estimates

This section examines population trends of the recent past for the municipalities within the district. Changes in the total population of the district area, particularly when examined by age, provide clues into how the school-age population may be changing.

Table 3 provides the U.S. Census population counts for 2010 and 2020 and the Wisconsin Department of Administration's estimates on a biennial basis for 2012 to 2022. Overall, the district area and Dane County population has increased more than the State of Wisconsin.

Table 3
Total Population by Municipality: 2010-2022
Madison Metropolitan School District

Municipality	POPULATION						
	Census 2010	est. 2012	est. 2014	est. 2016	est. 2018	Census 2020	est. 2022
C. Madison	233,209	234,625	240,153	247,207	252,546	269,840	279,012
C. Fitchburg	25,260	25,246	26,090	27,635	28,316	29,609	31,817
V. Maple Bluff	1,313	1,314	1,303	1,304	1,299	1,368	1,433
V. Shorewood Hills	1,565	1,567	1,776	2,077	2,238	2,169	2,168
T. Blooming Grove	1,815	1,815	1,815	1,799	1,630	1,622	1,568
T. Madison	6,279	6,278	6,289	6,341	6,295	6,236	6,212
District Area	269,441	270,845	277,426	286,363	292,324	310,844	322,210
Dane County	488,073	491,555	502,251	518,538	530,519	561,504	582,165
State of Wisconsin	5,686,986	5,703,525	5,732,981	5,775,120	5,816,231	5,893,718	5,947,500

Municipality	PERCENT CHANGE						
	2010 to 2012	2012 to 2014	2014 to 2016	2016 to 2018	2018 to 2020	2010 to 2020	2020 to 2022
C. Madison	0.6%	2.4%	2.9%	2.2%	6.8%	15.7%	3.4%
C. Fitchburg	-0.1%	3.3%	5.9%	2.5%	4.6%	17.2%	7.5%
V. Maple Bluff	0.1%	-0.8%	0.1%	-0.4%	5.3%	4.2%	4.8%
V. Shorewood Hills	0.1%	13.3%	16.9%	7.8%	-3.1%	38.6%	0.0%
T. Blooming Grove	0.0%	0.0%	-0.9%	-9.4%	-0.5%	-10.6%	-3.3%
T. Madison	0.0%	0.2%	0.8%	-0.7%	-0.9%	-0.7%	-0.4%
District Area	0.5%	2.4%	3.2%	2.1%	6.3%	15.4%	3.7%
Dane County	0.7%	2.2%	3.2%	2.3%	5.8%	15.0%	3.7%
State of Wisconsin	0.3%	0.5%	0.7%	0.7%	1.3%	3.6%	0.9%

Source: U. S. Census Bureau & Demographic Services Center, WIDOA



Figure 4 illustrates the population for the Madison Metropolitan School District by age at the 2010 Census and from the 2016-20 American Community Survey (because detailed age data from the 2020 Census is not yet available). Ages 5 to 9 have increased the least of the school age population.

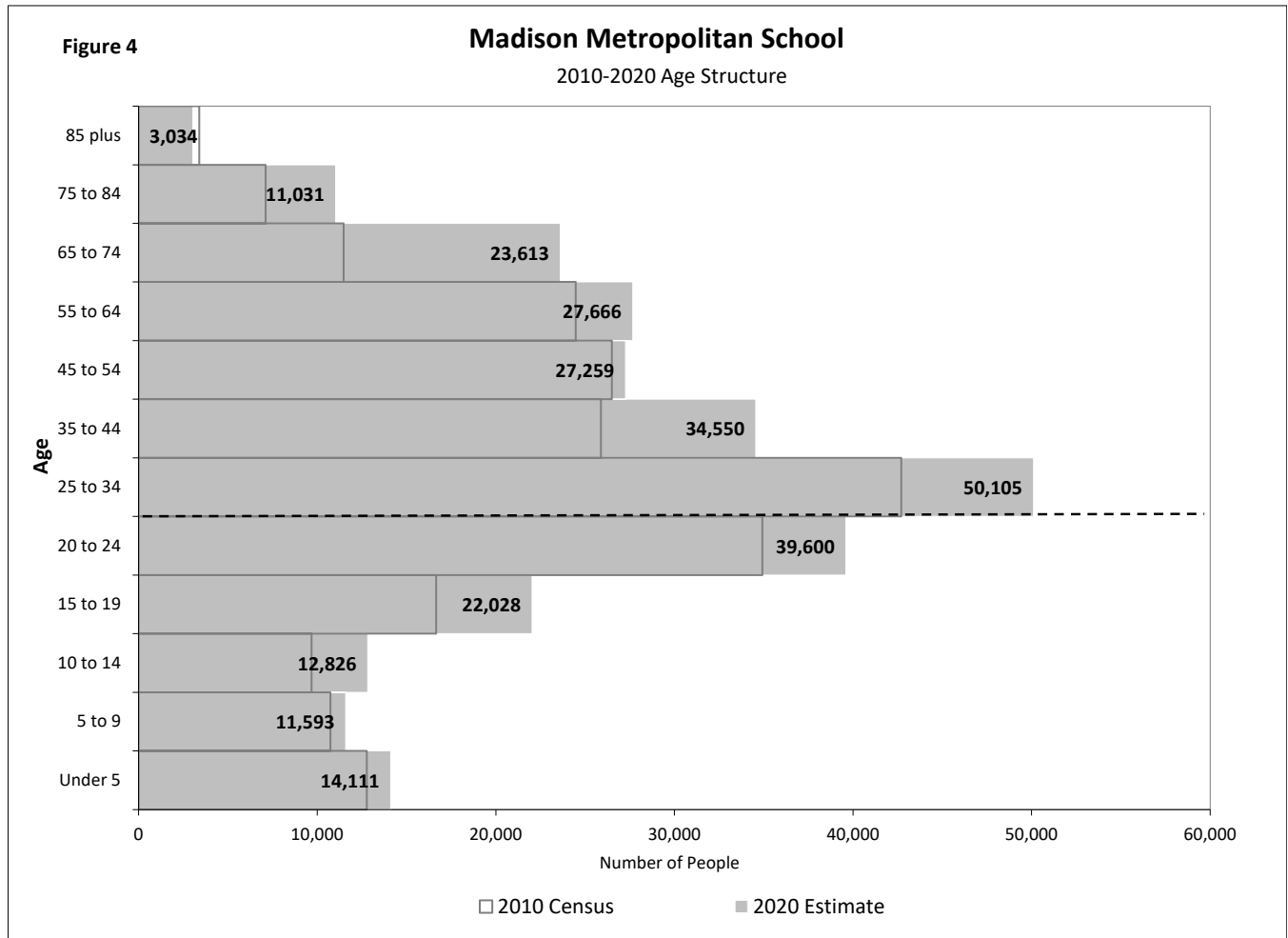


Table 4-A also provides the population as enumerated in 2010 by the decennial Census and estimated over the 2016-20 period by the American Community Survey, showing the change in age structure. In the specific age groups:

- The number of young people ages 1 to 19 increased by an estimated 10,714 or 21% growth.
- Young adults ages 20 to 34 have increased by an estimated 12,076 or 16% growth.
- Adults ages 35 to 64 have increased by an estimated 12,626 residents or 16% growth.
- Adults ages 65 and over have increased the most, growing by 15,692 residents or 71% growth.

TABLE 4-A
Population by Age, 2010-2020
Madison Metropolitan School District

Age	2010	2020	Difference
Under 5	12,770	14,111	1,341
5 to 9	10,735	11,593	858
10 to 14	9,678	12,826	3,148
15 to 19	16,661	22,028	5,367
20 to 24	34,921	39,600	4,679
25 to 34	42,708	50,105	7,397
35 to 44	25,882	34,550	8,668
45 to 54	26,493	27,259	766
55 to 64	24,474	27,666	3,192
65 to 74	11,481	23,613	12,132
75 to 84	7,116	11,031	3,915
85 plus	3,389	3,034	-355
Total	226,308	277,416	51,108

Source: U. S. Census Bureau

Table 4-B shows the in-migration of the Madison Metropolitan School District from the 2016-20 American Community Survey. Almost 77% of district residents live in the home they lived in one year ago. This percentage is higher for owner-occupied homes at 93%, while predictably a smaller percentage of renters at 60% lived at their residence one year ago.

TABLE 4-B
In-migration, one year ago (2020)
Madison Metropolitan School District

	% Living in the Same House	% Moved within Same County	% Moved in from Different County	% Moved in from Different State or Country
Total	76.7	13.6	3.5	6.2
Owner-occupied	92.8	5.1	0.9	1.2
Renter-occupied	60.3	22.4	6.1	11.2
Median age (years)	32.8	23.9	20.8	26.1
Median income (dollars)	\$39,793	\$24,407	\$11,322	\$15,272



Projections Method

To generate school enrollment projections, we rely on a commonly used demographic technique called the “cohort survival” method or the “grade progression ratio” method. This method advances current students through the school system over time and applies rates of transfer (or “survival”) as the students who are now in school age from year-to-year and grade-to-grade. It is through these rates of transfer that we make assumptions about how migration into and out of the district and transfers to and from different school districts will impact future enrollment.

Grade Progression Ratios

Grade progression ratios are used to measure district enrollment changes that have occurred within the school district in the recent past. By examining these, we can better understand recent changes in enrollment. We use these ratios as the rates of transfer to inform future student projections.

Table 5 and Figure 5, on the following page, show the grade progression ratios for the Madison Metropolitan School District. The ratios measure the effects of in- and out-migration and the transfer of students between private and public schools. The ratios are calculated for several pairs of years and then averages of these based on different time frames are calculated for each grade.

To predict future enrollment under different growth assumptions, three sets of grade progression ratios are calculated:

- Baseline averages ten years of progression ratios with outlying ratios excluded (those outside of one standard deviation of the mean).
- Five-Year Trend averages the past five years of progression ratios with the B:K ratio excluded for the 20/21 to 21/22 school year.
- Three-Year Trend averages the past three years of progression ratios with the B:K ratio excluded for the 20/21 to 21/22 school year.

When the ratio average is above 1.0 this indicates that enrollment tends to increase from year to year as each cohort of students advances. When the ratio average is below 1.0 this indicates that enrollment tends to decrease from year to year.

The grade progression ratios can be interpreted in the following manner. The Baseline ratio for 8:9 is 1.060. This means that on average, the ninth-grade classes are 6% larger than the eighth-grade classes from the previous year. The 3:4 Three-Year Trend ratio of .965 indicates that, on average, 96.5% of third graders progress to fourth grade.



TABLE 5
Grade Progression Ratios
Madison Metropolitan School District

YEAR CHANGES	B:K	K:1	1:2	2:3	3:4	4:5	5:6	6:7	7:8	8:9	9:10	10:11	11:12
13-14/14-15	0.654	0.929	0.981	0.970	0.971	0.970	0.974	0.996	0.991	1.061	1.012	1.089	0.981
14-15/15-16	0.637	0.954	0.983	0.964	0.967	0.965	0.975	0.959	0.984	1.044	1.016	1.002	1.063
15-16/16-17	0.634	0.968	0.981	0.973	0.967	0.967	0.963	0.980	1.005	1.064	1.010	0.997	1.123
16-17/17-18	0.607	0.972	0.955	0.968	0.974	0.962	0.954	0.981	0.991	1.097	1.001	1.005	1.163
17-18/18-19	0.599	0.965	0.964	0.973	0.980	0.976	0.986	0.992	0.986	1.075	0.993	0.998	1.127
18-19/19-20	0.606	0.964	0.986	0.976	0.996	0.985	0.971	0.983	0.993	1.076	1.000	1.005	1.127
19-20/20-21	0.522	0.934	0.932	0.951	0.962	0.963	0.940	0.954	0.983	1.039	0.987	1.005	1.117
20-21/21-22	0.514	0.978	0.965	0.958	0.942	0.978	0.939	0.978	0.973	1.044	0.997	1.020	1.138
21-22/22-23	0.518	1.003	0.992	0.984	0.990	1.003	0.931	0.994	0.992	1.053	0.986	0.990	1.132
Baseline	0.617	0.967	0.974	0.971	0.970	0.971	0.963	0.984	0.989	1.060	1.000	1.003	1.118
Five-Year Trend	0.561	0.969	0.968	0.968	0.974	0.981	0.953	0.980	0.985	1.057	0.992	1.004	1.128
Three-Year Trend	0.520	0.972	0.963	0.964	0.965	0.981	0.937	0.975	0.983	1.045	0.990	1.005	1.129

*Shaded progression ratios are excluded from the Baseline Average

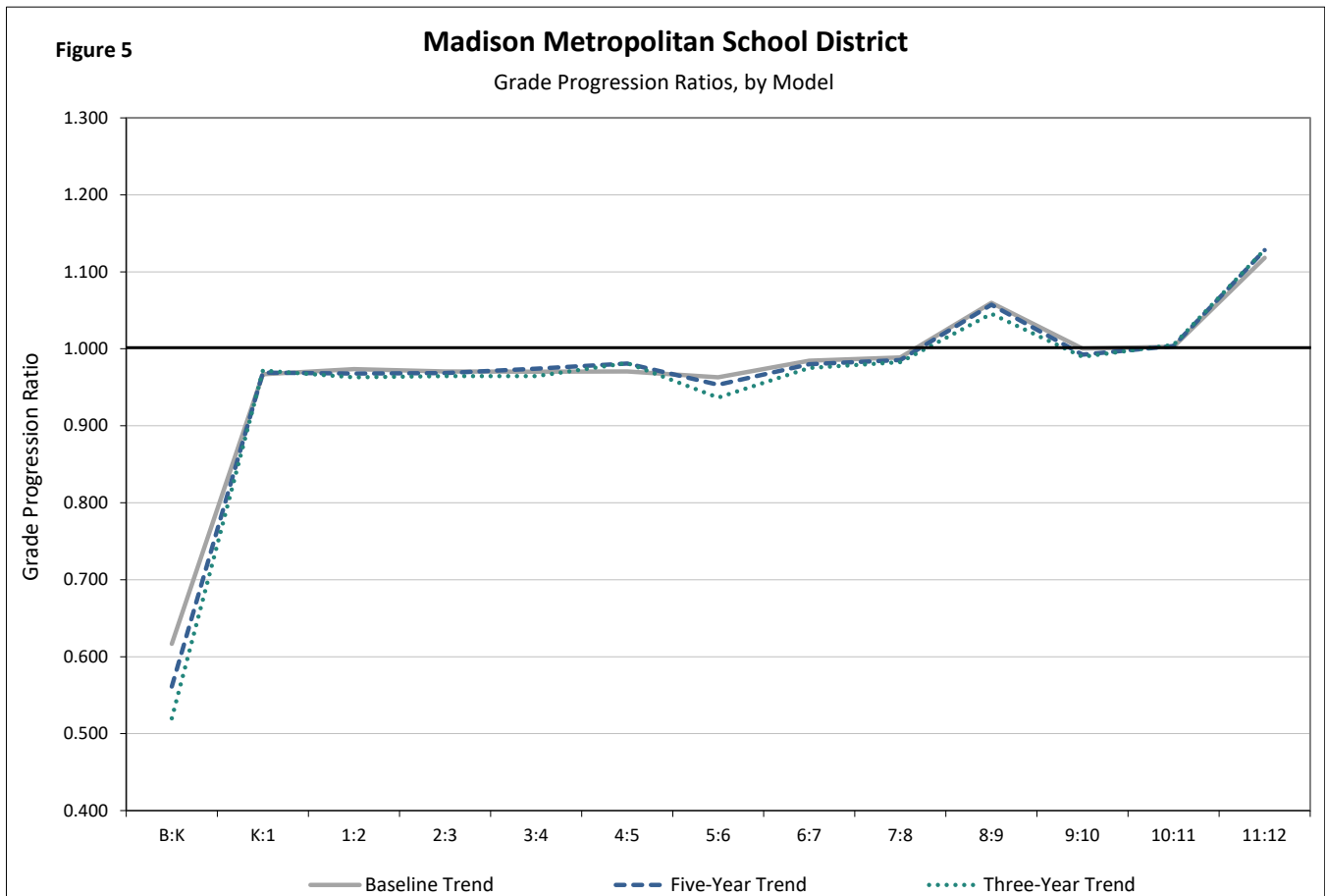


Table 7 shows the observed grade progression ratios between births and 4K and between 4K and kindergarten over the last ten years. The 4K:K ratios are not used in the projection calculations, but they provide an indication that kindergarten classes, on average, are 20% larger than the prior year’s four-year old kindergarten classes.

To generate 4K enrollment projections, the ten-year grade progression ratio average will be used to project 4K enrollment for the Baseline model and the five-year grade progression ratio average for the Five-Year Trend and Three-Year Trend models. The B:K ratio is excluded for the 20/21 to 21/22 school year for the Five-Year Trend and Three-Year Trend models.

TABLE 6
4K Grade Progression Ratios
Madison Metropolitan School District

	B:4K	4K:K
13-14/14-15	0.559	1.151
14-15/15-16	0.544	1.140
15-16/16-17	0.515	1.166
16-17/17-18	0.521	1.180
17-18/18-19	0.515	1.148
18-19/19-20	0.478	1.177
19-20/20-21	0.397	1.093
20-21/21-22	0.392	1.295
21-22/22-23	0.442	1.321
Baseline	0.502	1.160
Five-Year Trend	0.458	1.207
Three-Year Trend	0.419	1.236

*Shaded progression ratios are excluded from the Baseline Average

Comparison of Projections Models

When considering these projections for decision-making, it is important to recognize that population projections of all types, including school enrollment projections, are more accurate in the immediate future than they are farther into the future. This is especially true for grades 4K-5. These three models provide a comparison based on different assumptions regarding births and student progression from grade to grade.

Baseline Projections

The Baseline model projects enrollment using the assumption that long-term average trends year-to-year, grade-to-grade, will continue. This model assumes that the ten-year trend in enrollment and eighteen-year trend in births will be representative of future trends in the district. This model projects that 4K-12 enrollment will decrease from 25,139 students in 2022/23 to 23,884 students in 2027/28, or a decline of 5%.

Five-Year Trend Projections

The Five-Year Trend model uses the grade progression ratios from the last five years and the five-year trend of births in the district area to project what future enrollment would look like if more recent patterns were representative of future trends. With recent migration rates and birth trends weighted more heavily, enrollment in the school district is projected to decline, decreasing from 25,139 students in 2022/23 to 22,627 students in 2027/28, or a 10% decline.

Three-Year Trend Projections

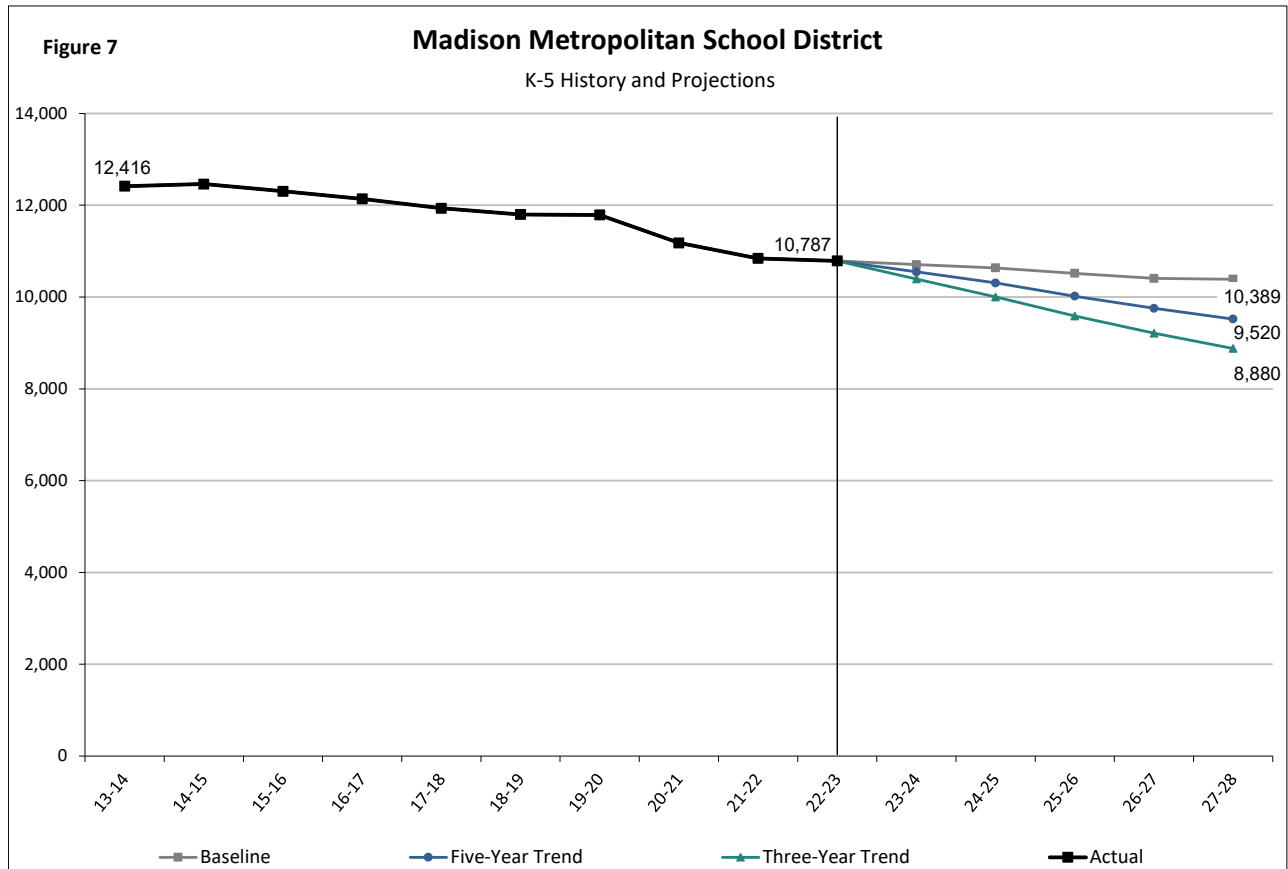
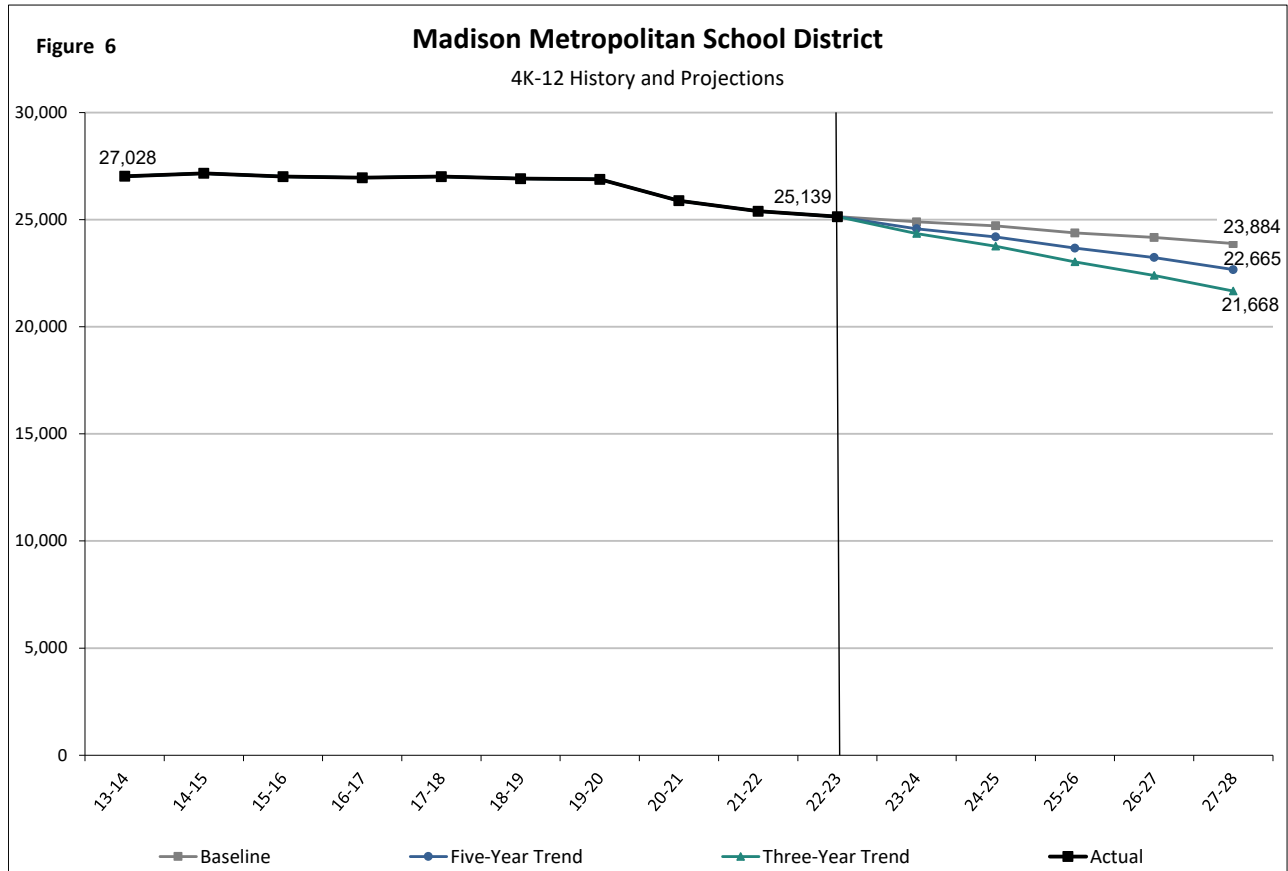
The Three-Year Trend model uses the grade progression ratios from the last three years and the five-year trend of births in the district area to project what future enrollment would look like if even more recent patterns were representative of future trends. For the Three-Year Trend model, district enrollment is projected to decrease from 25,139 students in 2022/23 to 21,630 students in 2027/28, or a decline of 14%.

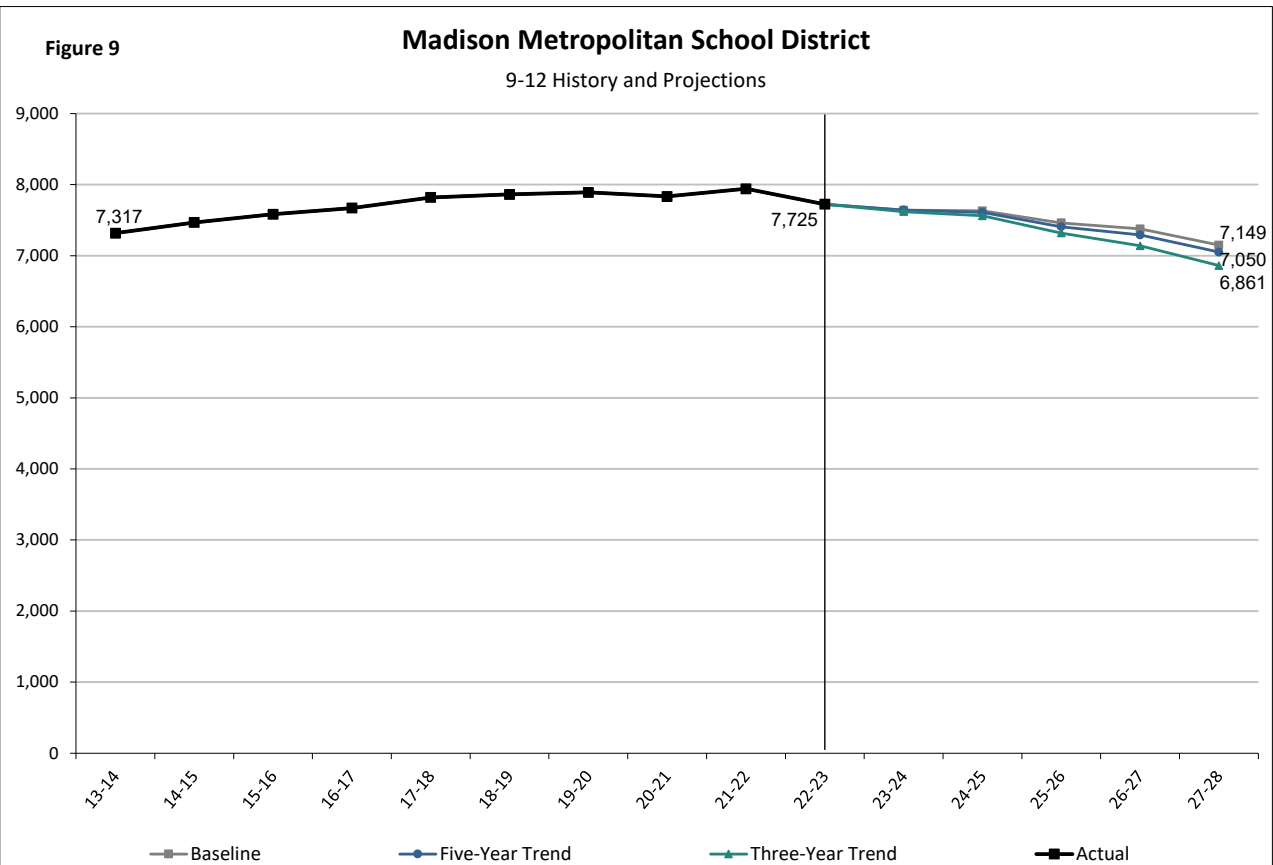
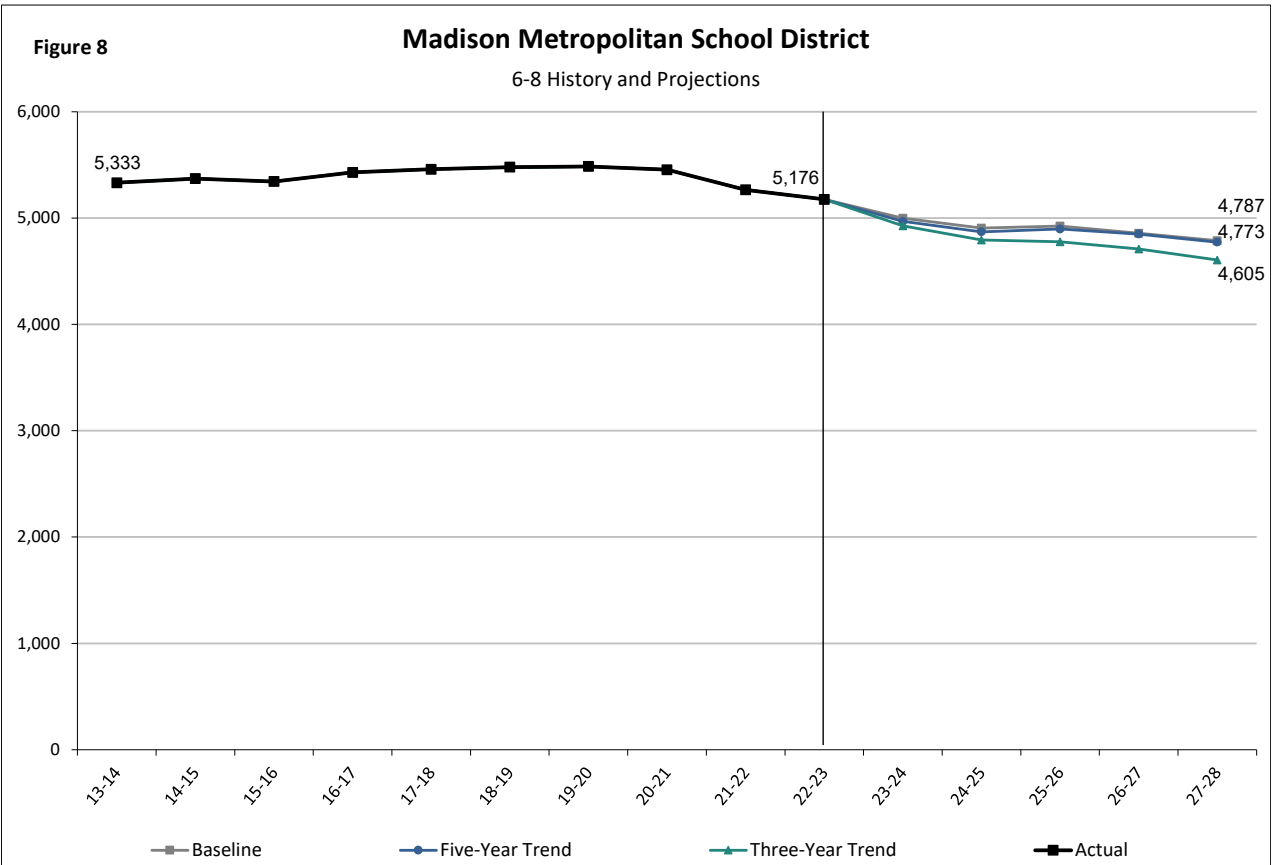
TABLE 7
Summary of 4K-12 Projections
Madison Metropolitan School District

	23-24	24-25	25-26	26-27	27-28
Baseline	24,896	24,711	24,382	24,171	23,884
Five-Year Trend	24,573	24,193	23,673	23,232	22,665
Three-Year Trend	24,352	23,759	23,032	22,398	21,668
Average	24,607	24,221	23,696	23,267	22,739

On page 15 and 16, Figures 6-9 compare the three enrollment projection models broken down by 4K-12 enrollment and by grade groupings (K-5, 6-8, and 9-12).







District-wide Projections

The district-wide enrollment projections are based on models that incorporate past and projected births and the district's own 3rd Friday enrollment. Because most of the students in the district's schools over the next few years have already been born or are already in school, and because their grade progression from one year to another is reasonably predictable, the total district-wide projections should be viewed as having a high-level of accuracy. Table 8 provides the district projections using the Five-Year Trend model to project enrollment by total, grade grouping, and individual grades.

TABLE 8
District Projections Summary
Madison Metropolitan School District

GRADE	SCHOOL YEAR				
	23-24	24-25	25-26	26-27	27-28
4K	1,412	1,403	1,349	1,336	1,322
K	1,751	1,731	1,721	1,654	1,638
1	1,726	1,696	1,677	1,667	1,603
2	1,779	1,670	1,642	1,623	1,613
3	1,764	1,723	1,617	1,590	1,572
4	1,804	1,718	1,678	1,576	1,549
5	1,726	1,770	1,685	1,646	1,546
6	1,654	1,646	1,687	1,607	1,569
7	1,628	1,621	1,613	1,653	1,574
8	1,687	1,604	1,597	1,589	1,629
9	1,906	1,784	1,696	1,689	1,681
10	1,803	1,892	1,770	1,683	1,676
11	1,884	1,810	1,899	1,777	1,689
12	2,049	2,125	2,042	2,142	2,004
TOTAL	24,573	24,193	23,673	23,232	22,665
4K	1,412	1,403	1,349	1,336	1,322
K-5	10,550	10,308	10,020	9,756	9,521
6-8	4,969	4,871	4,897	4,849	4,772
9-12	7,642	7,611	7,407	7,291	7,050
Yr-Yr change	-566	-380	-520	-441	-567



District-wide enrollment projections point to the Madison Metropolitan School District experiencing decreased enrollment in the near term. In five years, the district might expect:

4K-12 enrollment will likely decrease by 2,512 students, or a 10% decline.

- As births and four-year-old kindergarten trends decline, 4K enrollment will likely see a decrease of 167 students or a 11.5% decline.
- With births and kindergarten trends showing decline and recent enrollment declines of elementary students, grades K-5 enrollment will likely see a decrease of 1,266 students or a 11.7% decline.
- As the elementary students move to middle school, 6-8 enrollment shows a decline of 404 students, a decrease of 7.8%.
- High school enrollment (grades 9-12) will likely see a decrease of 675 students or an 8.7% decline.

Because the projections found in this report incorporate the consequences of migration to and from the district, any significant and sustained interruption of current or recent migration patterns will erode these models' accuracy from the initiation point of the new pattern. The district should continue to monitor enrollment change and compare it with these projections, to assess the district's trajectory of future student enrollment.

