

Enrollment Projections Supplement



MONROE
SCHOOL DISTRICT

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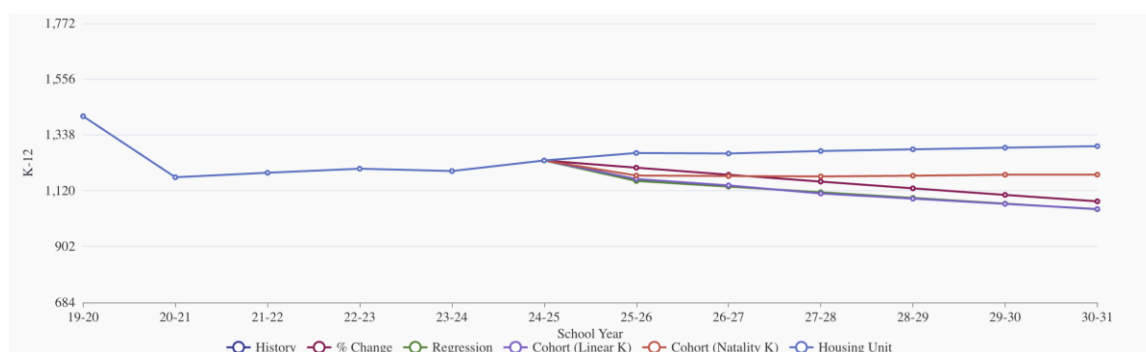
ENROLLMENT PROJECTIONS SUPPLEMENT

This supplement contains the detailed enrollment projection information summarized in the district’s Facility Master Plan. The projections have been generated through reviewing community growth issues, planning and zoning information, historical enrollment data, computerized enrollment projection models, and estimating the impact of future enrollments on the capacity of school buildings. The consulting team has used both qualitative and quantitative information to develop the projections. A variety of “headcount” (rather than FTE) enrollment projection models have been used as a means of looking at future growth in different ways. Because most of these models use historical information as the basis for projections, the school district is encouraged to update these projections annually.

2.1 Historical Data

Historical enrollment information shows a slight increase in student enrollment over the past six years. Exhibit 2-1 charts the enrollment history for the Monroe School District for K-12 students, as well as shows the projections across five different models.

**EXHIBIT 0-1
MONROE SCHOOL DISTRICT
ENROLLMENT HISTORY – GRAPHIC¹**



Source: K12enroll.com

¹ The resolution of graphical exhibits in this study have often been adjusted for improved comparative purposes. As a result, the slope of the lines on many line charts may be accentuated more than if the chart had a zero base in the vertical scale.

2.2 Enrollment Projection - Average Percentage Change

2.2.1 Methodology

The average percentage change model calculates future school enrollment growth based on the historical average enrollment changes. This model multiplies the historical average percentage change times the prior year enrollment to project future enrollments.

2.2.2 Calculations and Projections

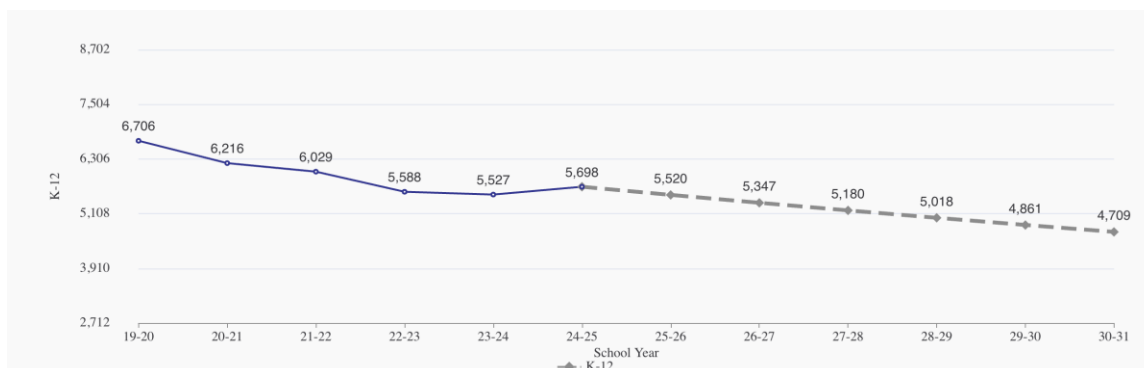
The average enrollment change during this period for grades K-5 indicates a decrease of 6% while grades 6-8 project a decrease of 6.5%. The high school enrollment during this period projects a decrease of 27%. Overall, the K-12 enrollment is projected to decrease by 14.7%. This model is incredibly sensitive to grade-level bubbles of students moving through the system, and does not always catch recent increases in high school retention and enrollment. Overall, this model projects that enrollments for the K-12 system will decrease by 811 students over the next six years. Exhibit 2-2 is a table detailing the projected enrollments using the percentage change factors, which are calculated by averaging the enrollment increases and decreases over the last six years. Exhibit 2-3 is a graphical representation of the table information.

EXHIBIT 0-2 MONROE SCHOOL DISTRICT PERCENTAGE CHANGE MODEL

	25-26	26-27	27-28	28-29	29-30	30-31
K-5	2,543	2,512	2,481	2,450	2,420	2,390
6-8	1,327	1,309	1,292	1,275	1,258	1,241
9-12	1,669	1,567	1,471	1,381	1,297	1,218
K-12	5,520	5,347	5,180	5,018	4,861	4,709

Source: K12enroll.com

**EXHIBIT 0-3
 MONROE SCHOOL DISTRICT
 PERCENTAGE CHANGE MODEL – GRAPHIC**



Source: K12enroll.com

2.3 Enrollment Projection - Linear Regression Model

2.3.1 Methodology

Linear regression is a mathematical approach to estimating an unknown future value of a variable by performing statistical calculations on known historical values. Once calculated, several future values for different future dates can then be plotted to provide a “regression line” or “trend line”. There are many types of regression formulas. Since recent enrollment growth has followed a more-or-less constant path, a linear regression formula was chosen. This straight-line model estimates future enrollment -- a model that finds the linear trend based on the historical data.

2.3.2 Calculations and Projections

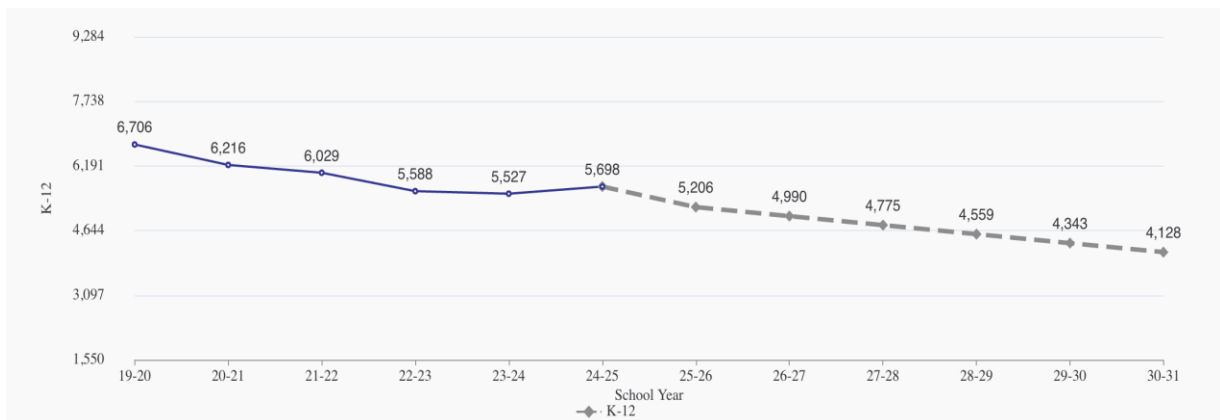
Exhibit 2-4 is a table detailing the projected enrollment using the regression model and based on the historical enrollments for the last six years. This model predicts that enrollment for grades K-5 will decrease by 3.2%, middle school enrollment will decrease by 10.7% and high school enrollment will decrease by 58.4%. Overall, this model predicts that the K-12 system will decrease by 21.7%, or approximately 1,078 students over the next six years. Exhibit 2-5 is a graphical representation of enrollment history and the K-12 projection from the table data. This model is overly influenced by historical drops and the consulting team does not consider this high school decrease to accurately represent the anticipated or most reliable enrollment projection.

**EXHIBIT 0-4
MONROE SCHOOL DISTRICT
LINEAR REGRESSION MODEL**

	25-26	26-27	27-28	28-29	29-30	30-31
K-5	2,473	2,457	2,442	2,426	2,410	2,395
6-8	1,248	1,221	1,195	1,168	1,141	1,114
9-12	1,485	1,312	1,138	965	792	618
K-12	5,206	4,990	4,775	4,559	4,343	4,128

Source: K12enroll.com

**EXHIBIT 0-5
MONROE SCHOOL DISTRICT
LINEAR REGRESSION MODEL – GRAPHIC**



Source: K12enroll.com

2.4 Enrollment Projection – Cohort Survival Model (Linear K)

2.4.1 Methodology

The cohort survival method calculates the growth or decline in enrollment in a grade level over a period of six years based on the ratio of students who are enrolled each of the previous years, the “survival rate”. This ratio is then applied to the incoming class to calculate the trends in that class as it “moves” or graduates through the school system. For example, if history shows that between the first and second grades, the classes for the last six years have grown by an average of 3.5%, then the size of incoming classes for the next six years are calculated by multiplying them by 103.5%. If the history shows a declining trend, the multiplying factor will be less than 100%. The cohort survival model accounts for the net effect of students transferring in and out of the school system, or between schools, for any reason. For example, if 15 students transfer out of the public school system into a private school and 20 students transfer in because of a new business in town, the net effect is five additional students. This increase in students will be reflected in a higher “survival” rate.

One of the more difficult challenges of projecting enrollments with the cohort survival model is the determination of future kindergarten enrollments. This is critical, especially for communities experiencing rapid demographic change. There are two methods of projecting kindergarten enrollments. This first model (Linear K) projects future kindergarten enrollments using a linear regression line based on the historical kindergarten enrollments.

2.4.2 Calculations and Projections

Exhibit 2-6 is a table detailing the projected enrollments using the cohort survival method based on the enrollment over the last six years and using a linear regression model for the kindergarten projection. When analyzing future enrollment projections, one must always be aware of the kindergarten enrollment data. The impact of the survival cohort, especially in the elementary grades, is most influenced by kindergarten enrollment. If kindergarten enrollment increases, all future years are similarly affected.

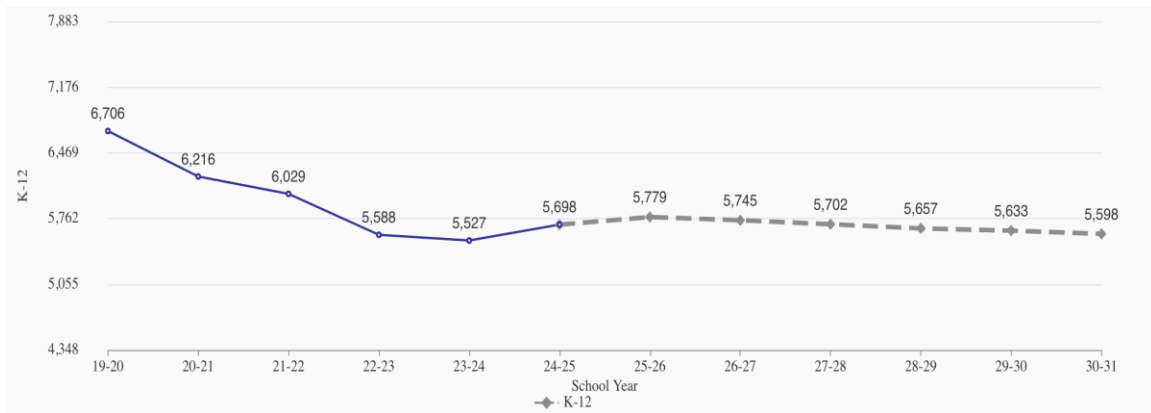
This model predicts that grades K-5 will decrease by 5.2%, grades 6-8 will decrease by 6.8% and grades 9-12 will increase by 1.6%. The overall K-12 enrollment projection is for a loss of 181 students, or 3.1%, over the next six years. Exhibit 2-7 is a graphical representation of the table data.

**EXHIBIT 0-6
 MONROE SCHOOL DISTRICT
 COHORT SURVIVAL MODEL (LINEAR K)**

	25-26	26-27	27-28	28-29	29-30	30-31
K-5	2,524	2,521	2,482	2,424	2,419	2,393
6-8	1,380	1,349	1,323	1,323	1,319	1,300
9-12	1,875	1,875	1,897	1,910	1,895	1,905
K-12	5,779	5,745	5,702	5,657	5,633	5,598

Source: K12enroll.com

**EXHIBIT 0-7
 MONROE SCHOOL DISTRICT
 COHORT SURVIVAL MODEL (LINEAR K) – GRAPHIC**



Source: K12enroll.com

2.5 Enrollment Projection – Cohort Survival Model (Natality K)

2.5.1 Methodology

As stated earlier, when analyzing future projections, one must always be aware of the kindergarten enrollment data. The impact of the survival cohort, especially in the elementary grades, is most influenced by the kindergarten enrollment. If kindergarten enrollment increases, all future years are similarly affected. Instead of using a linear regression formula to determine kindergarten enrollments, this model uses birth rate (natality) information. It is based on the correlation between historical birth rates (natality rates) and historical kindergarten enrollments. The natality correlation model works well when projecting kindergarten enrollments for the next six years but must be combined with the regression model when projecting for extended periods.

2.5.2 Calculations and Projections

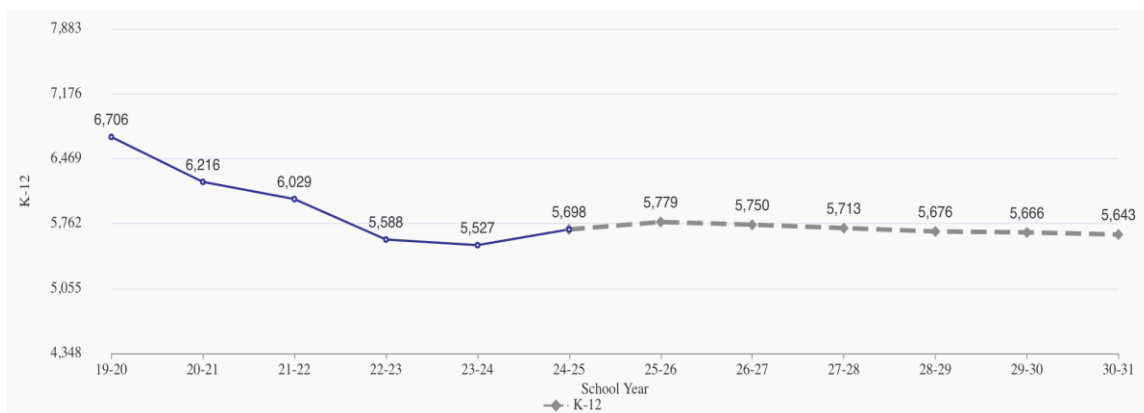
Exhibit 2-8 details the projections impacted by birth rates in Snohomish County. This model shows decreases in line with state and national averages of declining birth rates. For elementary school this model projects a decrease of 3.6%, for middle school a decrease of 5.8% and for high school an increase of 1.6%. Overall, this model predicts a K-12 decrease of 2.4% over the next six years, representing 136 students. Exhibit 2-9 is a graphical representation of the table data.

**EXHIBIT 0-8
MONROE SCHOOL DISTRICT
COHORT SURVIVAL MODEL (NATALITY K)**

	25-26	26-27	27-28	28-29	29-30	30-31
K-5	2,524	2,526	2,493	2,443	2,452	2,438
6-8	1,380	1,349	1,323	1,323	1,319	1,300
9-12	1,875	1,875	1,897	1,910	1,895	1,905
K-12	5,779	5,750	5,713	5,676	5,666	5,643

Source: K12enroll.com

EXHIBIT 0-9
MONROE SCHOOL DISTRICT
COHORT SURVIVAL MODEL (NATALITY K) – GRAPHIC



Source: K12enroll.com

2.6 Enrollment Projection – Students Per Housing Unit

2.6.1 Methodology

The students per housing unit model of projecting growth uses housing unit data from the U.S. Census. The number of students in the district is divided by the housing unit count to develop a ratio of students per housing unit. This ratio is commonly called a "yield factor." That yield factor is then applied to projected future housing growth for the study period. (It is important to note that a yield factor is different than a student generation rate commonly used in impact fee studies. Student generation rates deal exclusively with new housing construction and give you a picture at a point in time of how many students live only in new housing. Student yield factors deal with how many students live in all housing in the district. It includes students living in "old houses" as well as students moving into new housing.)

2.6.2 Calculations and Projections

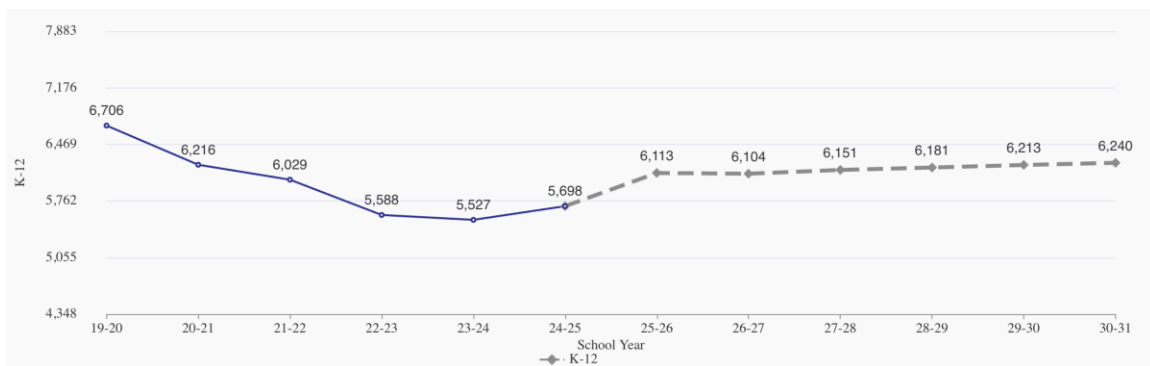
As detailed in Exhibit 2-10, this model predicts that grades K-5 will increase by 2.1%, grades 6-8 will increase by 1.9% and grades 9-12 will increase by 2.1%. The overall K-12 enrollment projection is for a relatively flat increase of 127 students, or 2.0%, over the next six years. Exhibit 2-11 is a graphical representation of the table data.

**EXHIBIT 0-10
 MONROE SCHOOL DISTRICT
 STUDENT PER HOUSING UNIT MODEL**

	25-26	26-27	27-28	28-29	29-30	30-31
K-5	2,590	2,588	2,607	2,620	2,633	2,645
6-8	1,376	1,373	1,383	1,391	1,397	1,403
9-12	2,147	2,143	2,161	2,170	2,183	2,192
K-12	6,113	6,104	6,151	6,181	6,213	6,240

Source: K12enroll.com

**EXHIBIT 0-11
 MONROE SCHOOL DISTRICT
 STUDENT PER HOUSING UNIT MODEL**



Source: K12enroll.com

2.7 Summary

2.7.1 K-12 Summary Information

The consulting team used five different enrollment projection models to estimate future enrollments, discounting one of them as referenced above. Each model emphasizes different types of data and therefore is limited in its effectiveness as a predictive tool. Although all models use historical information, two models, (the percentage change model and the regression model) place special emphasis on that historical data. These models are quite effective predictors if there is no forecast of rapid community growth or decline and student population rates have had minimal fluctuation.

The other three models use historical enrollments but also take into account student mobility patterns and the effects of the natality rates in prior years. The two cohort survival models are perhaps the best-known predictive tool using this type of data. However, like the percentage increase model and the regression model, the cohort survival model loses its predictive capabilities in communities that experience, or are expected to experience, very rapid changes in student growth or decline.

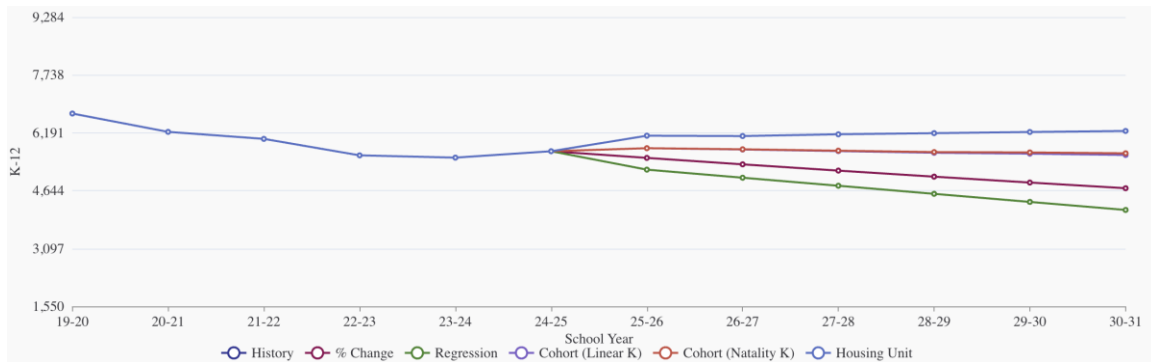
One model indicates a relatively flat enrollment growth, while two models indicate nearly flat projections. The remaining two models indicate a steady decline in enrollment. This relatively similar pattern of projections increases the overall confidence of the projections. Exhibit 2-12 is the summary table of the K-12 projections. Exhibit 2-13 is a graphic representation of the data in the table.

**EXHIBIT 0-12
MONROE SCHOOL DISTRICT
SUMMARY OF K-12 MODELS**

	25-26	26-27	27-28	28-29	29-30	30-31
% Change	5,520	5,347	5,180	5,018	4,861	4,709
Regression	5,206	4,990	4,775	4,559	4,343	4,128
Cohort (Linear K)	5,779	5,745	5,702	5,657	5,633	5,598
Cohort (Natality K)	5,779	5,750	5,713	5,676	5,666	5,643
Student per Housing Unit	6,113	6,104	6,151	6,181	6,213	6,240

Source: K12enroll.com

**EXHIBIT 0-13
 MONROE SCHOOL DISTRICT
 K-12 ENROLLMENT SUMMARY - GRAPHIC**



Source: K12enroll.com

Based on the information in the sections and exhibits above, the consulting team has calculated a “best estimate” that we believe most accurately represents the general direction of the prediction models.

Typically, the consulting team recommends that the district use this “best estimate” model for planning. The consulting team has also calculated a “lower estimate” and “higher estimate” for consideration by the district as they reflect on local issues that may have near-term impacts not factored into the projections. Exhibit 2-14 is a table detailing the “lower estimate,” “higher estimate,” and “best estimate.”

**EXHIBIT 0-14
 MONROE SCHOOL DISTRICT
 K-12 ENROLLMENT ESTIMATE RECOMMENDATION**

	25-26	26-27	27-28	28-29	29-30	30-31
Lower Estimate	5,377	5,204	5,027	4,852	4,683	4,514
Best Estimate	5,679	5,587	5,504	5,418	5,343	5,263
Higher Estimate	5,981	5,970	5,981	5,984	6,003	6,012

Source: K12enroll.com

The green line in Exhibit 2-15 represents the “best estimate” of future enrollments. Both the “lower estimate” and “higher estimate” are also plotted on the graphic representation of the information in Exhibit 2-14.

EXHIBIT 0-15
MONROE SCHOOL DISTRICT
K-12 ENROLLMENT ESTIMATE RECOMMENDATION – GRAPHIC



Source: K12enroll.com

2.7.2 Grade Span Summary Information

Most school planning activities related to enrollment projections require some additional information in addition to the overall K-12 estimates. The consulting team has provided additional information on a grade span basis for the district’s consideration. Exhibit 2-16 provides details of the “best” predictions on a grade level grouping basis. (Please note that totals on the grade level “best” groupings may not equal the totals on K-12 summary table above due to rounding and a variety of technical matters related to the statistical models used.) Exhibits 2-17 through 2-19 are a series of graphical representations of the information in the table related to the “lower estimate,” “higher estimate,” and “best estimate” of the district’s three current grade spans.

EXHIBIT 0-16
MONROE SCHOOL DISTRICT
SUMMARY OF GRADE LEVEL SPAN MODELS

K-5						
	25-26	26-27	27-28	28-29	29-30	30-31
% Change	2,543	2,512	2,481	2,450	2,420	2,390
Regression	2,473	2,457	2,442	2,426	2,410	2,395
Cohort (Linear K)	2,524	2,521	2,482	2,424	2,419	2,393
Cohort (Nativity K)	2,524	2,526	2,493	2,443	2,452	2,438
Student per Housing Unit	2,590	2,588	2,607	2,620	2,633	2,645
Lower Estimate	2,492	2,478	2,445	2,398	2,382	2,354
Best Estimate	2,530	2,520	2,501	2,472	2,466	2,452
Higher Estimate	2,568	2,562	2,557	2,546	2,550	2,550

Source: K12enroll.com

6-8						
	25-26	26-27	27-28	28-29	29-30	30-31
% Change	1,327	1,309	1,292	1,275	1,258	1,241
Regression	1,248	1,221	1,195	1,168	1,141	1,114
Cohort (Linear K)	1,380	1,349	1,323	1,323	1,319	1,300
Cohort (Nativity K)	1,380	1,349	1,323	1,323	1,319	1,300
Student per Housing Unit	1,376	1,373	1,383	1,391	1,397	1,403
Lower Estimate	1,291	1,266	1,241	1,222	1,201	1,176
Best Estimate	1,342	1,320	1,303	1,296	1,286	1,271
Higher Estimate	1,393	1,374	1,365	1,370	1,371	1,366

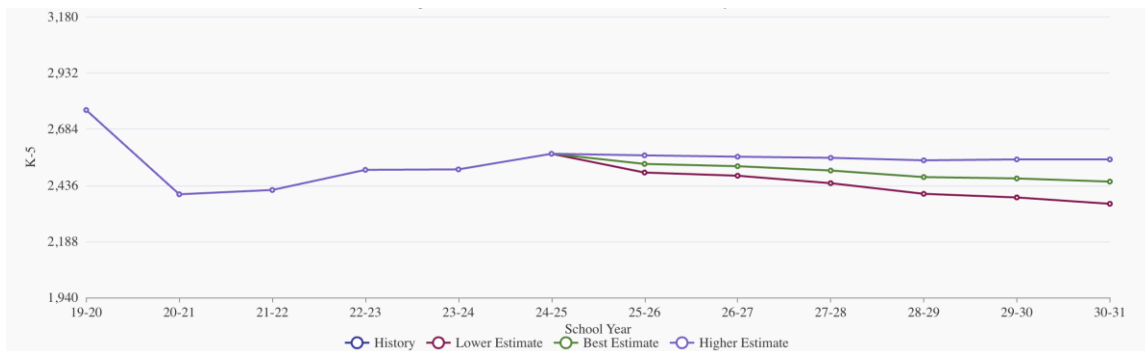
Source: K12enroll.com

9-12

	25-26	26-27	27-28	28-29	29-30	30-31
% Change	1,669	1,567	1,471	1,381	1,297	1,218
Regression	1,485	1,312	1,138	965	792	618
Cohort (Linear K)	1,875	1,875	1,897	1,910	1,895	1,905
Cohort (Natality K)	1,875	1,875	1,897	1,910	1,895	1,905
Student per Housing Unit	2,147	2,143	2,161	2,170	2,183	2,192
Lower Estimate	1,588	1,467	1,349	1,232	1,110	994
Best Estimate	1,810	1,754	1,712	1,667	1,612	1,567
Higher Estimate	2,032	2,041	2,075	2,102	2,114	2,140

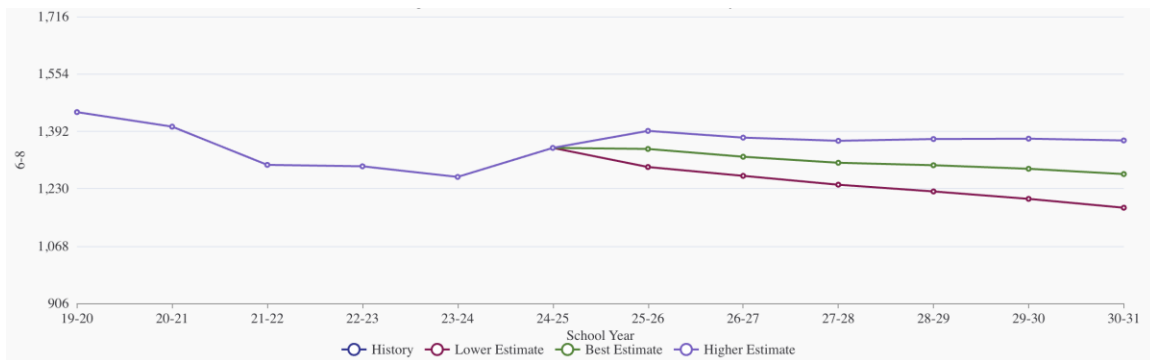
Source: K12enroll.com

EXHIBIT 0-17
MONROE SCHOOL DISTRICT
SUMMARY OF ELEMENTARY LEVEL MODELS – GRAPHIC



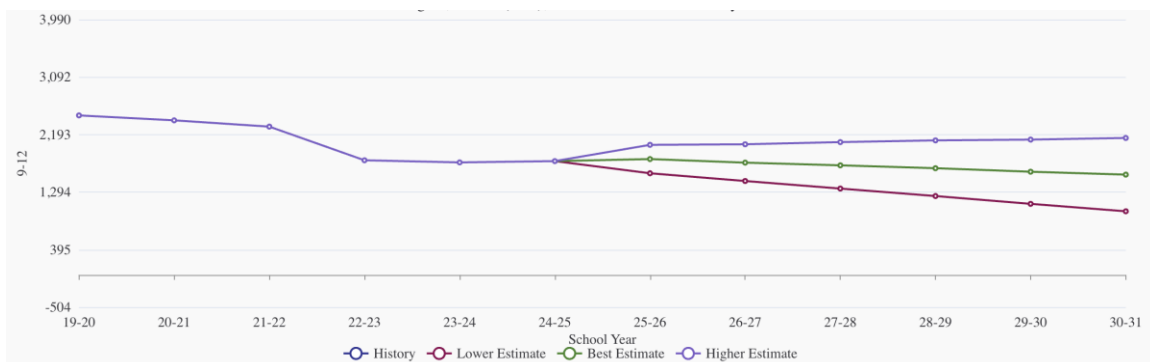
Source: K12enroll.com

**EXHIBIT 0-18
 MONROE SCHOOL DISTRICT
 SUMMARY OF MIDDLE LEVEL MODELS – GRAPHIC**



Source: K12enroll.com

**EXHIBIT 0-19
 MONROE SCHOOL DISTRICT
 SUMMARY OF HIGH SCHOOL MODELS – GRAPHIC**



Source: K12enroll.com

2.7.3 Additional Considerations

Every District has unique circumstances that should be considered when utilizing enrollment projection information, and the Monroe School District has at least one important item that should be factored into enrollment planning.

- a) Monroe School District offers several unique programs within the region through Sky Valley Education Center that bring a number of students in from other districts. If other districts were to begin offering similar programs in their districts, this would likely impact the district's enrollment projections.