

# 2012 Frederick County Pupil Yield Study

October 24, 2014



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## Acknowledgements

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# INTRODUCTION

The Frederick County Public Schools and the County Planning Department have used pupil yield factors since the 1980's for various comprehensive planning and capital facility planning purposes. In 1991 with the adoption of the County's Adequate Public Facilities Ordinance (APFO) the use of pupil yield factors was specifically applied to the testing of residential development projects to determine the adequacy of school capacity. Through most of the 1990's the pupil yield factors were developed on a countywide basis and not at the individual school district.

It was not until 1998 that a more detailed student survey was conducted by the Frederick County Public Schools to help in developing pupil yield factors by individual school districts. This survey, which was distributed to every student, was the first to track the number of students, their grade, and the dwelling type for every family.

Subsequent updates to the pupil yield factors using similar survey data were conducted in 2005 and 2007. The goal at that time was to update the factors every two years to better account for changes in demographics, household size, and the type of dwellings being constructed.

This 2014 report documents the 2012 Pupil Yield Study for Frederick County Public Schools. An earlier update initiated in 2009 was delayed due to redistricting to accommodate the newly constructed Oakdale High School. The redistricting resulted in changes to feeder patterns and the number of students in each school. Due to these changes, it was decided that a pupil yield update should be delayed until Oakdale High School included students at all grade levels, which occurred in September of 2012. The delay provides a more accurate reflection of pupil yields based on housing units within each school district feeder pattern.

This report is organized into the following sections:

- Background Data – provides background information on school enrollments and housing construction trends.
- Methodology - presents the methodology used for the student survey, generation of housing totals by type of unit for each school district, and the resulting pupil yield factors.
- 2012 Pupil Yield Rates – summary of countywide rates by grade level
- Conclusions and Next Steps
- Appendix - 2012 Pupil Yield Study Rates by individual school districts

# BACKGROUND DATA

## School Facilities and Enrollment

According to the 2014 Frederick County Public Schools Educational Facilities Master Plan (EFMP), the school system is comprised of the following facilities:

- Elementary Schools – 39 (including three charter schools)
- Middle Schools – 16 (including three charter schools)
- High Schools – 10

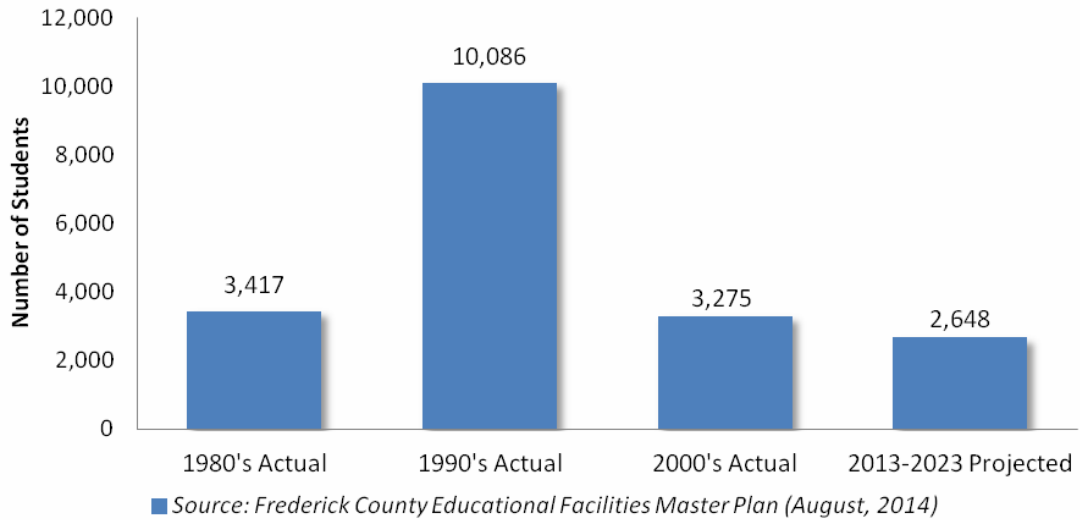
The total equated student enrollment in 2013 was 40,172 including 18,623 elementary students, 8,993 middle students, 12,328 high school students, and 228 students in special schools. The system wide enrollment is 89% of the total state rated capacity of the school facilities.

## Projected Enrollments

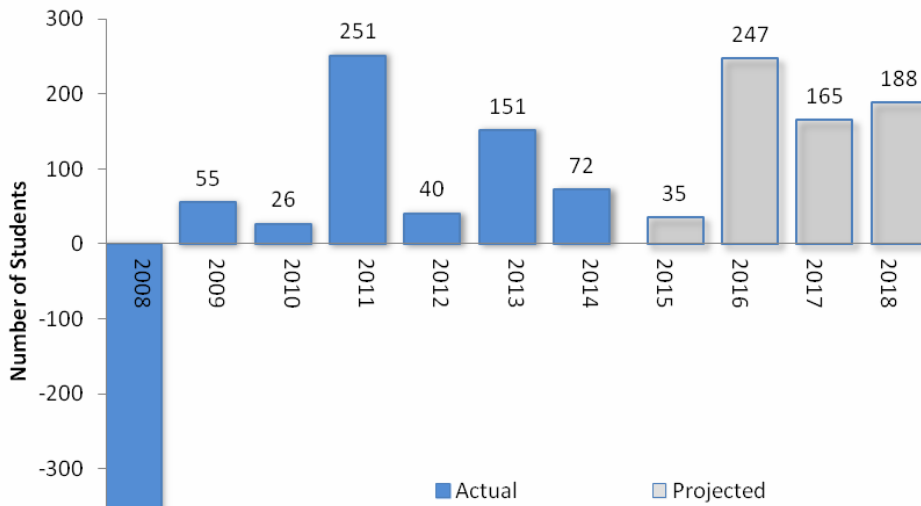
The 2014 EFMP projected enrollment growth for the period 2013 to 2023 to be lower than was projected in the 2013 EFMP. The projected enrollment is 1,501 students lower than the 10-year projection for the period 2012-2022 from the 2013 EFMP. Most of this decrease is at the elementary level. Within this 10-year period the annual enrollment increases are projected to increase starting in the 2016 school year and to continue through 2023.

- Projected enrollment increases by grade level for **2013-2023** are:
  - Elementary – 1,117 students
  - Middle – 539 students
  - High – 990 students
  - 10-year Total – 2,648 students

## Enrollment Growth by Decade Frederick County Public Schools



## Annual Enrollment Increase Frederick County Public Schools



Source: Frederick County, Educational Facilities Master Plan (August, 2014)

## Housing Construction Trends

Since the last pupil yield study in 2007 the recession has significantly impacted housing construction in the county. During the primary recession period of 2008 to 2012 the average annual number of housing permits issued was 640 dwellings/year, which includes the county and all of the municipalities. The county experienced a run of five (5) consecutive years with housing permits issued below 1,000 dwellings/year, which last occurred in the period 1967 to 1971. This is a significant drop from average annual permit activity for 2000 to 2010 of 1,600 dwellings/year. While permit activity has picked up in 2012 and 2013 it is not expected that the county will be back to its historical building levels for the near future. It may be the case where housing construction activity never reach our historical building levels, but settle into a new normal.

Two effects of the recession and in particular the housing bubble are an increase in renting, rather than buying a home and families with children staying in townhouses rather than moving up to single-family detached homes. The increased demand in the rental market is illustrated by the significant increase in multi-family construction in 2012 and 2013 with 277 and 522 dwelling units constructed per year respectively. In 2013 the number of multi-family dwelling constructed represented 42% of the total dwellings constructed in the county. Almost all of this multi-family construction has taken place in the City of Frederick. This trend may extend several more years as several multi-family development projects located in the county come on line.

The financial affects of the housing bubble, with the drop in housing values and the loss of jobs has created a situation where many families have remained either in a multi-family dwelling or townhouse as their children reach school age. This situation has caused a resulting increase in the pupil yield rates for townhouses and multi-family dwellings.

### Housing Units Permitted – Frederick County

Calendar Year	Total Dwelling Units	Single Family	Townhouse	Multi-Family
2012	893	448	168	277
2011	533	366	121	46
2010	743	463	223	57
2009	723	415	218	90
2008	562	361	109	92
2007	1,054	590	246	218
5 Year Avg.	691	411	168	112
10 Year Avg.	1,154	642	283	224

## Two-over-Two Dwellings

Over the recent years a new housing unit type has emerged in Frederick County, the 'two-over-two' dwelling. This product is a 4-story attached type dwelling with one unit occupying both the ground and 1<sup>st</sup> floor and a second unit occupying both the 3<sup>rd</sup> and 4<sup>th</sup> floors. While the dwellings have thus far been constructed as condominiums they could also be developed as apartment/rental units. In 2012 a separate analysis of two-over-two projects in Urbana and the Dearbought development in the City of Frederick was conducted to determine if the pupil yield rate would be different from either townhouse or multi-family dwelling types. It was determined that the pupil yield rate for two-over-two dwellings fell between the rates for townhouses and multi-family. Based on this analysis unique rates for two-over-two's have been used for Adequate Public Facility Ordinance (APFO) reviews since June 2012. However, it should be noted that two-over-two's have not been specifically identified as a separate dwelling type for the impact fees or school construction fees where they are counted as multi-family dwelling types. The table below compares the 2012 two-over-two pupil yield rates with the pupil yield rates for townhouses and multi-family.

<b>Dwelling Type</b>	<b>Elementary</b>	<b>Middle</b>	<b>High</b>	<b>All Grades</b>
Townhouse	.265	.099	.128	.492
Two-Over-Two	.13	.05	.06	.24
Multi-Family	.116	.038	.051	.205

## **METHODOLOGY**

The following presents the methodology used by the Community Development Division (CDD) and Frederick County Interagency Information Technologies (IIT) Geographic Information Systems (GIS) staff in generating the pupil yield factors.

This study establishes an improved methodology, from what was done in 2007, with respect to matching the student information with the dwelling type and location. This study is based on the Student Information Cards that were distributed to students in September 2012.

### **Student Survey**

As in prior pupil yield surveys a Student Information Card was utilized to compile pupil data. At the beginning of each school year, a Student Information Card is provided to each student enrolled in a Frederick County Public School. The Student Information Card asks for the following information: the student's address, parent/guardian, childcare, special health needs, emergency contact, and dwelling type. The dwelling type choices include: single-family house, townhouse, or multi family dwelling. The Student Information Card is completed by a parent or guardian and returned to the student's school in September. Administrative staff at each school was responsible for entering the data from the cards into the student data system.

With the improved process the student survey data was matched to account for 100% of the student population.

### **Housing Unit Inventory**

One advantage of the new methodology was that it accounted for the correct dwelling type since is not uncommon that the parent would have marked that they live in a single-family detached even if they lived in a townhouse. The Frederick County housing unit inventory includes all housing units in the county with the exception of dwellings in the Frederick City prior to 2010. Each housing unit record in the inventory had an address and a housing unit type (single family, townhouse, multi-family). Since 2005, the housing unit inventory has been updated with data from residential permits, address lists and aerial photography. To improve the housing unit data quality a second source, Maryland Department of Assessments and Taxation (SDAT) records, was also used to inventory and classify housing unit types.

In order to update the 2012 housing unit inventory for Frederick City, the 2012 U.S. Census American Community Survey (ACS) data, SDAT were used.

Totals for each housing unit type for each school district were generated by the County's Geographic Information system (GIS) applications. Housing units that were within the boundaries of each elementary, middle, and high school district were selected. The



housing unit types were queried, and totals calculated yielding the housing units, by type in each school district.

Totals for pupils by each housing unit type for each school district were generated with the County's GIS applications. The pupil addresses and grade data from the student information cards were merged with the housing unit inventory. This produced a data set of geo-located points, each one representing a pupil, grade level, and dwelling type. Next, the pupil points were assigned to their respective elementary, middle and high school district. The housing unit types were queried and totals calculated which provided the total of pupils by housing unit type for each school district.

### **Pupil Yield Factors**

Based on the three housing unit types there are three pupil yield factors calculated for each school district. Each factor is calculated (per unit type and district) as the total number of pupils divided by the total number of housing units. Cumulative results indicate factors for each school level as well as for the housing unit types.

## **2012 PUPIL YIELD RATES**

When the pupil yield rates are applied to a development project a common reaction has been that the total number of students generated from the build out of the development is too low. It is often cited that each home in a given development would generate 2, 3, or more students with the view that an overall average pupil yield rate of 0.44 students/dwelling is much lower than what is observed in new developments.

However, the basic methodology for determining pupil yield rates must reflect the number of students within the development compared to the total number of dwellings in that development. The use of the total number of dwellings is necessary to provide a true average pupil yield rate since every new home that is built does not generate school aged children.

The table below indicates the countywide pupil yield rates resulting from the 2012 Study. A summary of the pupil yield rates by school district and dwelling type is included in the Appendix of this report. The table below is broken down to depict the number of public school students generated by different types of housing units. For the purposes of this study, single-family detached dwellings include mobile homes; Townhouse dwellings and duplex dwellings grouped together; and multi-family dwellings include condominiums and apartment (rental) units. This study also updated the pupil yield rate for two-over two dwellings.

## 2012 Pupil Yield Rates – Countywide Averages

Dwelling Type	Elementary	Middle	High	All Grades
Single Family Detached	.211	.112	.164	.488
Townhouse	.265	.099	.128	.492
Two-over-Two	.13	.05	.06	.24
Multi-Family	.116	.038	.051	.205

### Data Anomalies

With the new methodology that is able to exactly match the dwelling type with the number of students at that specific residence the inconsistencies caused by respondents marking the incorrect dwelling type on the survey are avoided. However, one anomaly that needed to be addressed was the instance where few if any townhouse or multi-family dwelling types existed in a particular school district. This is the case for the more rural school districts that typically will only have single-family dwellings so the pupil yield rates for townhouses and multi-family will be 0.0 or if there are only a small number of such dwellings then the resulting rate is very high. In these instances the countywide average for townhouses and multi-family for the particular grade level would be used for an APFO test.

While not necessarily showing up in the data as an anomaly it should be noted that a relatively small number of school age children are not accounted for in their home school districts. These students may attend one of the charter schools, attend an out of district school, or attend a school in another county.

### Current and Past Pupil Yield Rates

<b>Dwelling Type</b>	<b>Survey Year</b>	<b>Elementary</b>	<b>Middle</b>	<b>High</b>	<b>All Grades</b>
<b>Single Family Detached</b>	<b>1998</b>	.23	.14	.18	.56
	<b>2005</b>	.24	.13	.18	.56
	<b>2007</b>	.23	.13	.18	.54
	<b>2012</b>	.211	.112	.164	.488
<b>Townhouse</b>	<b>1998</b>	.20	.08	.09	.37
	<b>2005</b>	.24	.10	.13	.47
	<b>2007</b>	.24	.10	.13	.47
	<b>2012</b>	.265	.099	.128	.492
<b>Multi-Family</b>	<b>1998</b>	.06	.02	.02	.10
	<b>2005</b>	.05	.02	.02	.09
	<b>2007</b>	.05	.02	.02	.09
	<b>2012</b>	.116	.038	.051	.205
<b>All Dwellings</b>	<b>1998</b>	.20	.11	.14	.45
	<b>2005</b>	.21	.11	.15	.48
	<b>2007</b>	.21	.11	.15	.46
	<b>2012</b>	.206	.097	.139	.442

## **CONCLUSIONS AND NEXT STEPS**

The most significant change from the 2007 study was for multi-family dwellings, which experienced an increase in the rates across all three school levels. The total rate for 2012 (.213) was slightly more than double the 2007 rate (.09). This is likely due to effects from the recession and housing bubble, which caused families to either stay in a multi-family dwelling as their children reach school age or to down size into a multi-family dwelling from a single-family house or townhouse for economic reasons.

These conditions may also account for the slight decrease in the rate for single-family detached dwellings and a very slight increase the townhouse rate.

### **Next Steps and Recommendations**

At the time the previous pupil yield study was conducted in 2007 the county had a number of approved age-restricted housing projects. Over the past several years all of these projects have been revised to remove their age-restriction status and are now expected to be developed as conventional all-age projects. Only one project, Monrovia Town Center PUD, is still required to develop at least 50% of the project as age-restricted. While there may no longer be a concern about how to count age-restricted dwelling units in future pupil yield studies staff will still need to be aware of these projects and how they should be addressed. The current Adequate Public Facilities Ordinance (APFO) does not require age-restricted developments to be tested for school adequacy.

The County and Frederick County Public School staff will continue to track the pupil generation from two-over-two dwelling units in an effort to assess whether this type of unit should continue to have its own pupil generation category rather than being grouped with the multi-family category. This would affect both the APFO testing and any consideration to have two-over-two's included as a unique dwelling type for impact fees and/or school construction fees.

Following the 2005 pupil yield study it was expected to update this study on a 2-year cycle. However, given the very small changes in the pupil yield rates since 2005 it is recommended that the pupil yield study be updated every 5 years unless there is a significant demographic shift or a change in housing construction trends that would warrant a new study. While this 2012 study is being released in 2014 it is recommended that the next study occur in the fall 2017.

## **APPENDIX**

- 2012 Pupil Yield Rates by School District

**2012 Pupil Yield Rates (effective November 2014)  
Frederick County Public Schools**

<b>Elementary Schools</b>	<b>Single-Family</b>	<b>Townhouse</b>	<b>Multi-Family</b>	<b>Total</b>
Ballenger Creek ES	0.20	0.24	0.14	0.20
Brunswick ES	0.24	0.28	0.14	0.23
Carroll Manor ES	0.26	0.08	0.12	0.24
Centerville ES	0.53	0.35	0.12	0.47
Deer Crossing ES	0.33	0.23	0.20	0.31
Emmitsburg ES	0.17	0.15	0.20	0.17
Glade ES	0.24	0.33	0.07	0.24
Green Valley ES	0.18	0.27	0.12	0.18
Hillcrest ES	0.25	0.38	0.28	0.31
Kemptown ES	0.23	0.27	0.33	0.24
Lewistown ES	0.16	0.27	0.13	0.16
Liberty ES	0.16	0.40	0.04	0.15
Lincoln ES	0.16	0.23	0.06	0.14
Middletown ES and PS Total	0.21	0.24	0.12	0.20
Monocacy ES	0.14	0.32	0.21	0.22
Myersville ES	0.18	0.33	0.32	0.18
New Market ES	0.26	0.24	0.50	0.26
New Midway/Woodsboro ES	0.17	0.27	0.14	0.17
North Frederick ES	0.19	0.15	0.06	0.13
Oakdale ES	0.26	0.22	0.12	0.25
Orchard Grove ES	0.20	0.29	0.08	0.19
Parkway ES	0.15	0.14	0.02	0.10
Sabillasville ES	0.13	0.27	0.13	0.14
Spring Ridge ES	0.19	0.22	0.03	0.14
Thurmont ES and PS Total	0.18	0.26	0.10	0.18
Tuscarora ES	0.22	0.33	0.10	0.24
Twin Ridge ES	0.22	0.27	0.50	0.22
Urbana ES	0.27	0.39	0.38	0.29
Valley ES	0.18	0.16	0.10	0.17
Walkersville ES	0.17	0.19	0.04	0.16
Waverly ES	0.20	0.17	0.27	0.23
Whittier ES	0.30	0.54	0.08	0.29
Wolfsville ES	0.15	0.27	0.10	0.15
Yellow Spring ES	0.17	0.06	0.12	0.15
<b>Countywide Average</b>	<b>0.211</b>	<b>0.265</b>	<b>0.116</b>	<b>0.206</b>

<b>Middle Schools</b>	<b>Single-Family</b>	<b>Townhouse</b>	<b>Multi-Family</b>	<b>Total</b>
Ballenger Creek MS	0.14	0.11	0.02	0.10
Brunswick MS	0.10	0.09	0.03	0.09
Crestwood MS	0.09	0.09	0.04	0.08
Gov TJ MS	0.09	0.09	0.02	0.07
Middletown MS	0.11	0.09	0.06	0.11
Monocacy MS	0.09	0.10	0.07	0.08
New Market MS	0.11	0.12	0.03	0.11
Oakdale MS	0.15	0.09	0.06	0.14
Thurmont MS	0.09	0.09	0.04	0.08
Urbana MS	0.20	0.13	0.23	0.18
Walkersville MS	0.10	0.09	0.02	0.09
West Frederick MS	0.10	0.11	0.04	0.08
Winsor Knolls MS	0.14	0.10	0.03	0.13
<b>Countywide Average</b>	<b>0.112</b>	<b>0.099</b>	<b>0.038</b>	<b>0.097</b>

**2012 Pupil Yield Rates (effective November 2014)  
Frederick County Public Schools**

<b>High Schools</b>	<b>Single-Family</b>	<b>Townhouse</b>	<b>Multi-Family</b>	<b>Total</b>
Brunswick HS	0.14	0.12	0.06	0.13
Catoctin HS	0.14	0.15	0.04	0.13
Frederick HS	0.16	0.15	0.05	0.12
Gov TJ HS	0.12	0.11	0.05	0.10
Linganore HS	0.18	0.13	0.08	0.18
Middletown HS	0.17	0.15	0.09	0.17
Oakdale HS	0.22	0.13	0.03	0.19
Tuscarora HS	0.17	0.13	0.05	0.13
Urbana HS	0.21	0.14	0.78	0.21
Walkersville HS	0.15	0.10	0.03	0.12
<b>Countywide Average</b>	<b>0.164</b>	<b>0.128</b>	<b>0.051</b>	<b>0.139</b>
<b>Countywide Average for all Schools</b>	<b>0.488</b>	<b>0.491</b>	<b>0.205</b>	<b>0.442</b>
<b>2 Over 2 Dwellings</b>	<b>Elementary 0.13</b>	<b>Middle 0.05</b>	<b>High 0.06</b>	<b>0.08</b>