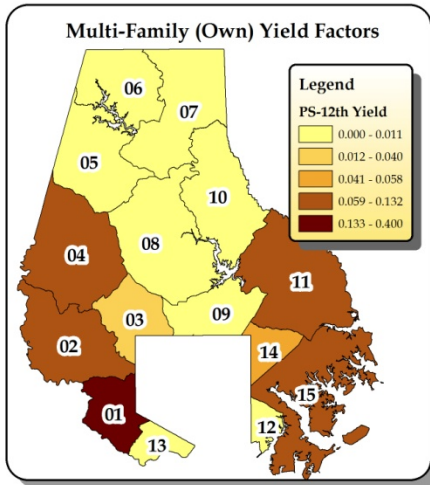
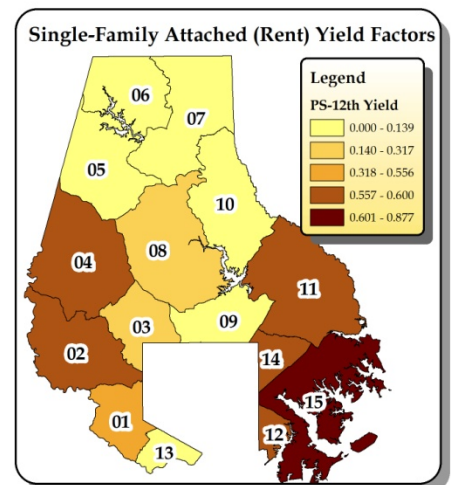
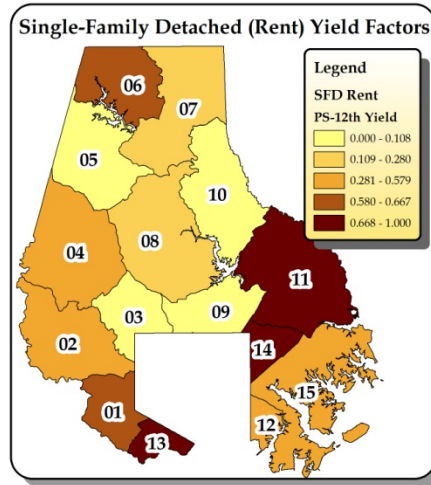
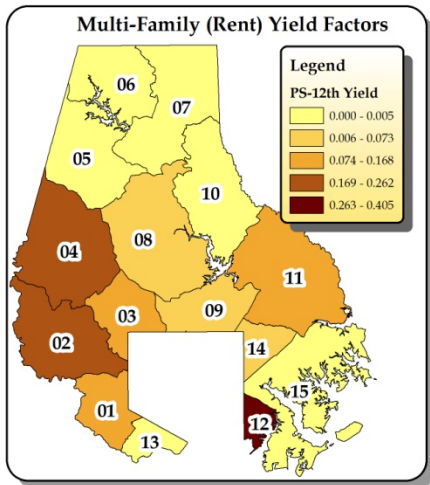
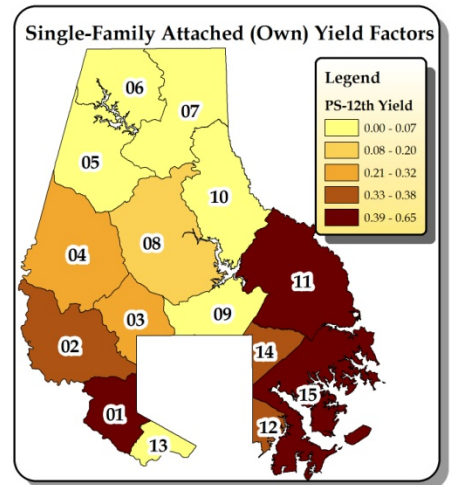
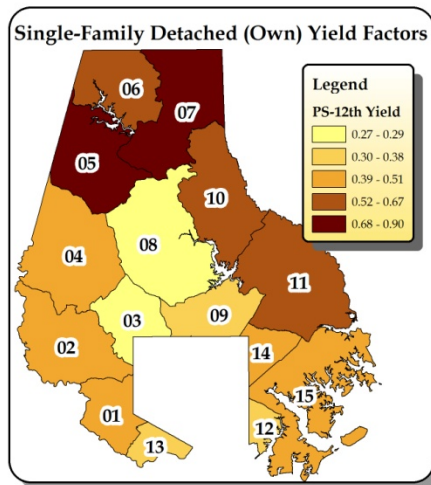


Baltimore County Public Schools Pupil Yield Study 2016

Revised December 2, 2016



Baltimore County Pupil Yield Factors by Election District



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PREFACE:

School districts are continually faced with the challenge of providing an adequate number of schools to accommodate growth in student population. Along with this comes the challenge of determining the number of facilities needed, identifying and purchasing preferred sites, and having sufficient capital and operating funds for the facilities. On the other hand, some districts need to plan for the utilization of space if enrollments decline.

Both scenarios require having accurate enrollment projections: one to accommodate growth; and the other to allow the district to make decisions that could include a reduction in the number of schools and staff, and could necessitate boundary changes, etc. Both should be thoroughly researched, documented, and presented to all stakeholders. School districts must look closely at the demographics of the city, township, or county that they serve. The houses in these communities hold the key to the current and future enrollment of the school district, and the challenge then is to determine how many students live in each house, and how many will live in houses that are still in the planning or development stage. In other words: *what is the pupil yield factor?*

BALTIMORE COUNTY PUBLIC SCHOOLS 2016 PUPIL YIELD FACTOR METHODOLOGY

To develop a *Pupil Yields Factor* that describes the number of pupils that will come from post-1995 developments, Baltimore County Public Schools used three comprehensive databases to obtain base information: the *Baltimore County (BC) Parcel Data, BC Address Points, and BCPS Student Enrollment Information*. The County Parcel and Address Point data provided valuable housing unit information such as development information, housing type, and whether each housing unit is owned or rented. Using GIS as the primary tool it was possible to combine the Parcels and Address Point GIS data to determine how many housing units exist per development. The past Pupil Yield Studies in 2004 and 2009 that were performed by BCPS used development data produced by Baltimore County's *SLIST*. This data was not used in the creation of this study due to data inconsistencies that existed, including areas that under represented the number of housing units that exist.

In order to develop the pupil yields for Baltimore County Public Schools, every viable development and its pertinent type throughout the County was researched. Once developments along with their housing unit counts were accounted for, they were given attributes as to which Election District each one fell within. This gave a total number of developments and units in each Election District for each housing type (Multi-Family Owned, Multi-Family Rented, Single-Family Attached Owned, Single-Family Attached Rented, and Single-Family Detached). The following is a description of each classification and an example of housing that falls within the type:

1. "Multi-Family Owned" property included all developments that were classified as multi-family but had individual ownership. An example of this might be a high-rise condominium development.
2. "Multi-Family Rented" property consists of housing developments that were rented. An example of this is apartment complexes.
3. "Single-Family Attached Owned" property consists of all developments that are classified as single-family, but might have attached garages or buildings. Many condominium developments that are individually owned have attached garages or the buildings are attached.
4. "Single-Family Attached Rented" would have the same definition as item #3 but the occupied persons rent the property as opposed to owning it.
5. "Single-Family Detached Owned" are all properties that sit as an individual property on a land parcel and are owned. These are the most common classifications for individual houses.
6. "Single-Family Detached Rented" are all properties that sit as an individual property on a land parcel and were being rented at the time of this study's creation.

Certain developments were excluded from the new development analysis. These were:

- o Very old developments (i.e., ones which contained households prior to 1995)
- o Developments which contained no pupils at all in any of the three years.

Once the developments were selected and aggregated into Election Districts, student averages from 2013-2015 were generated for Election District. These student averages were classified as PS-5th, 6-8th, 9-12th, and PS-12th. Pupil yields per Election District were calculated by dividing the average number of students from 2013-2015 with the number of housing units.

2016 PUPIL YIELD STUDY FINDINGS FROM NEWER DEVELOPMENTS

The following tables reflect the findings as a result of the 2016 yield study analysis, along with the housing and student information that were used to develop the yield factors. The purpose of these tables is to show the pupil yields from newer developments within Baltimore County. These tables show the yields from developments that were built between 1995 to 2015.

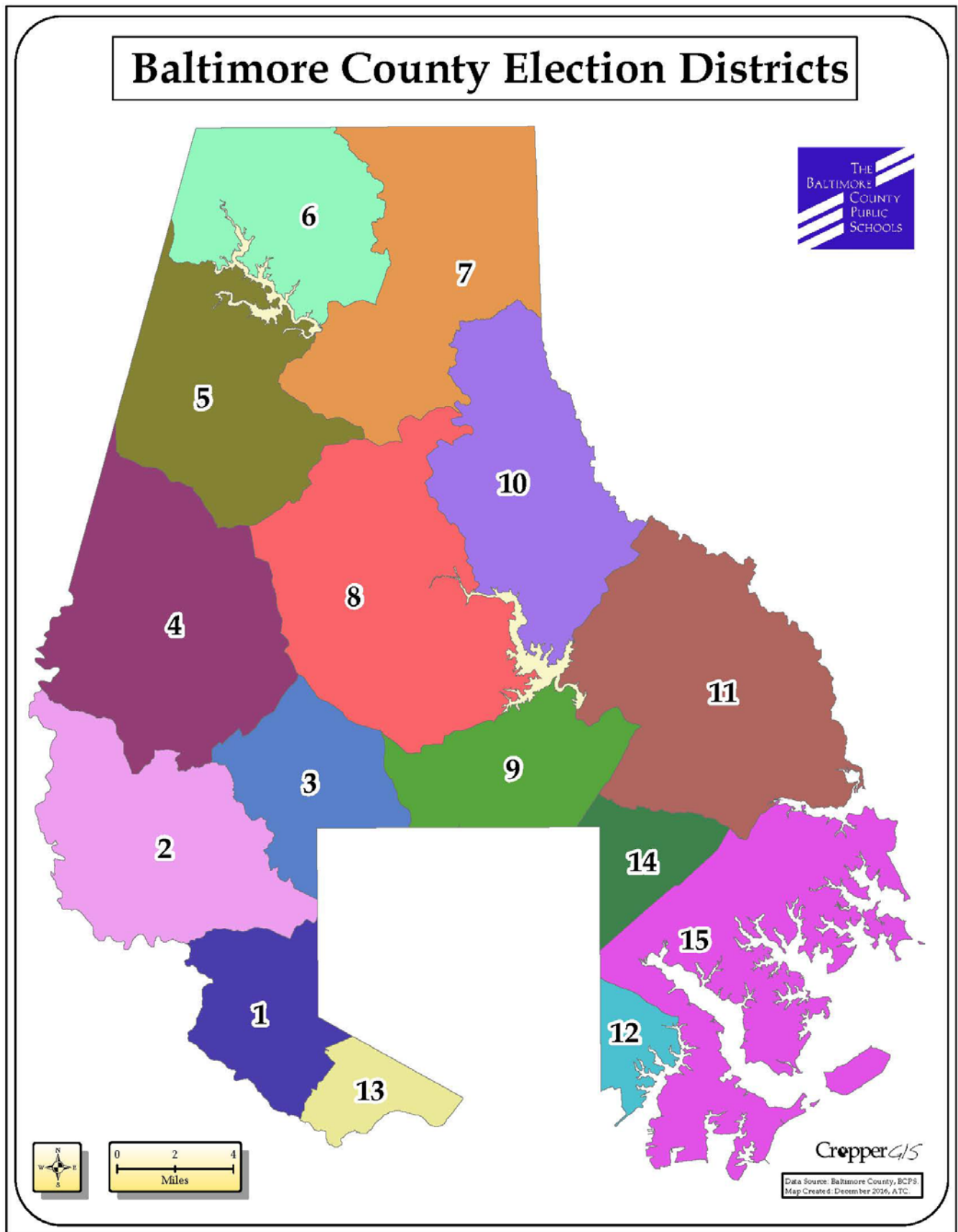
1995 to 2015 Developments

Identity			Developments		Pupil Averages, 2013-2015				Yields			
District	Type	Tenure	Count	Built Units	PS-5th Grades	6-8th Grades	9-12th Grades	PS-12th Grades	PS-5th Grades	6-8th Grades	9-12th Grades	PS-12th Grades
1	MF	Own	2	55	11.33	5.33	5.33	22.00	0.206	0.097	0.097	0.400
		Rent	3	268	31.33	4.67	8.33	44.33	0.117	0.017	0.031	0.165
	SFA	Own	4	329	87.33	41.33	45.67	174.33	0.265	0.126	0.139	0.530
		Rent	4	69	18.67	11.00	8.67	38.33	0.271	0.159	0.126	0.556
	SFD	Own	18	428	93.67	45.00	63.33	202.00	0.219	0.105	0.148	0.472
		Rent	8	19	7.67	2.67	2.00	12.33	0.404	0.140	0.105	0.649
2	MF	Own	9	765	42.67	14.67	22.33	79.67	0.056	0.019	0.029	0.104
		Rent	13	3074	422.67	168.67	214.33	805.67	0.137	0.055	0.070	0.262
	SFA	Own	25	2626	506.00	202.00	275.00	983.00	0.193	0.077	0.105	0.374
		Rent	25	818	231.67	108.33	141.67	481.67	0.283	0.132	0.173	0.589
	SFD	Own	52	2337	500.33	223.67	352.67	1076.67	0.214	0.096	0.151	0.461
		Rent	38	154	40.00	15.67	24.00	79.67	0.260	0.102	0.156	0.517
3	MF	Own	3	143	4.67	0.00	1.00	5.67	0.033	0.000	0.007	0.040
		Rent	2	317	19.00	14.00	20.33	53.33	0.060	0.044	0.064	0.168
	SFA	Own	6	244	37.00	15.00	14.33	66.33	0.152	0.061	0.059	0.272
		Rent	5	334	60.00	20.67	25.33	106.00	0.180	0.062	0.076	0.317
	SFD	Own	11	698	142.00	28.00	33.67	203.67	0.203	0.040	0.048	0.292
		Rent	8	31	1.33	0.67	1.33	3.33	0.043	0.022	0.043	0.108
4	MF	Own	5	362	15.00	6.00	11.33	32.33	0.041	0.017	0.031	0.089
		Rent	5	724	76.67	34.00	45.00	155.67	0.106	0.047	0.062	0.215
	SFA	Own	11	1281	229.33	84.00	95.00	408.33	0.179	0.066	0.074	0.319
		Rent	9	341	91.00	44.67	63.67	199.33	0.267	0.131	0.187	0.585
	SFD	Own	43	1312	235.00	167.67	228.67	631.33	0.179	0.128	0.174	0.481
		Rent	30	74	16.67	7.67	17.33	41.67	0.225	0.104	0.234	0.563
5	SFD	Own	1	10	3.33	3.33	1.33	8.00	0.333	0.333	0.133	0.800
6	SFD	Own	9	208	68.33	33.00	37.67	139.00	0.329	0.159	0.181	0.668
		Rent	5	9	2.33	1.67	2.00	6.00	0.259	0.185	0.222	0.667
7	SFD	Own	16	314	125.33	69.00	88.33	282.67	0.399	0.220	0.281	0.900
		Rent	5	9	2.00	0.00	0.00	2.00	0.222	0.000	0.000	0.222
8	MF	Own	8	588	2.00	2.67	2.00	6.67	0.003	0.005	0.003	0.011
		Rent	10	580	7.67	4.67	8.00	20.33	0.013	0.008	0.014	0.035
	SFA	Own	3	163	16.67	6.67	9.00	32.33	0.102	0.041	0.055	0.198
		Rent	3	19	0.67	2.00	3.00	5.67	0.035	0.105	0.158	0.298
	SFD	Own	25	878	120.67	53.67	66.33	240.67	0.137	0.061	0.076	0.274
		Rent	17	31	5.67	2.67	0.33	8.67	0.183	0.086	0.011	0.280
9	MF	Rent	2	806	26.00	12.67	20.00	58.67	0.032	0.016	0.025	0.073
	SFA	Own	3	88	4.67	1.67	0.00	6.33	0.053	0.019	0.000	0.072
		Rent	3	24	3.33	0.00	0.00	3.33	0.139	0.000	0.000	0.139
	SFD	Own	10	153	25.00	11.33	17.00	53.33	0.163	0.074	0.111	0.349

1995 to 2015 Developments

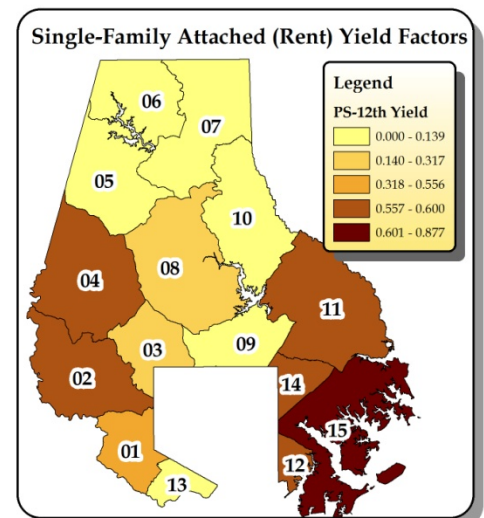
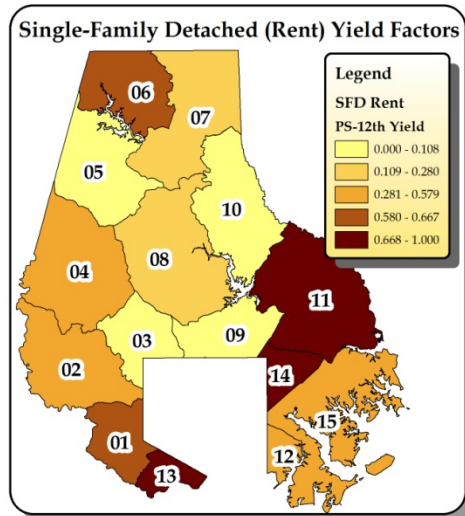
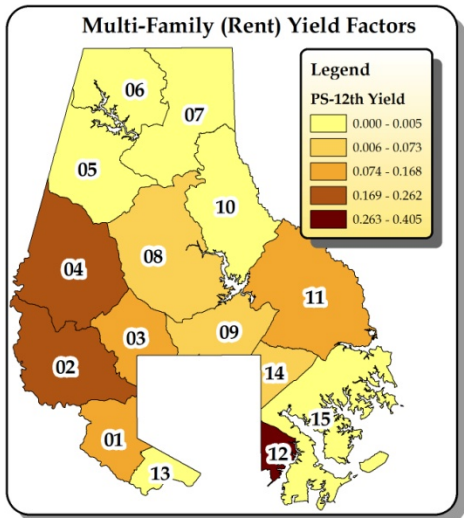
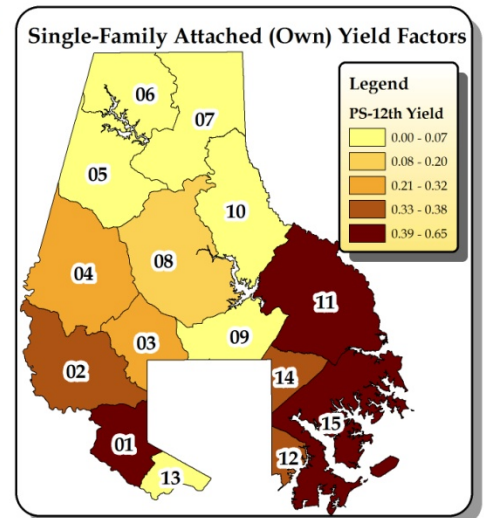
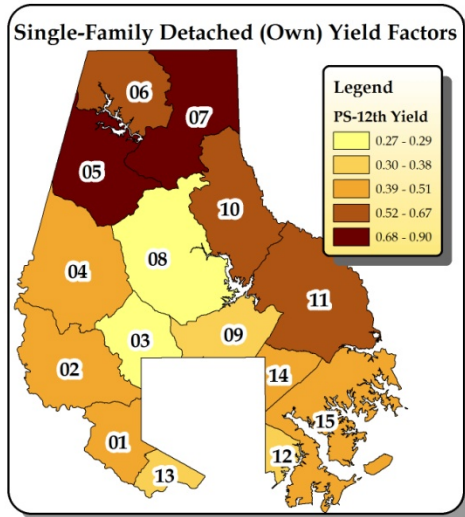
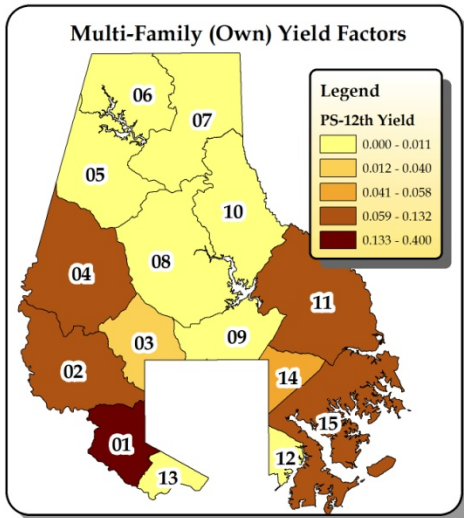
Identity			Developments		Pupil Averages, 2013-2015				Yields			
District	Type	Tenure	Count	Built Units	PS-5th Grades	6-8th Grades	9-12th Grades	PS-12th Grades	PS-5th Grades	6-8th Grades	9-12th Grades	PS-12th Grades
10	SFD	Own	9	161	43.67	24.67	29.00	97.33	0.271	0.153	0.180	0.605
11	MF	Own	4	1251	108.33	27.33	30.00	165.67	0.087	0.022	0.024	0.132
		Rent	4	205	12.33	4.67	9.67	26.67	0.060	0.023	0.047	0.130
	SFA	Own	5	189	70.33	25.67	27.33	123.33	0.372	0.136	0.145	0.653
		Rent	5	25	8.33	3.00	3.67	15.00	0.333	0.120	0.147	0.600
	SFD	Own	54	2023	685.67	277.33	318.33	1281.33	0.339	0.137	0.157	0.633
		Rent	32	78	26.33	16.00	18.67	61.00	0.338	0.205	0.239	0.782
12	MF	Rent	1	504	99.00	44.00	61.33	204.33	0.196	0.087	0.122	0.405
		SFA	Own	3	182	38.00	10.67	21.00	69.67	0.209	0.059	0.115
	Rent		2	23	5.67	3.67	4.33	13.67	0.246	0.159	0.188	0.594
	SFD	Own	3	112	21.67	10.00	11.00	42.67	0.193	0.089	0.098	0.381
		Rent	2	7	0.00	2.33	1.33	3.67	0.000	0.333	0.190	0.524
13	SFD	Own	2	32	5.33	4.00	2.67	12.00	0.167	0.125	0.083	0.375
		Rent	2	6	2.33	2.00	1.67	6.00	0.389	0.333	0.278	1.000
14	MF	Own	4	144	4.67	0.67	3.00	8.33	0.032	0.005	0.021	0.058
		Rent	3	48	0.67	0.00	1.67	2.33	0.014	0.000	0.035	0.049
	SFA	Own	6	656	152.00	41.00	50.00	243.00	0.232	0.063	0.076	0.370
		Rent	6	163	57.67	17.00	20.67	95.33	0.354	0.104	0.127	0.585
	SFD	Own	22	812	174.33	87.33	110.67	372.33	0.215	0.108	0.136	0.459
		Rent	13	49	17.67	9.33	11.33	38.33	0.361	0.190	0.231	0.782
15	MF	Own	1	32	1.00	1.00	1.33	3.33	0.031	0.031	0.042	0.104
		Rent	2	182	0.67	0.00	0.33	1.00	0.004	0.000	0.002	0.005
	SFA	Own	8	791	226.00	79.67	111.00	416.67	0.286	0.101	0.140	0.527
		Rent	7	243	107.67	41.67	63.67	213.00	0.443	0.171	0.262	0.877
	SFD	Own	20	1237	299.33	141.00	192.67	633.00	0.242	0.114	0.156	0.512
		Rent	12	84	18.00	12.67	18.00	48.67	0.214	0.151	0.214	0.579
	MSFD	Rent	1	248	13.00	6.33	10.33	29.67	0.052	0.026	0.042	0.120

The following map reflects the Election Districts in Baltimore County, which is how the pupil yields were reported.



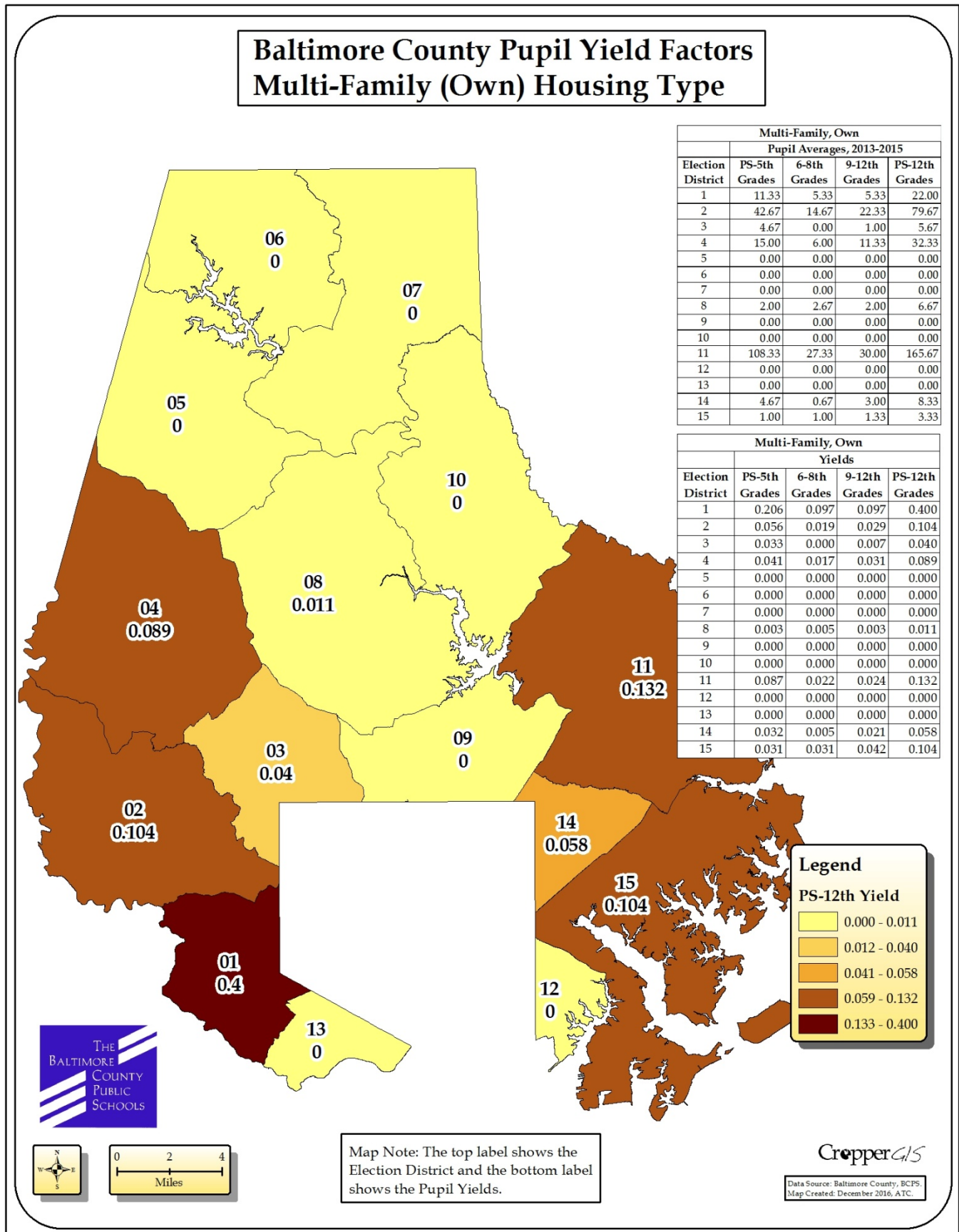
The map below shows the yield factors by housing type for each Election District. The color scale on the map indicates yellow as the lowest pupil yield and dark red as the highest range. The shades between yellow and dark red are the intermediate ranges of pupil yields. This shows the areas of the district that are yielding the most students, and how these areas change based on the housing type that was analyzed. The primary purpose of the color scales is to show the difference in pupil yields from housing throughout the district. The legend in each map should be examined to determine the intensity of pupil yields in various color shaded areas.

**Baltimore County Pupil Yield Factors
by Election District**

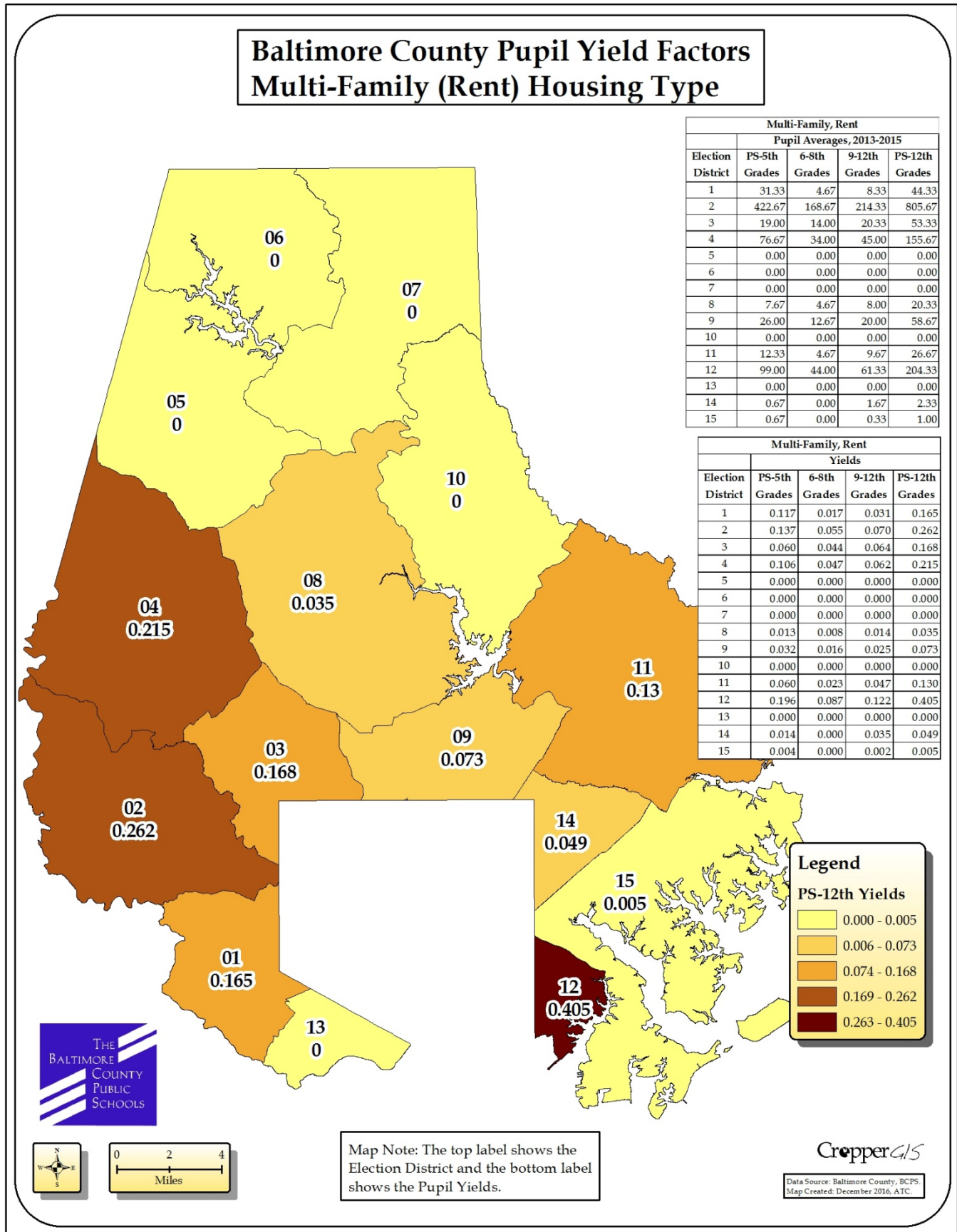


Data Source: Baltimore County, BCPS. Cartographer: ATC, December 2016.

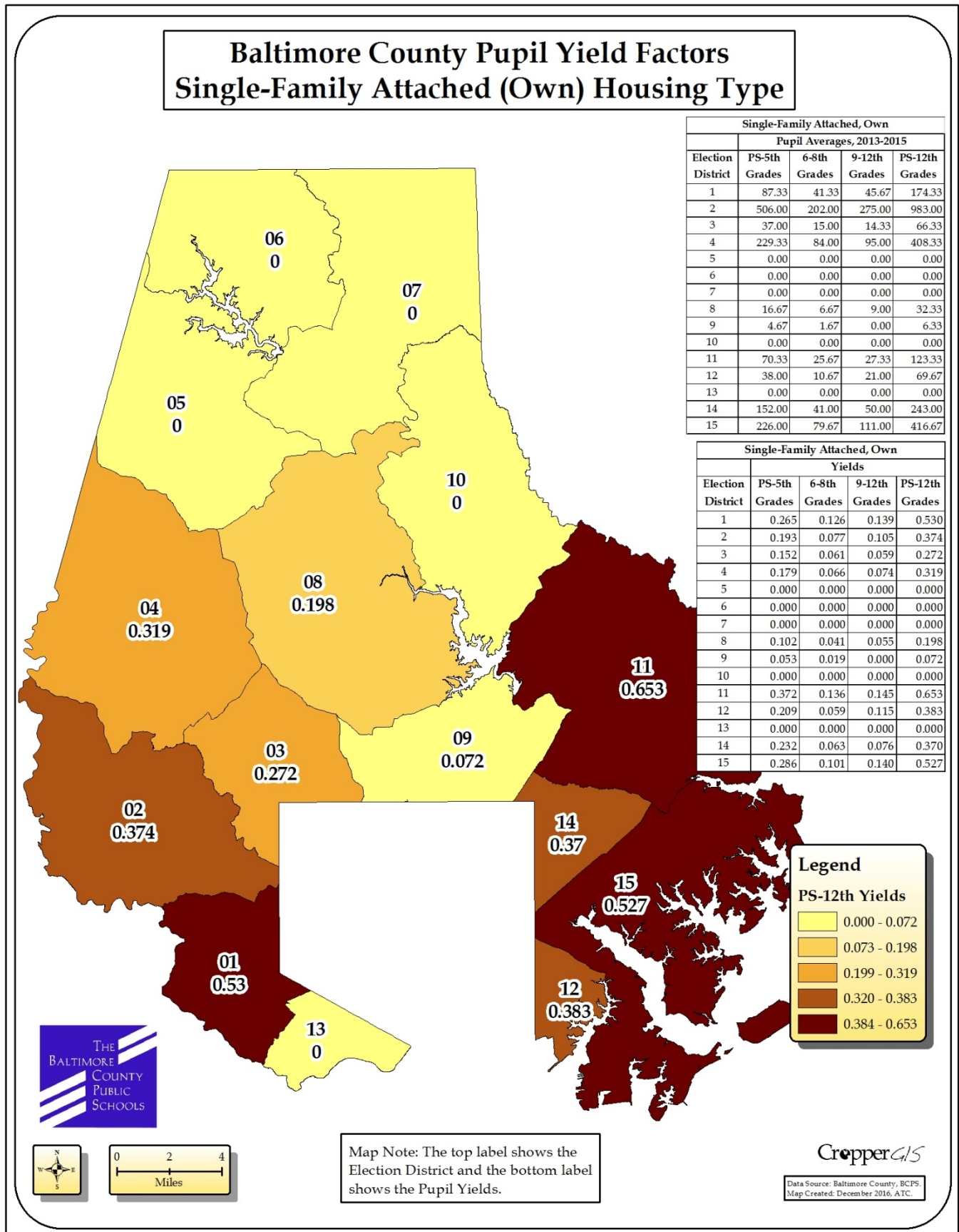
The map below shows the Multi-Family (Own) pupil yields from post 1995 developments for PS-12th.



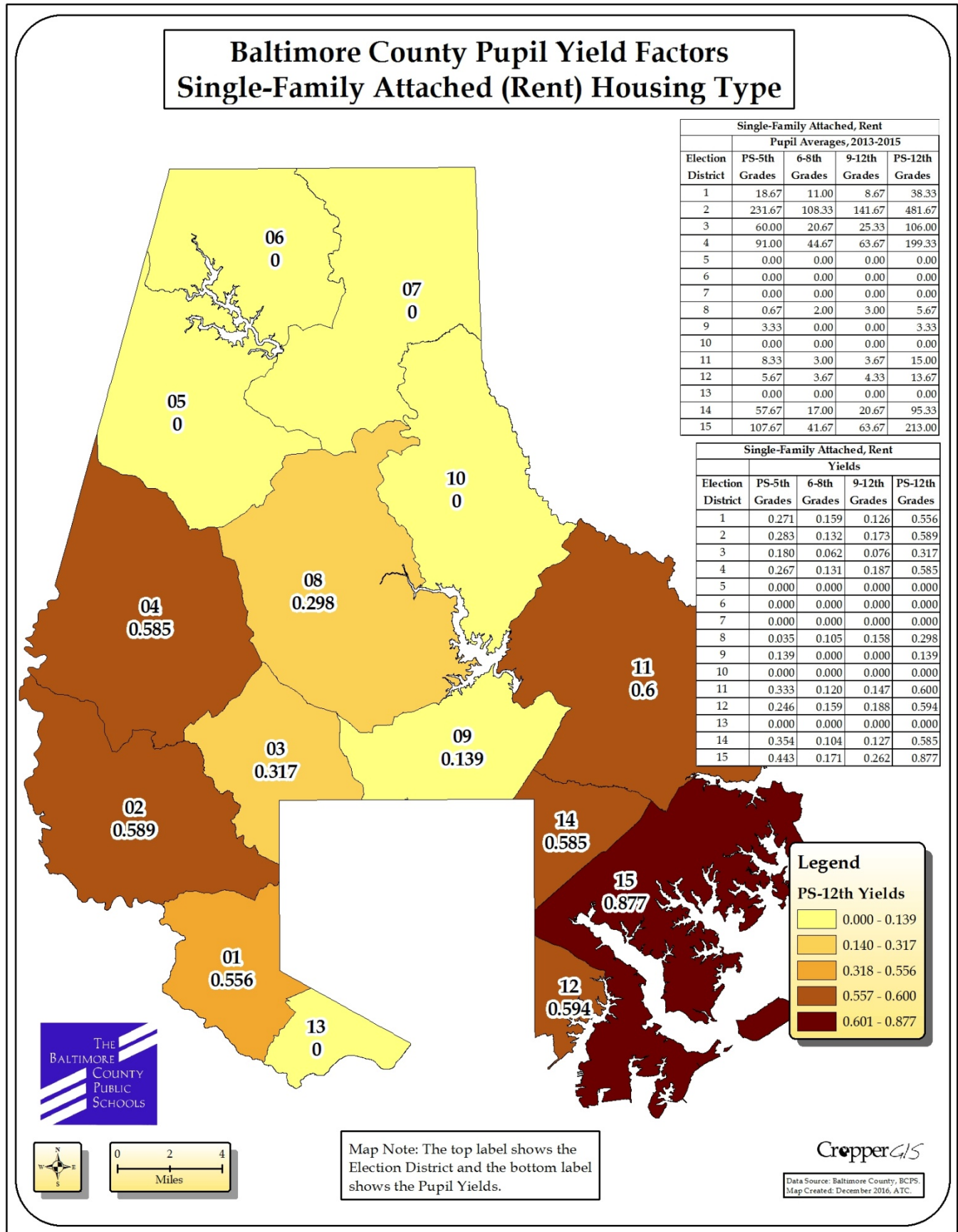
The map below shows the Multi-Family (Rent) pupil yields from post 1995 developments for PS-12th.



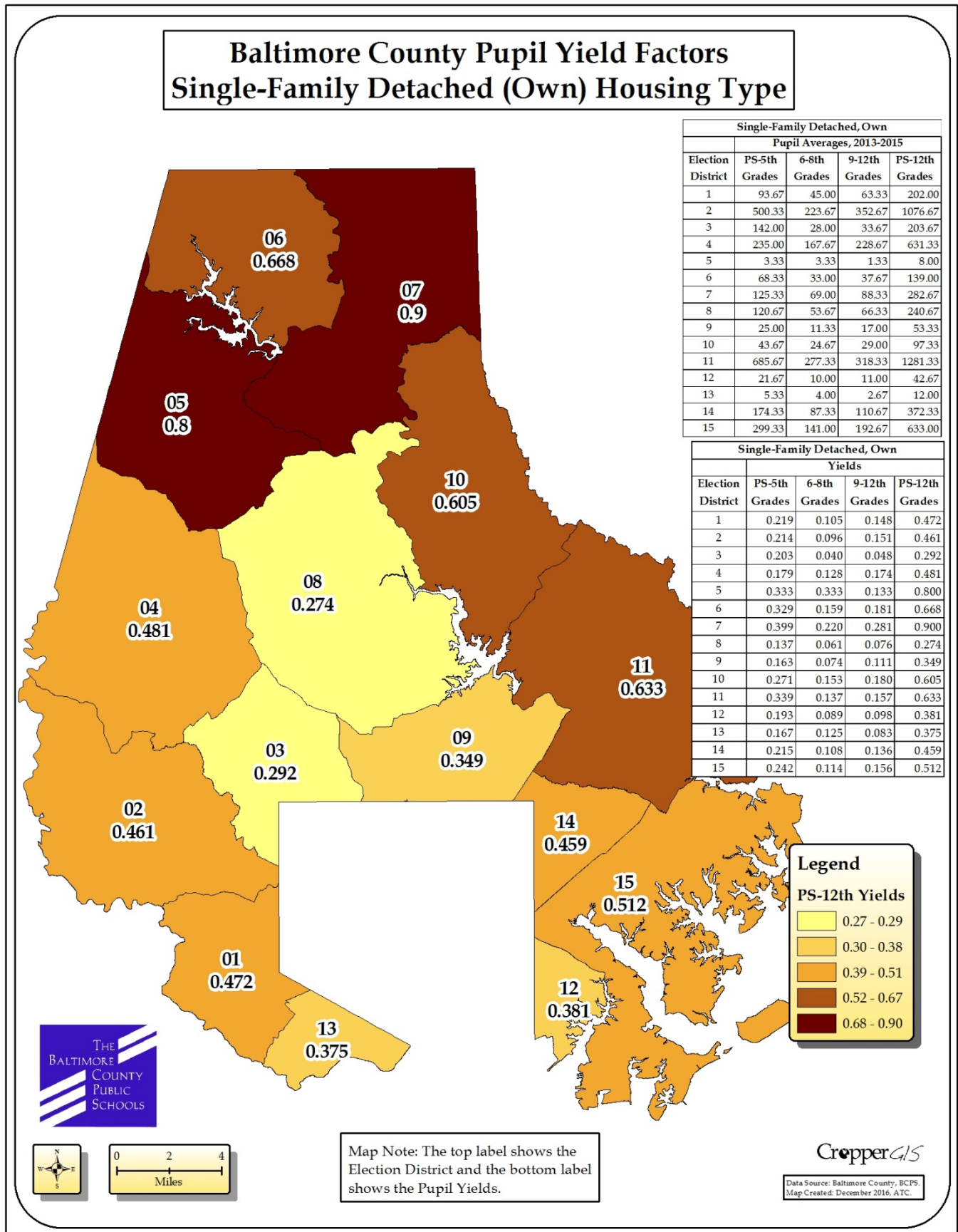
The map below shows the Single-Family Attached (Own) pupil yields from post 1995 developments for PS-12th.



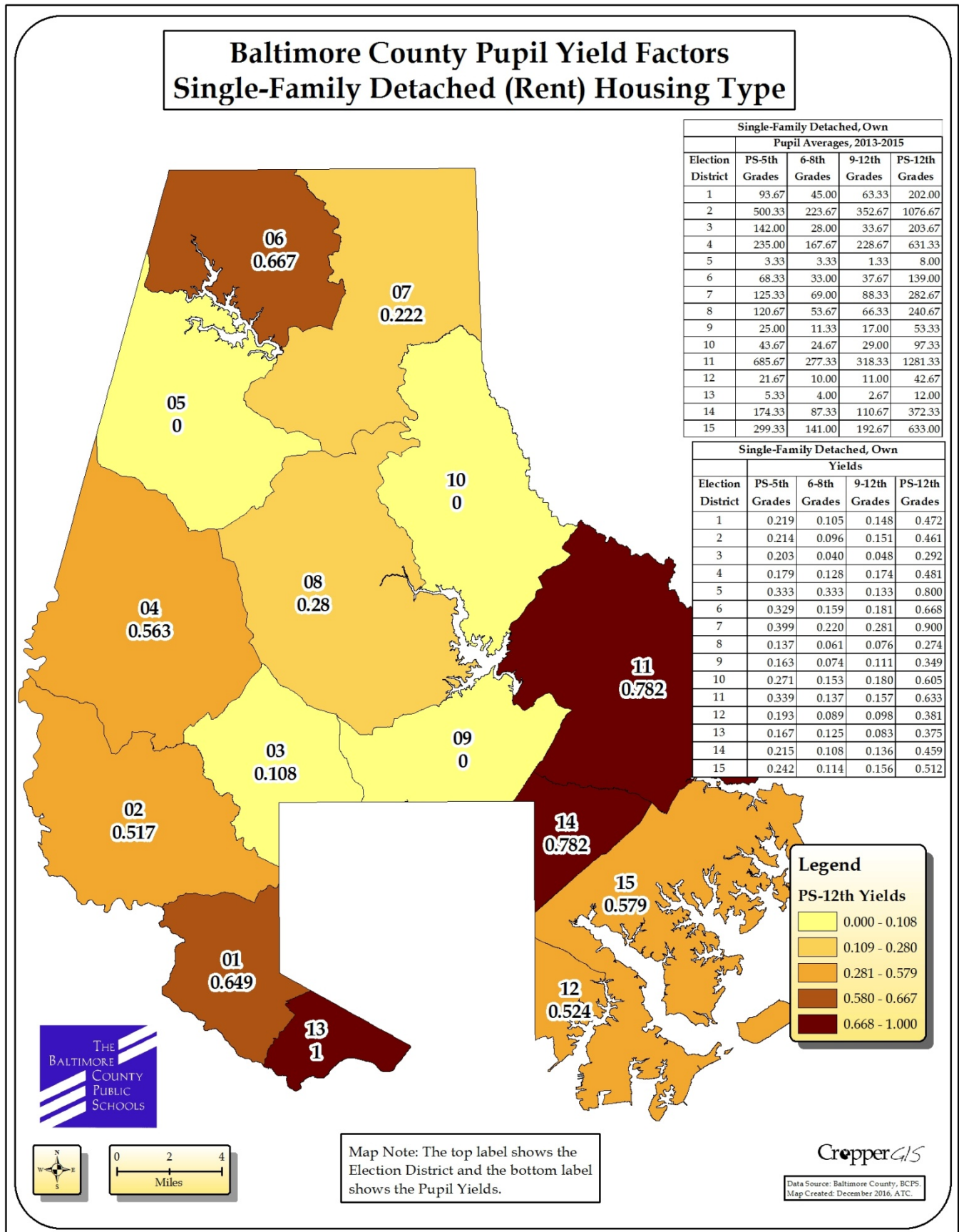
The map below shows the Single-Family Attached (Rent) pupil yields from post 1995 developments for PS-12th.



The map below shows the Single-Family Detached (Own) pupil yields from post 1995 developments for PS-12th.



The map below shows the Single-Family Detached (Rent) pupil yields from post 1995 developments for PS-12th.



CONCLUSION

The northern Election Districts of 5, 6, 7, and 10 have little to no pupil yield in all housing type factors except for Single Family Detached (Own), where these districts show the highest yields (in that category). Both Multi-family categories have the highest yield concentrations on the western side of Baltimore County, with the exception of District 12 on the southeastern side showing a high rate in the Multi-Family (rent) category. The Single Family Attached Rent and Own yield factors generally correspond to election districts 15 and 11, though there are more Districts where the SFA Rent group produce zero yield rates.

The following table describes shows the Election District with the highest yield in each housing type category:

Housing Type	Highest Yield Rate	Election District
Single Family Attached (Own)	0.653	11
Single Family Attached (Rent)	0.877	15
Single Family Detached (Own)	0.9	7
Single Family Detached (Rent)	1	13
Multi-Family (Own)	0.4	1
Multi-Family (Rent)	0.405	12

This study is meant to be used as a planning tool for the Baltimore County Public Schools, in gaining a better understanding of the student populations within the school district.