

-Facility Planning Study-

School Board Update of Process with Current Options

April 14, 2020

CropperGIS

Cropper GIS Consulting, LLC

K-12 school planning is our business and our passion. Our specialty is school redistricting.

Cropper works with K-12 school districts to:

- develop redistricting plans,
- facilitate community engagement,
- research, map and write demographic studies,
- prepare long-range facility master plans,
- author site feasibility studies,
- conduct & publish housing impact and yield factor studies, and
- provide GIS implementation & training.

Who We Are

Cropper GIS is an ESRI Authorized Business Partner



ESRI
Technology
AUTHORIZED
BUSINESS PARTNER

Recent Projects:

- Andover Public Schools, MA
- Public Schools of Brookline, MA
- Framingham Public Schools, MA
- Hamilton Wenham School District, MA
- Needham Public Schools, MA
- Newton Public Schools, MA
- Wayland Public Schools, MA
- Cranston Public School District, RI
- Providence Public Schools, RI
- Hatboro-Horsham School District, PA
- Reading School District, PA
- Baltimore County Schools, MD
- Frederick County Public Schools, MD



Matthew Cropper

- 20 years experience providing GIS mapping and analysis services to school districts and other clients.
- Manages and Facilitates K-12 redistricting and facility planning projects across the U.S.
- Expert consultant for U.S. Department of Justice, Civil Rights Division.
- Published numerous papers about using GIS in master planning and educational planning.

The Westwood Public Schools (district) hired **Cropper GIS Consulting (Cropper)** to assist with student assignment/redistricting planning to incorporate master plan considerations. The following details the scope of services and project approach, so the district can understand the various components of work.

Background:

Following the Master Plan Capital Needs Study (June 2015 by SMMA), the Town of Westwood, MA applied to Massachusetts School Building Authority (MSBA) for funding support for their elementary school needs.

In early 2019, Town of Westwood was invited into the MSBA program for the Hanlon Elementary School project. The town and MSBA has agreed to the following design alternatives which may be evaluated as part of the feasibility study for the Hanlon Elementary School project. Only options 2 and 3 have been explored by **Cropper** because Option 1 would not require any redistricting.

Option 2:

Hanlon ES and Deerfield ES consolidation with an enrollment of 560 students grades K-5
(This option will be located at the current Hanlon site as Deerfield site is not likely to support such large school.)

Option 3:

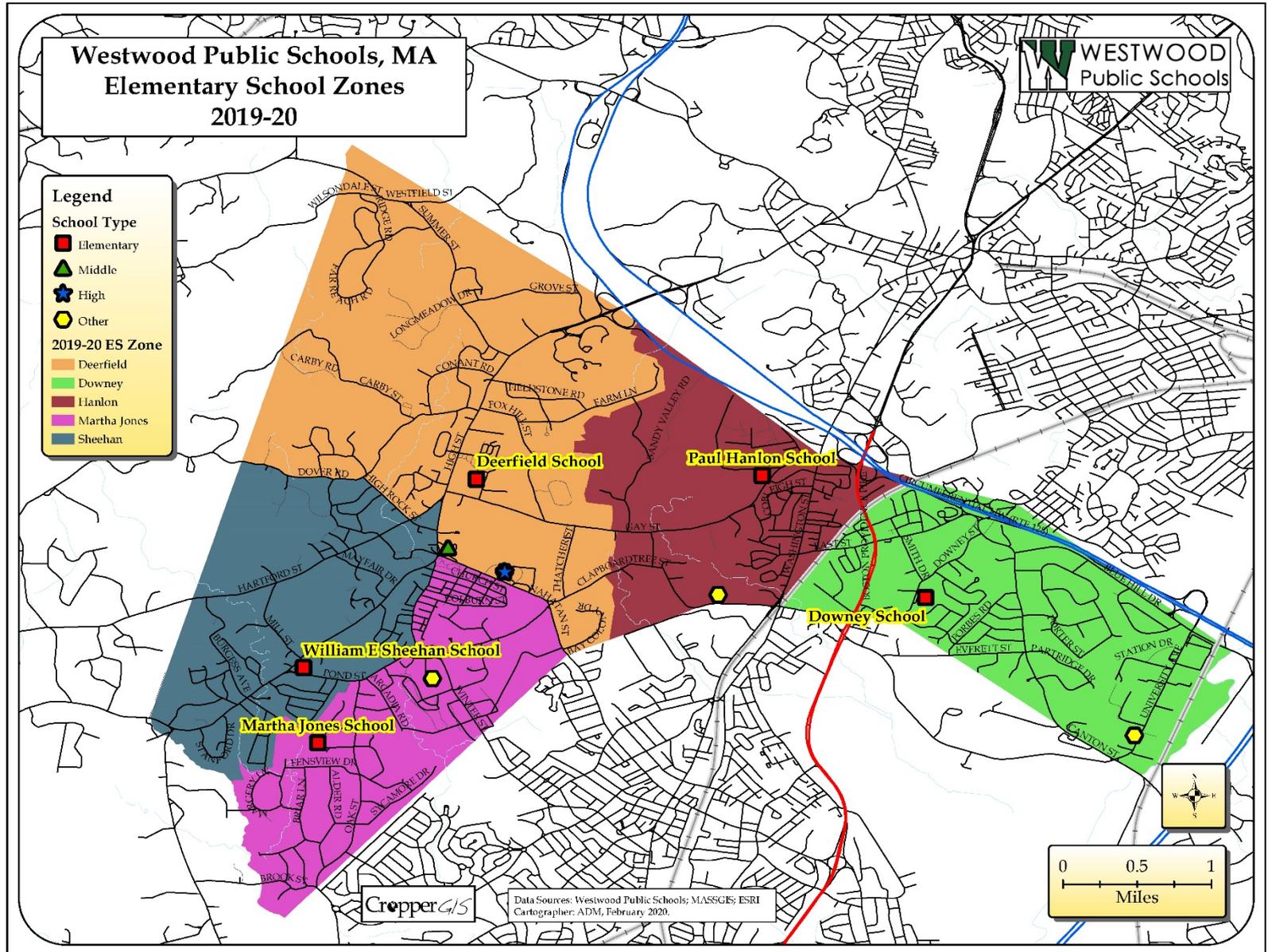
Hanlon ES and Sheehan ES consolidation with an enrollment of 685 students grades K-5

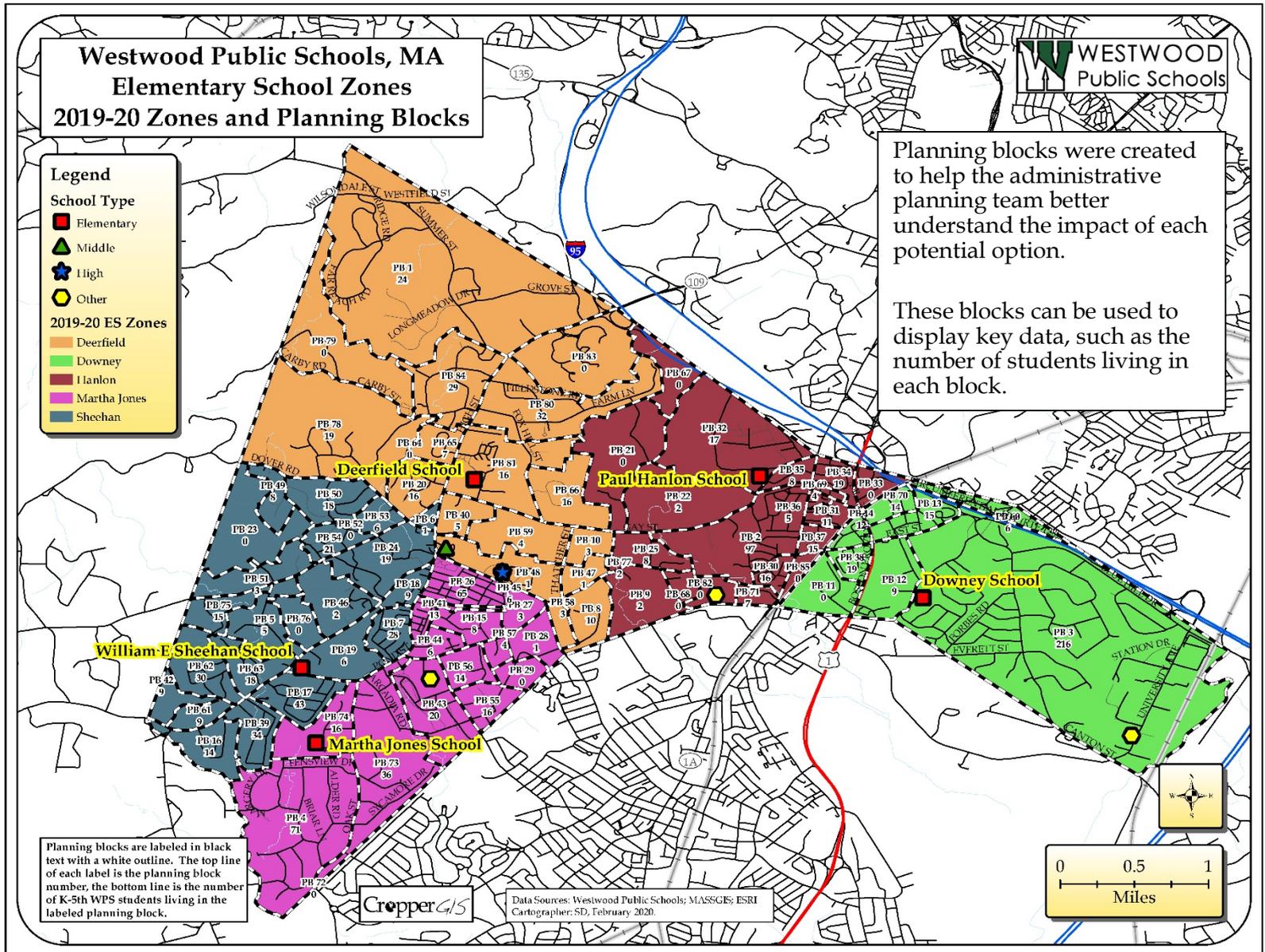
- Option 3a: 685 students at the Hanlon site
- Option 3b: 685 students at the Sheehan site

Since the two sites are on opposite ends of town, the redistricting map may not be the same.

Cropper GIS Consulting was hired by the district to facilitate and manage the project. The project has five parts:

- A. *Data Collection* Collecting important data for the process from various sources, including the school district, county, local municipalities. These sources have provided up-to-date data on school, student, and property information.
- B. *Data Conversion* Converting and integrating data into a Geographic Information System (GIS) for analysis.
- C. *Options Development* Developing options based on the criteria and data.
- D. *Review with Administrators* Reviewing and refining the options with school administrators.
- E. *Presentation or Recommendations* Presenting a final recommendation based on all available sources, including data, local knowledge, and administrator input.





2019-20 ES Enrollment Statistics

ES Name	Grade Config	2020 MSBA Capacity	PK	KF	01	02	03	04	05	2019-20 Total Headcount PK-5 Grade Enrollment	2019-20 PK-5 Enrollment Utilization		K-5 Live and Attend In	K-5 Live Out Attend In	K-5 Unmatched
											+ / -	%			
DEERFIELD SCHOOL	K-5	218	0	28	26	25	33	42	43	197	-21	90%	175	22	
DOWNEY SCHOOL	PK-5	333	2	43	60	49	44	47	43	288	-45	86%	263	23	
MARTHA JONES SCHOOL	K-5	333	0	31	39	54	45	50	49	268	-65	80%	265	2	1
PAUL HANLON SCHOOL	K-5	218	0	28	30	46	31	33	37	205	-13	94%	196	9	
WILLIAM E. SHEEHAN SCHOOL	K-5	356	0	40	58	42	48	55	67	310	-46	87%	291	19	
Total		1,458	2	170	213	216	201	227	239	1,268	-190	87%	1,190	75	1

Counts based on January 2020 Student Enrollment Database

2019-20 MS Enrollment Statistics

MS Name	Grade Config	2020 MSBA Capacity	6	7	8	2019-20 Total Headcount 6-8 Grade Enrollment	2019-20 6-8 Enrollment Utilization		6-8 Live and Attend In	6-8 Live Out Attend In	6-8 Unmatched
							+ / -	%			
EW THURSTON MIDDLE SCHOOL	6-8	759	223	232	251	706	-53	93%	688	17	1
Total		759	223	232	251	706	-53	93%	688	17	1

Counts based on January 2020 Student Enrollment Database

2019-20 HS Enrollment Statistics

HS Name	Grade Config	2020 MSBA Capacity	9	10	11	12	2019-20 Total Headcount 9-12 Grade Enrollment	2019-20 9-12 Enrollment Utilization		9-12 Live and Attend In	9-12 Live Out Attend In	9-12 Unmatched
								+/-	%			
WESTWOOD HIGH SCHOOL	9-12	N/A	257	258	247	236	998	N/A	N/A	967	30	1
Total		0	257	258	247	236	998	N/A	N/A	967	30	1

Counts based on January 2020 Student Enrollment Database

Where K-5 Students Live

Live Attend Matrix:

The table displayed gives details on the schools that students attend and the school zones where they live. The schools of attendance are listed on the left while the zones where students live are listed on the top line. The numbers highlighted in green are counts of students who attend the assigned schools for the zones where they live.

		Where K-5 Students Live							
		Deerfield	Downey	Martha Jones	Hanlon	Sheehan	Out of District	Unmatched	Live Out, Attend In (K-5)
		186	291	279	213	298	1	1	75
Where K-5 Students Attend	DEERFIELD SCHOOL	197	175	15	2	4	1		22
	DOWNEY SCHOOL	286	4	263	3	9	6	1	23
	MARTHA JONES SCHOOL	268	2		265			1	2
	PAUL HANLON SCHOOL	205		9		196			9
	WILLIAM E. SHEEHAN SCHOOL	310	5	3	7	4	291		19
	ATTEND OUT OF DISTRICT	3		1	2				
	Live In, Attend Out (K-5)	77	11	28	14	17	7		

2019-20 MS Live-Attend Matrix

Where 6-8 Students Live

Where 6-8
Students
Attend

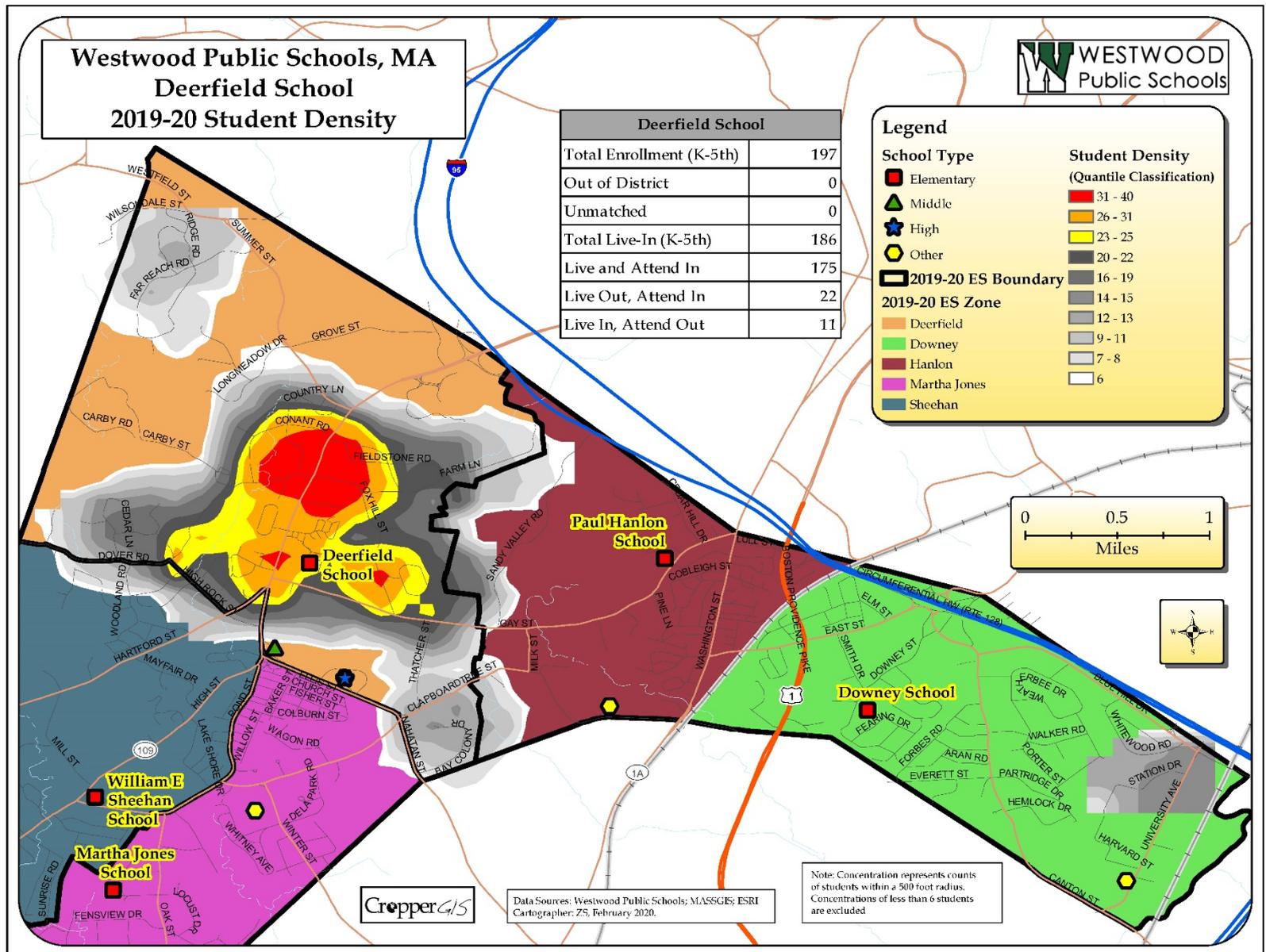
		Where 6-8 Students Live			
		EW THURSTON MIDDLE SCHOOL	Out of District	Unmatched	Live Out, Attend In (6-8)
EW THURSTON MIDDLE SCHOOL	706	689	17	1	17
ATTEND OUT OF DISTRICT	1	1			
Live In, Attend Out (6-8)	1	1			

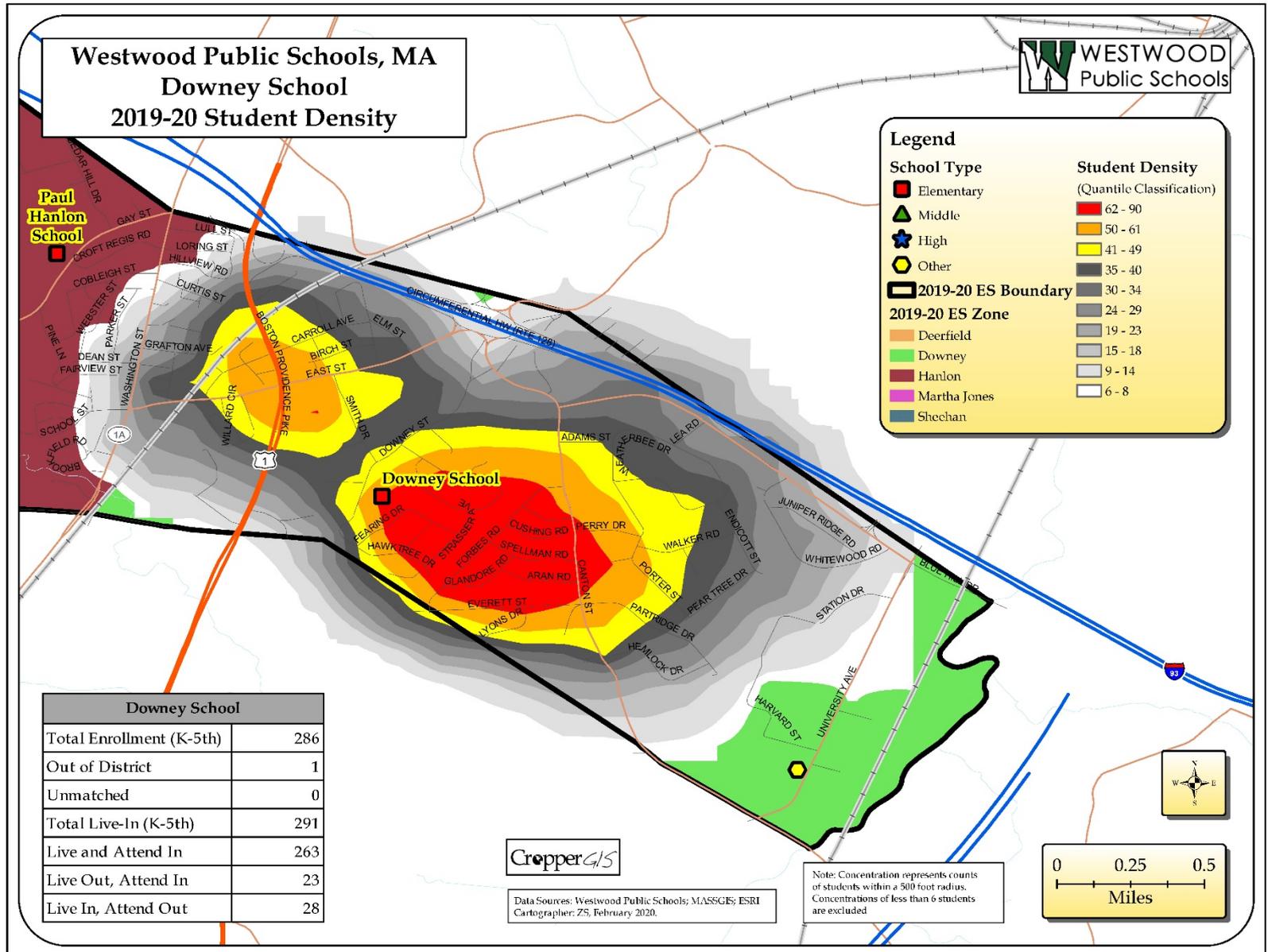
2019-20 HS Live-Attend Matrix

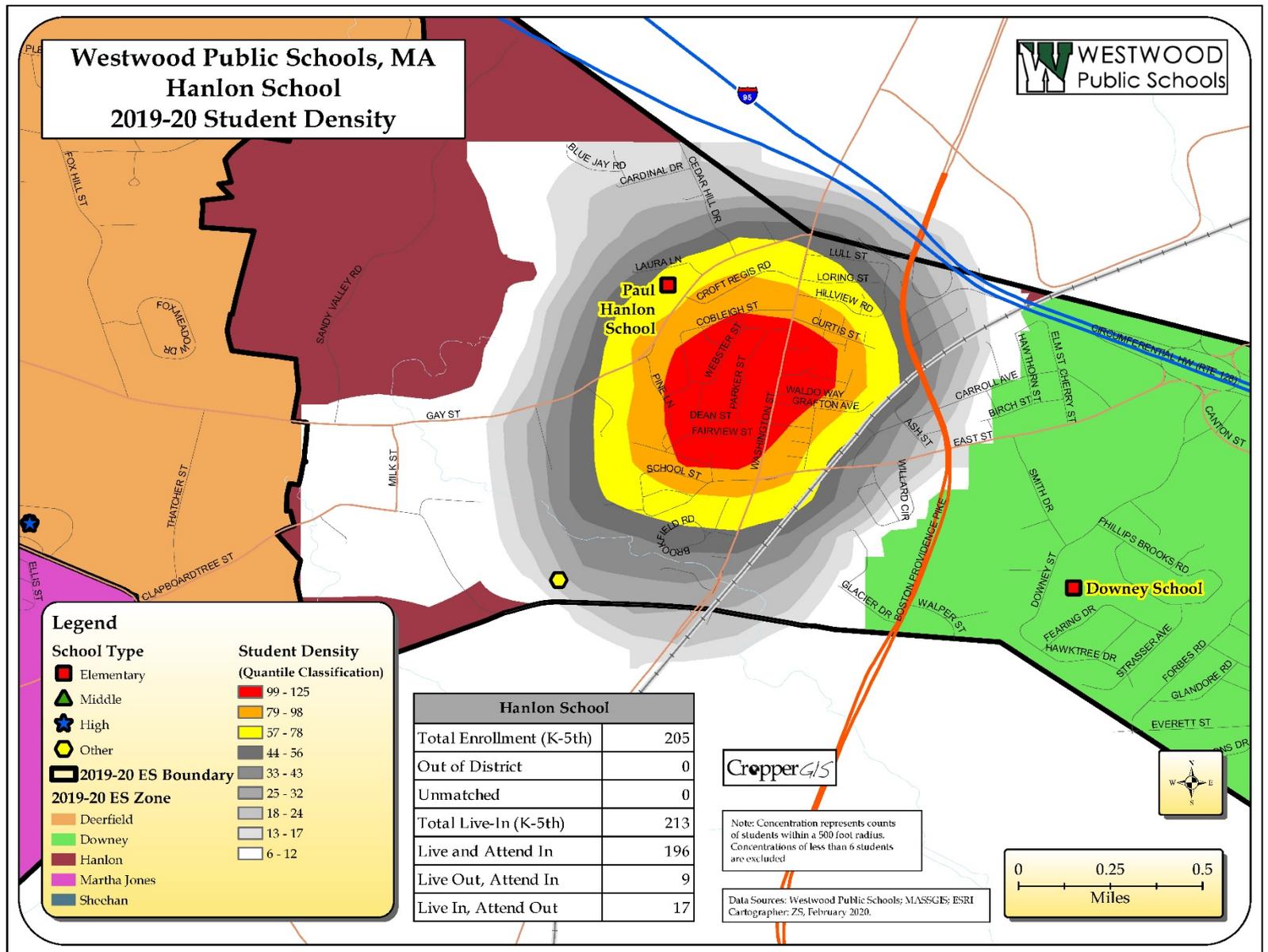
Where 9-12
Students

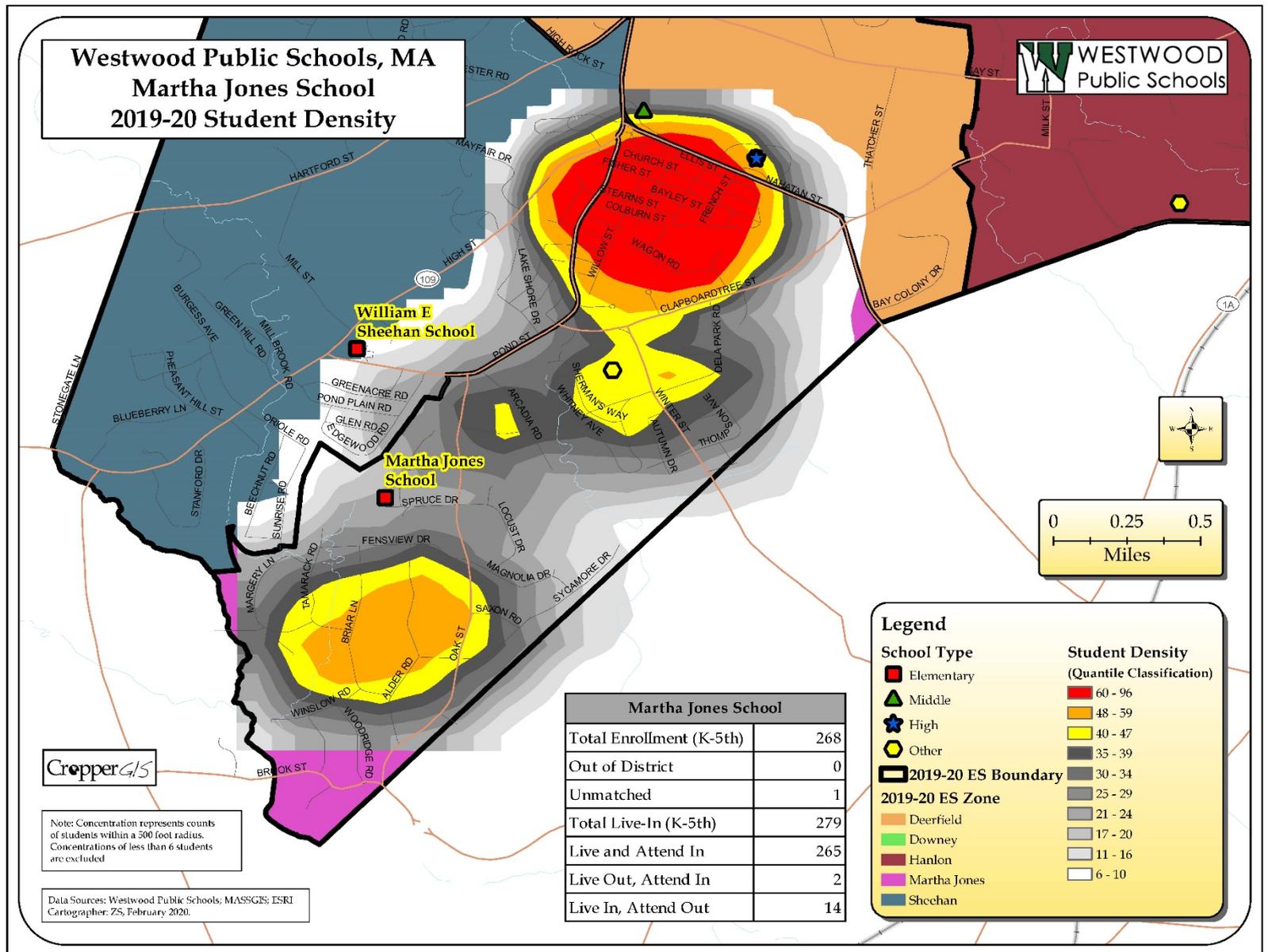
Attend

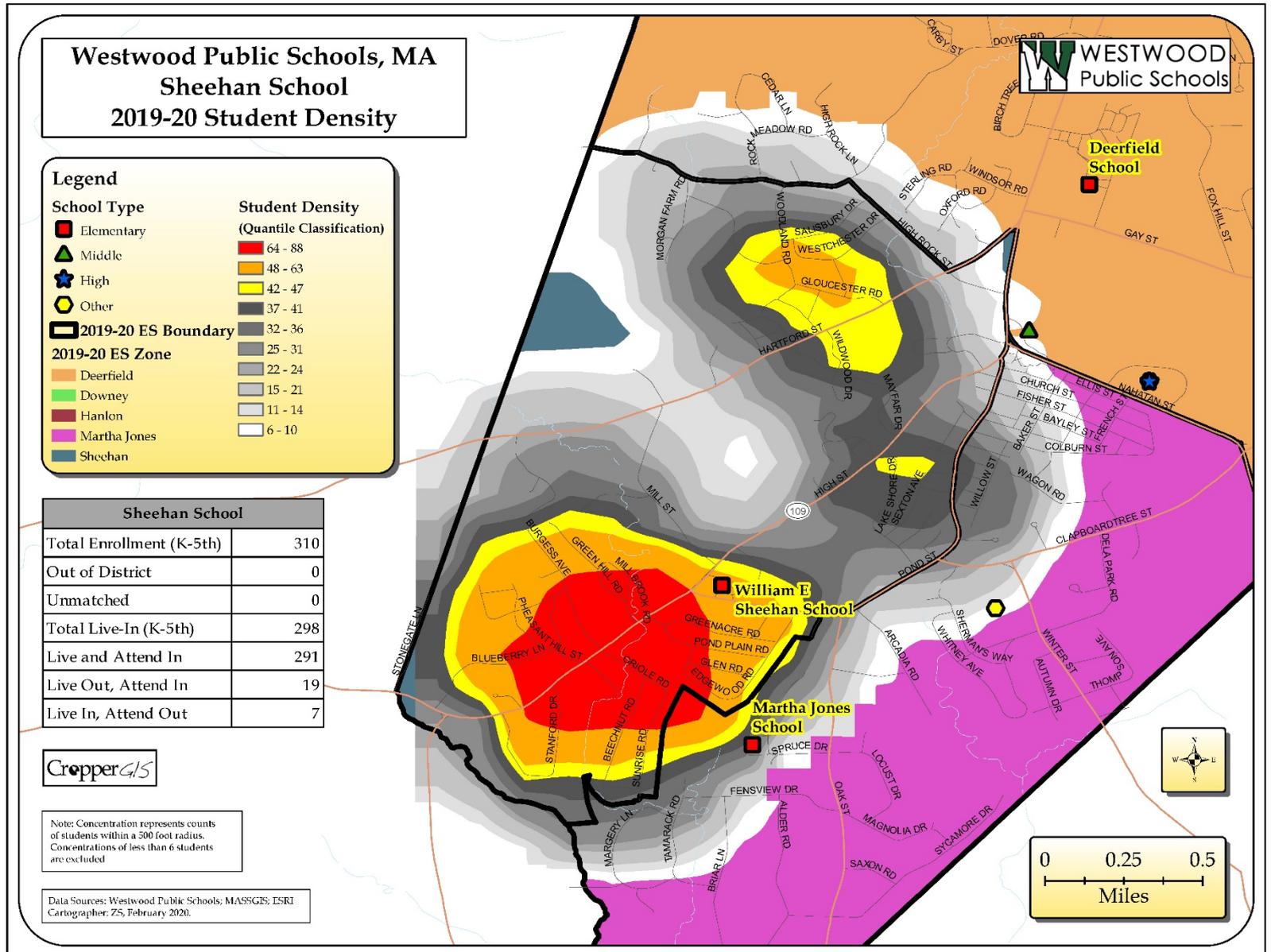
		Where 9-12 Students Live			
		WESTWOOD HIGH SCHOOL	Out of District	Unmatched	Live Out, Attend In (9-12)
		971	30	1	30
WESTWOOD HIGH SCHOOL	998	967	30	1	30
ATTEND OUT OF DISTRICT	4	4			
Live In, Attend Out (9-12)	4	4			



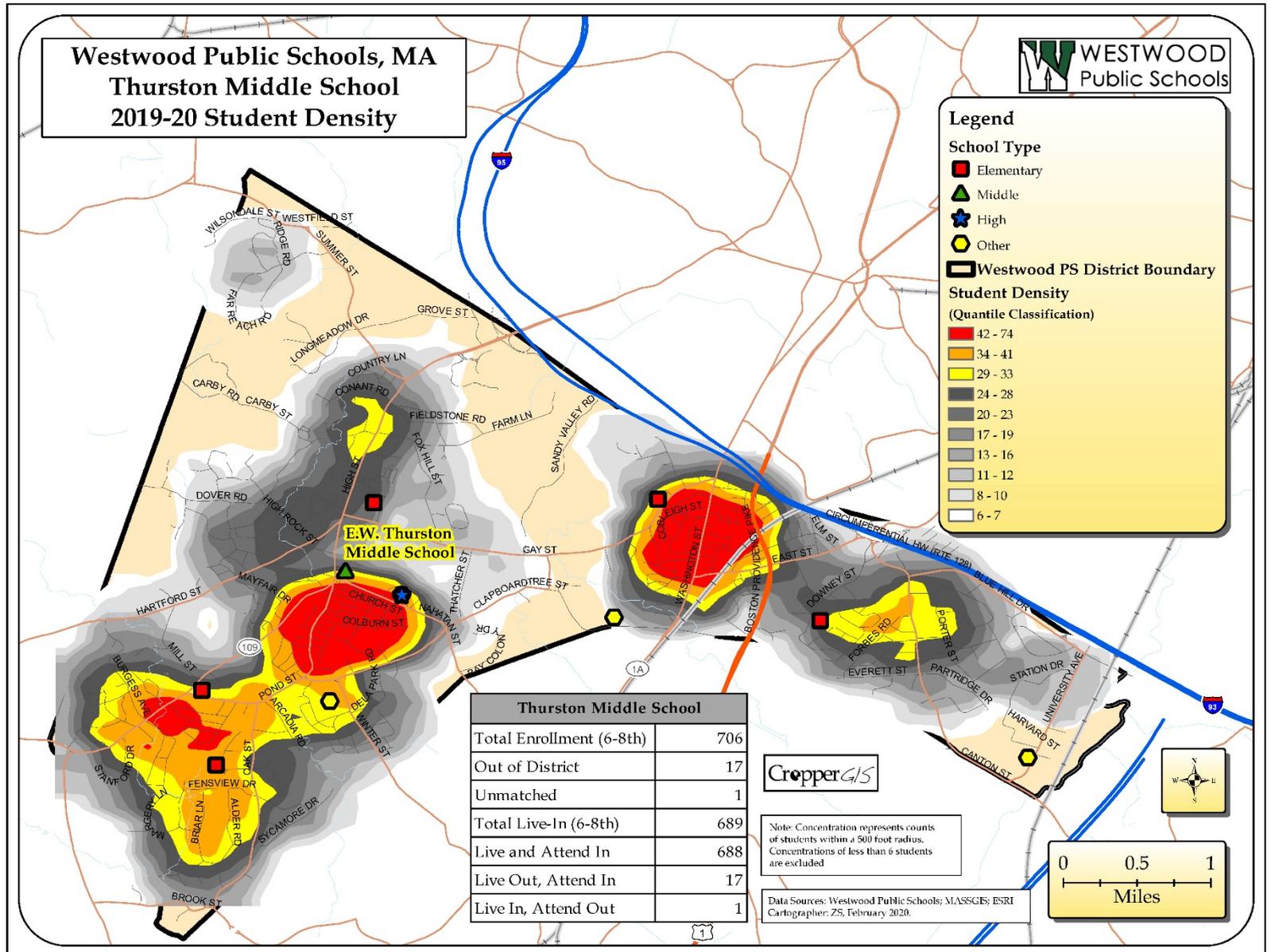


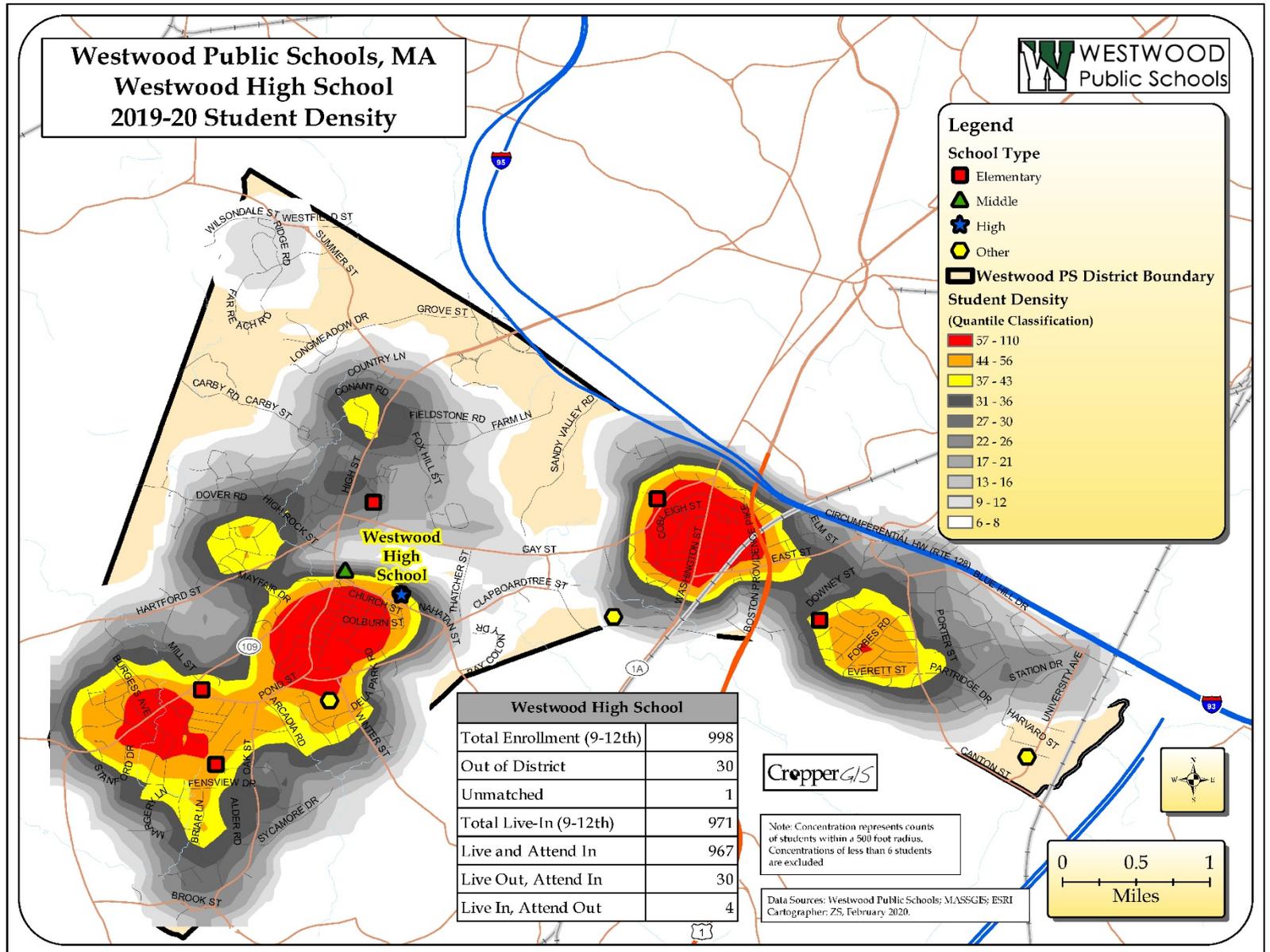






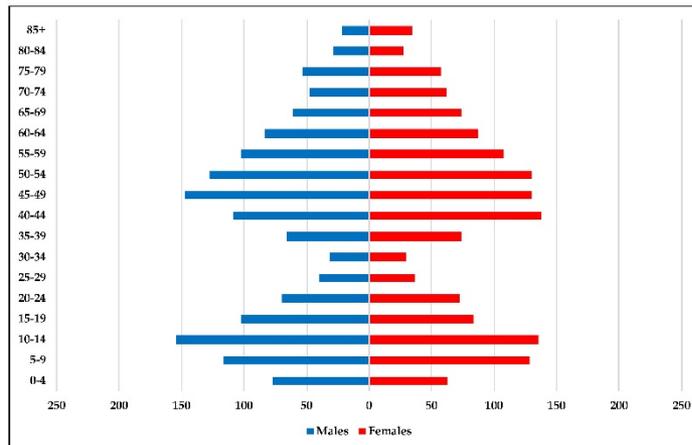
2019-20 Thurston MS Density



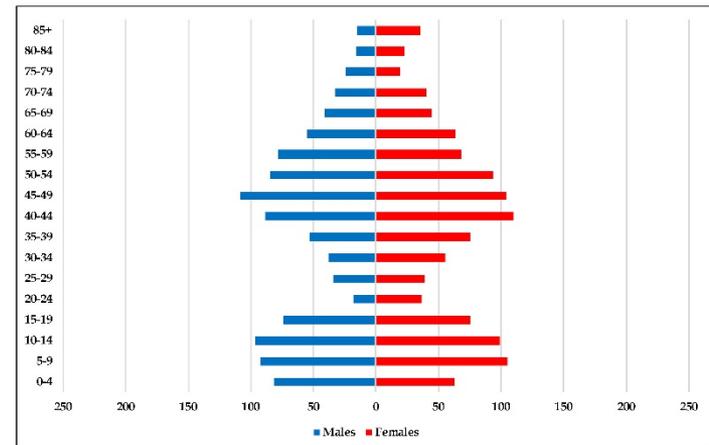


WESTWOOD PUBLIC SCHOOLS, MA
FACILITY PLANNING

Downey School - 2010 Census

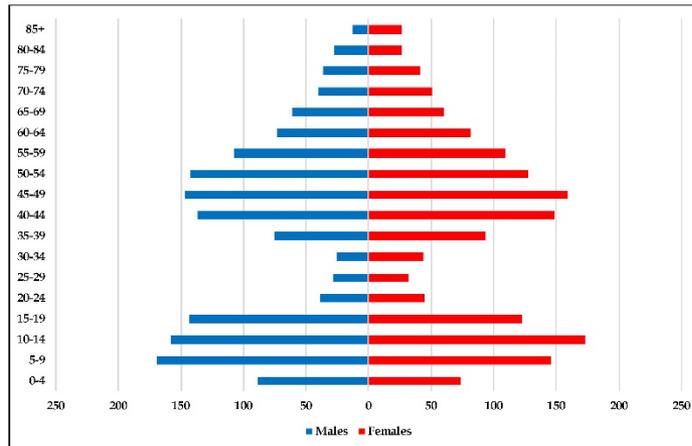


Hanlon School - 2010 Census

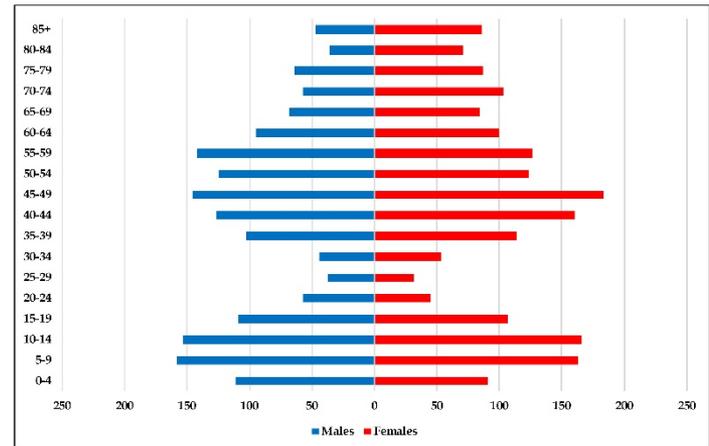


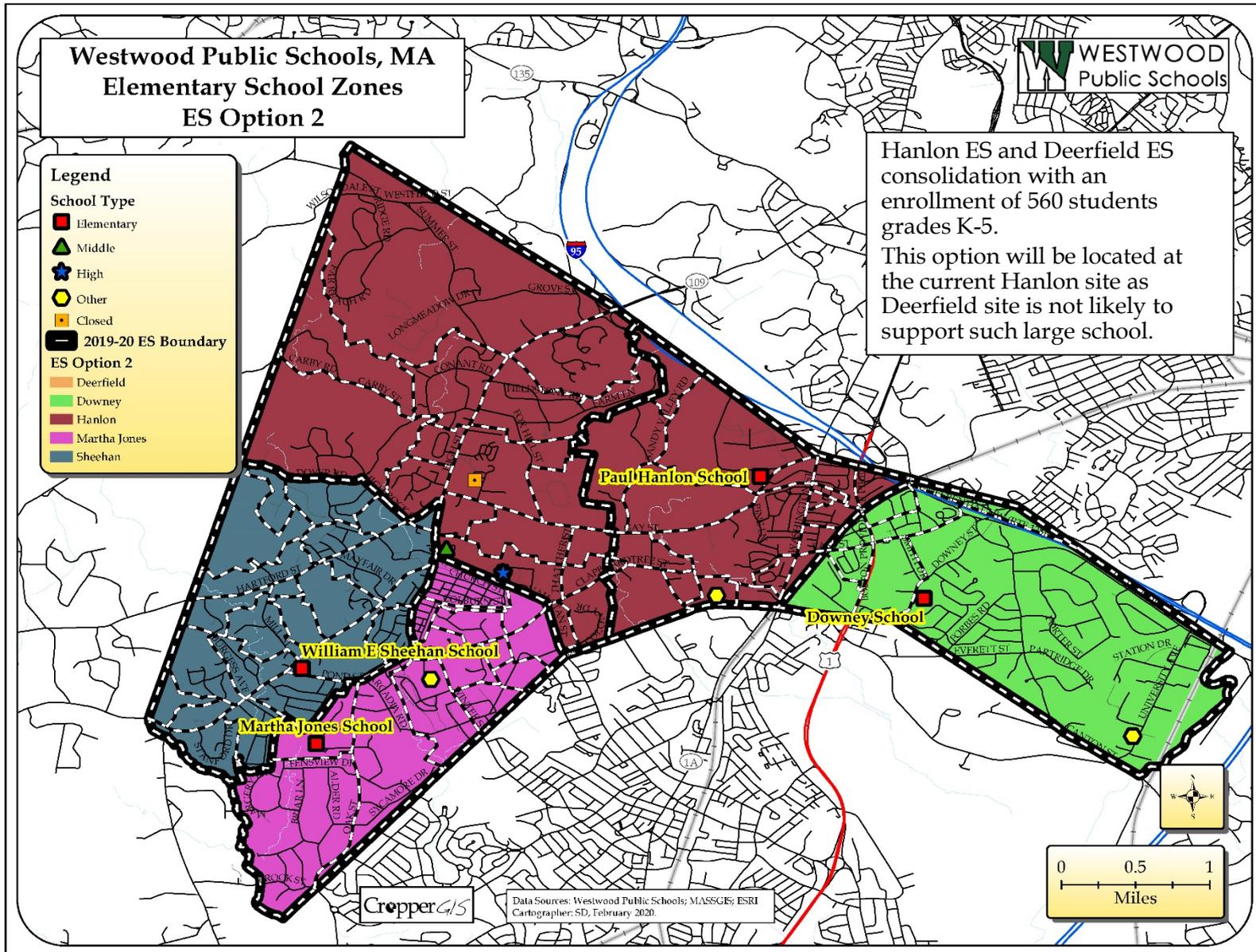
WESTWOOD PUBLIC SCHOOLS, MA
FACILITY PLANNING

Martha Jones School - 2010 Census



Sheehan School - 2010 Census



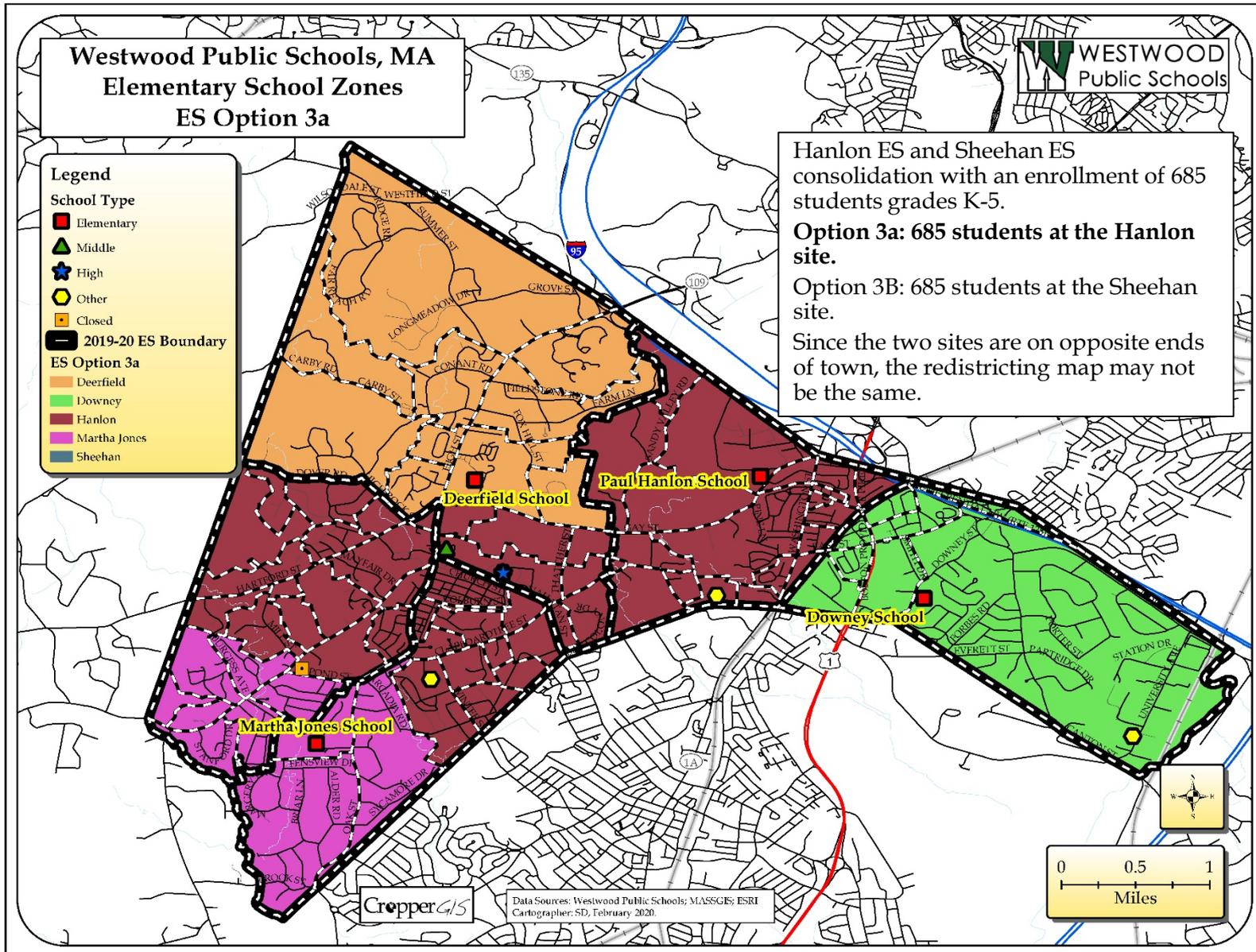


Advantages

- Better balance of building utilization among the schools.
- Impacts the least amount of K-5 students (175) out of all the options.
- Substantial capacity relief to the former Deerfield ES student population and Hanlon ES.
- New Hanlon ES schools opens up at 72% utilization giving room for future growth
- The most amount of K-5 Live and Attend In students (131) living within $\frac{1}{4}$ -mile of each school out of all the options.
 - Greatest potential for student walkers in the district if $\frac{1}{4}$ -mile school buffer is used.

Limitations

- Transportation challenge with the increased travel time for some of the students attending the new Paul Hanlon ES.
 - Furthest Live and Attend In attending student is approx. 4.1-miles away by road.
- No capacity relief provided to Downey and Sheehan ES.

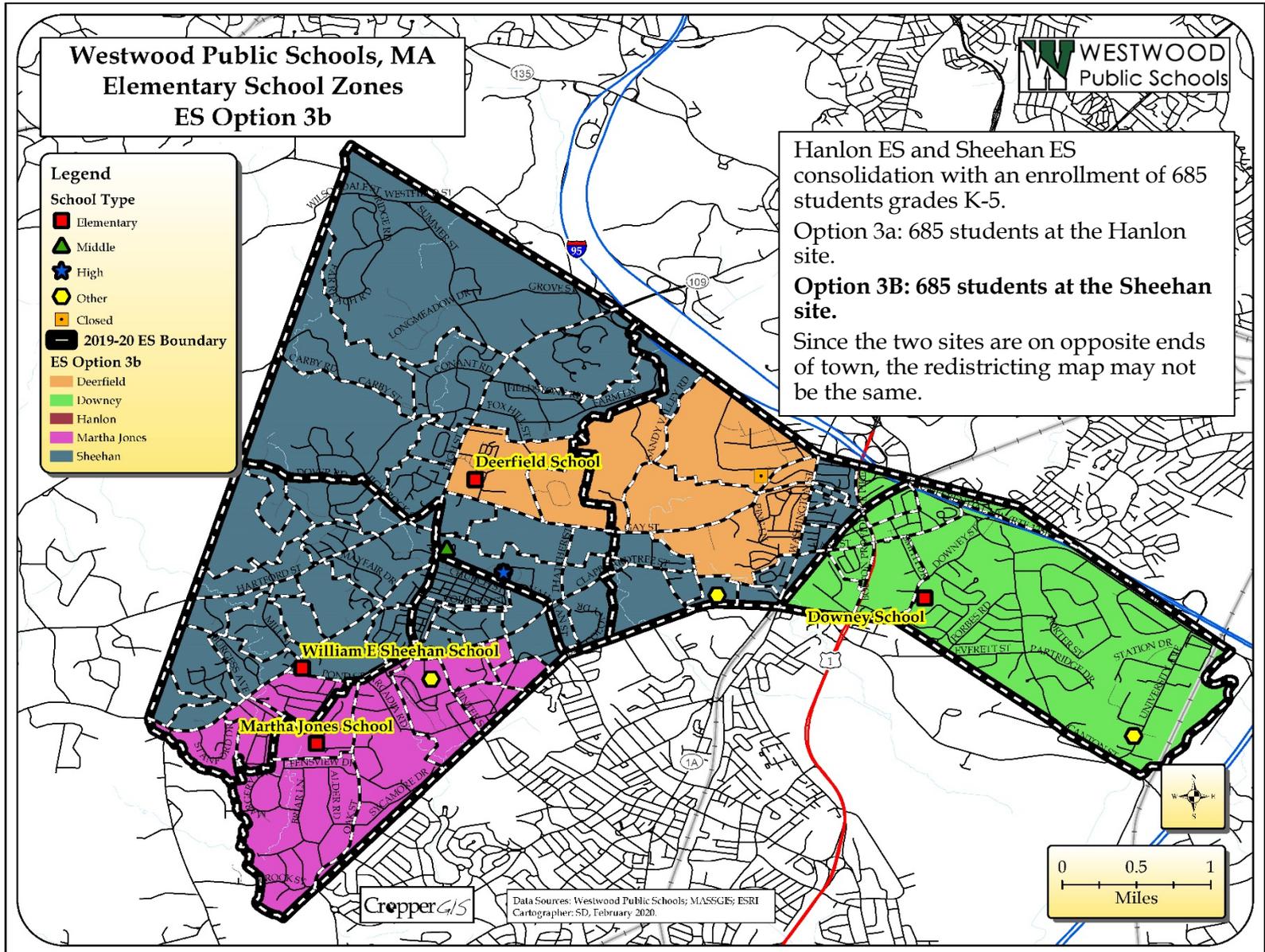


Advantages

- Better balance of building utilization among the schools.
- Substantial capacity relief to Deerfield ES and Hanlon ES.
- The new Hanlon ES school opens up at 78% utilization giving room for future growth.
- The most amount of K-5 Live and Attend In students (464) within a ½-mile buffer of each school out of all the options.
 - Greatest potential for student walkers in the district if ½-mile school buffer is used.

Limitations

- Transportation challenge with the increased travel time for some of the students attending the new Hanlon ES.
 - Furthest Live and Attend In attending student is approx. 3.4-miles away by road)
 - Students living in the west end of the district will have to pass Deerfield ES to get to Hanlon ES.
- Impacts the second most amount of K-5 students (464) out of all the options.
- No capacity relief provided to Downey ES.

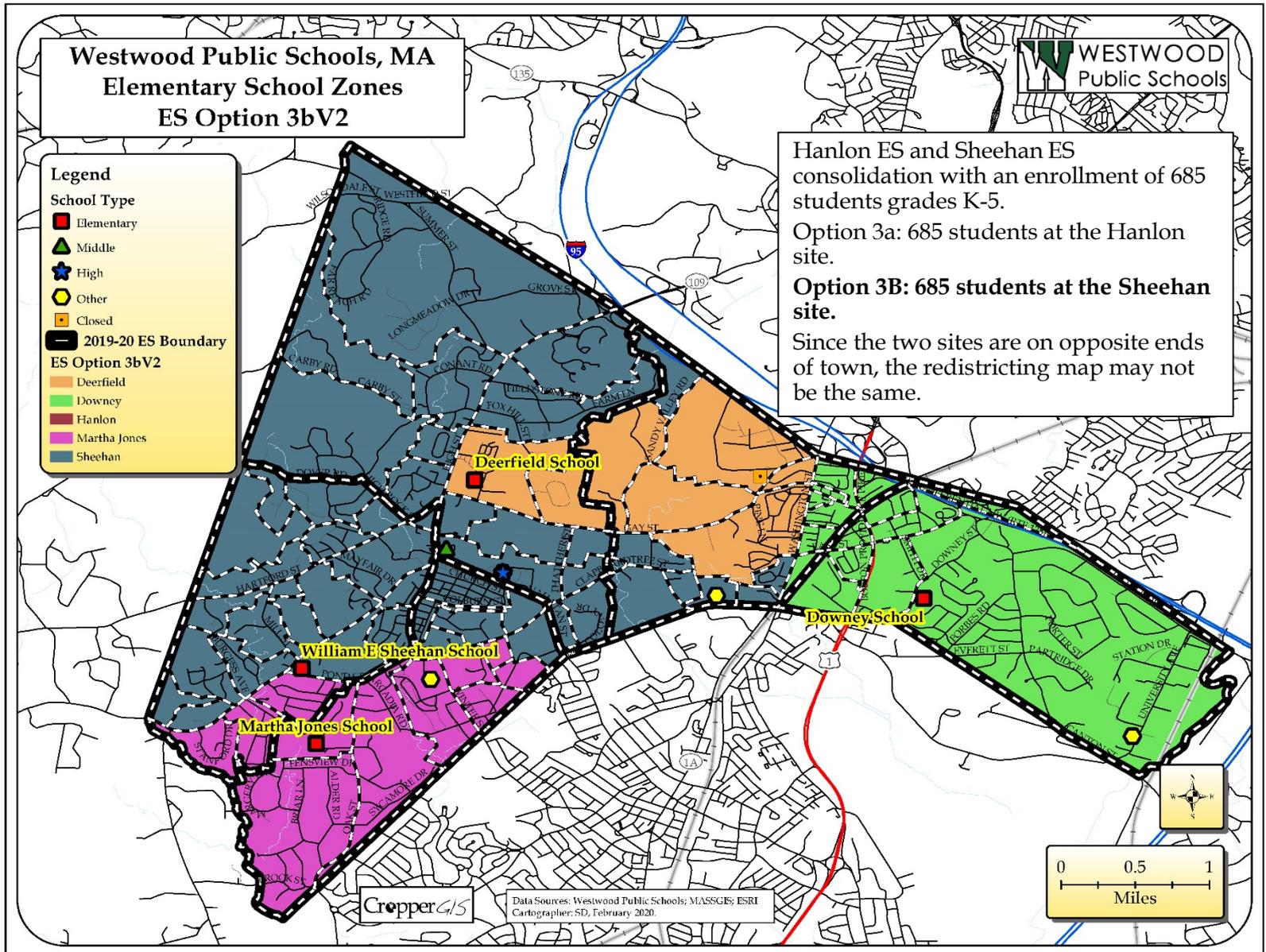


Advantages

- Better balance of building utilization among the schools.
- Substantial capacity relief to the Deerfield ES and the former Hanlon ES student population.
- The new Sheehan ES school opens up at 79% utilization giving room for future growth.

Limitations

- Impacts the most amount of K-5 students (528) out of all the options.
- Transportation challenge with the increased travel time for some of the students attending Deerfield ES and the new Sheehan ES.
 - Conservation area north of Gay street disconnects Deerfield ES from majority of the projected student population it would now serve.
 - Students living in the north end of the district will have to pass Deerfield ES to get to Sheehan ES.
- No capacity relief provided to Downey ES.



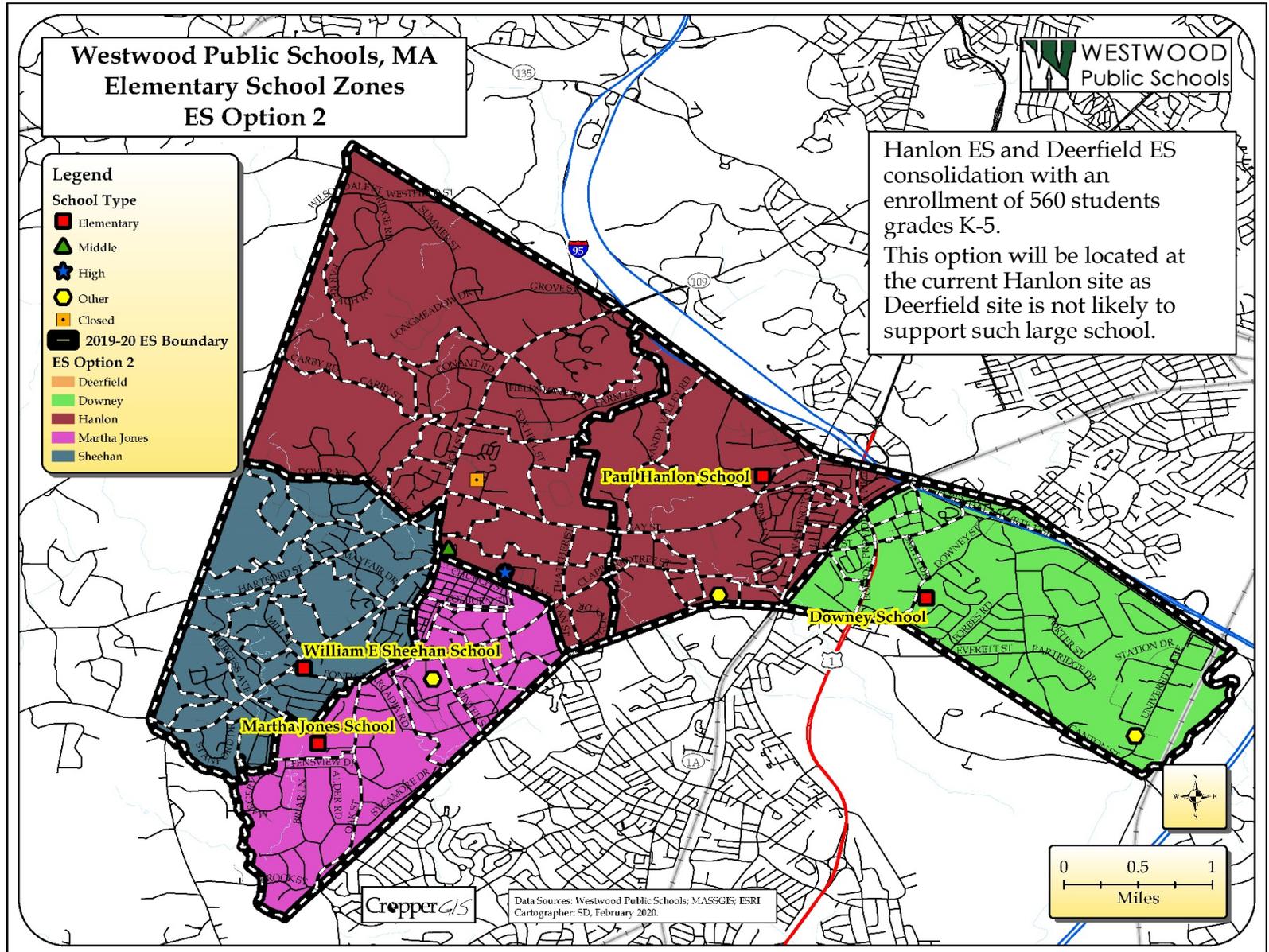
Advantages

- Substantial capacity relief to the Deerfield ES and the former Hanlon ES student population.
- The new Sheehan ES school opens up at 72% utilization giving room for future growth.

Limitations

- Impacts the most amount of K-5 students (528) out of all the options.
- Transportation challenge with the increased travel time for some of the students attending Deerfield ES and the new Sheehan ES.
 - Conservation area north of Gay street disconnects Deerfield ES from majority of the projected student population it would now serve.
 - Students living in the north end of the district will have to pass Deerfield ES to get to Sheehan ES.
- Downey ES is over capacity at 101% utilization.

Recommendation: ES Option 2



ES Name	Grade Config	2020 MSBA Capacity	Option 2 Capacity	Option 3a Capacity	Option 3b Capacity	Option 3b_V2 Capacity
DEERFIELD SCHOOL	K-5	218	0	218	218	218
DOWNEY SCHOOL	PK-5	333	333	333	333	333
MARTHA JONES SCHOOL	K-5	333	333	333	333	333
PAUL HANLON SCHOOL	K-5	218	560	685	0	0
WILLIAM E. SHEEHAN SCHOOL	K-5	356	356	0	685	685
Total		1,458	1,582	1,569	1,569	1,569

Counts based on January 2020 Student Enrollment Database

² The estimated enrollment is calculated by adding the 2019-20 PK students to their 2019-20 school, plus the K-5th students that “Live Out and Attend In” a 2019-20 school, plus the Unmatched, plus the total number of live in K-5th grade students within each new DRAFT option zone that “Live and Attend In” during the 2019-20 school year.

[†] It is assumed that in Option 3a, the estimated enrollment for Hanlon ES includes the 19 K-5th Live Out Attend In students from Sheehan ES during the 2019-20 school year. It is assumed that in Option 3b and 3b_V2, the estimated enrollment for Deerfield ES includes the 9 K-5th Live Out Attend In students from Hanlon ES during the 2019-20 school year.

ES Name	Grade Config	Option 2 Estimated Enrollment ² (Total Headcount)	Option 3a Estimated Enrollment ² (Total Headcount)	Option 3b Estimated Enrollment ² (Total Headcount)	Option 3b_V2 Estimated Enrollment ² (Total Headcount)
DEERFIELD SCHOOL	K-5	Consolidated	173	178	178
DOWNEY SCHOOL	PK-5	288	288	288	335
MARTHA JONES SCHOOL	K-5	268	272	259	259
PAUL HANLON SCHOOL	K-5	402	535	Consolidated	0
WILLIAM E. SHEEHAN SCHOOL	K-5	310	Consolidated	543	496
Total		1268	1268	1268	1,268

Counts based on January 2020 Student Enrollment Database

² The estimated enrollment is calculated by adding the 2019-20 PK students to their 2019-20 school, plus the K-5th students that “Live Out and Attend In” a 2019-20 school, plus the Unmatched, plus the total number of live in K-5th grade students within each new DRAFT option zone that “Live and Attend In” during the 2019-20 school year.

[†]It is assumed that in Option 3a, the estimated enrollment for Hanlon ES includes the 19 K-5th Live Out Attend In students from Sheehan ES during the 2019-20 school year. It is assumed that in Option 3b and 3b_V2, the estimated enrollment for Deerfield ES includes the 9 K-5th Live Out Attend In students from Hanlon ES during the 2019-20 school year.

ES Name	Grade Config	2019-20 PK-5 Enrollment Utilization		Option 2 Estimated Utilization ²		Option 3a Estimated Utilization ²		Option 3b Estimated Utilization ²		Option 3b_V2 Estimated Utilization ²	
		+ / -	%	+ / -	%	+ / -	%	+ / -	%	+ / -	%
DEERFIELD SCHOOL	K-5	-21	90%	0	0%	-45	79%	-40	82%	-40	82%
DOWNEY SCHOOL	PK-5	-45	86%	-45	86%	-45	86%	-45	86%	2	101%
MARTHA JONES SCHOOL	K-5	-65	80%	-65	80%	-61	82%	-74	78%	-74	78%
PAUL HANLON SCHOOL	K-5	-13	94%	-158	72%	-150	78%	0	0%	0	0%
WILLIAME. SHEEHAN SCHOOL	K-5	-46	87%	-46	87%	0	0%	-142	79%	-189	72%
Total		-190	87%	-314	80%	-301	81%	-301	81%	-301	81%

Counts based on January 2020 Student Enrollment Database

² The estimated enrollment is calculated by adding the 2019-20 PK students to their 2019-20 school, plus the K-5th students that “Live Out and Attend In” a 2019-20 school, plus the Unmatched, plus the total number of live in K-5th grade students within each new DRAFT option zone that “Live and Attend In” during the 2019-20 school year.

[†]It is assumed that in Option 3a, the estimated enrollment for Hanlon ES includes the 19 K-5th Live Out Attend In students from Sheehan ES during the 2019-20 school year. It is assumed that in Option 3b and 3b_V2, the estimated enrollment for Deerfield ES includes the 9 K-5th Live Out Attend In students from Hanlon ES during the 2019-20 school year.

Student Impact Estimates	
Option	Total K-5 Live and Attend In Students Impacted
Option 2	175
Option 3a	464
Option 3b	528
Option 3b_V2	528

2019-20 ES Boundary	ES Option 2 Boundary	Total K-5 Live and Attend In Students
Deerfield	Hanlon	175
Downey	Downey	265
Hanlon	Hanlon	196
Martha Jones	Martha Jones	265
Sheehan	Sheehan	291

2019-20 ES Boundary	ES Option 3a Boundary	Total K-5 Live and Attend In Students
Deerfield	Deerfield	151
Deerfield	Hanlon	24
Downey	Downey	265
Hanlon	Hanlon	196
Martha Jones	Hanlon	149
Martha Jones	Martha Jones	116
Sheehan	Hanlon	138
Sheehan	Martha Jones	153

2019-20 ES Boundary	ES Option 3b Boundary	Total K-5 Live and Attend In Students
Deerfield	Deerfield	32
Deerfield	Sheehan	143
Downey	Downey	265
Hanlon	Deerfield	115
Hanlon	Sheehan	81
Martha Jones	Martha Jones	166
Martha Jones	Sheehan	99
Sheehan	Martha Jones	90
Sheehan	Sheehan	201

2019-20 ES Boundary	ES Option 3b_V2 Boundary	Total K-5 Live and Attend In Students
Deerfield	Deerfield	32
Deerfield	Sheehan	143
Downey	Downey	265
Hanlon	Deerfield	115
Hanlon	Downey	47
Hanlon	Sheehan	34
Martha Jones	Martha Jones	166
Martha Jones	Sheehan	99
Sheehan	Martha Jones	90
Sheehan	Sheehan	201

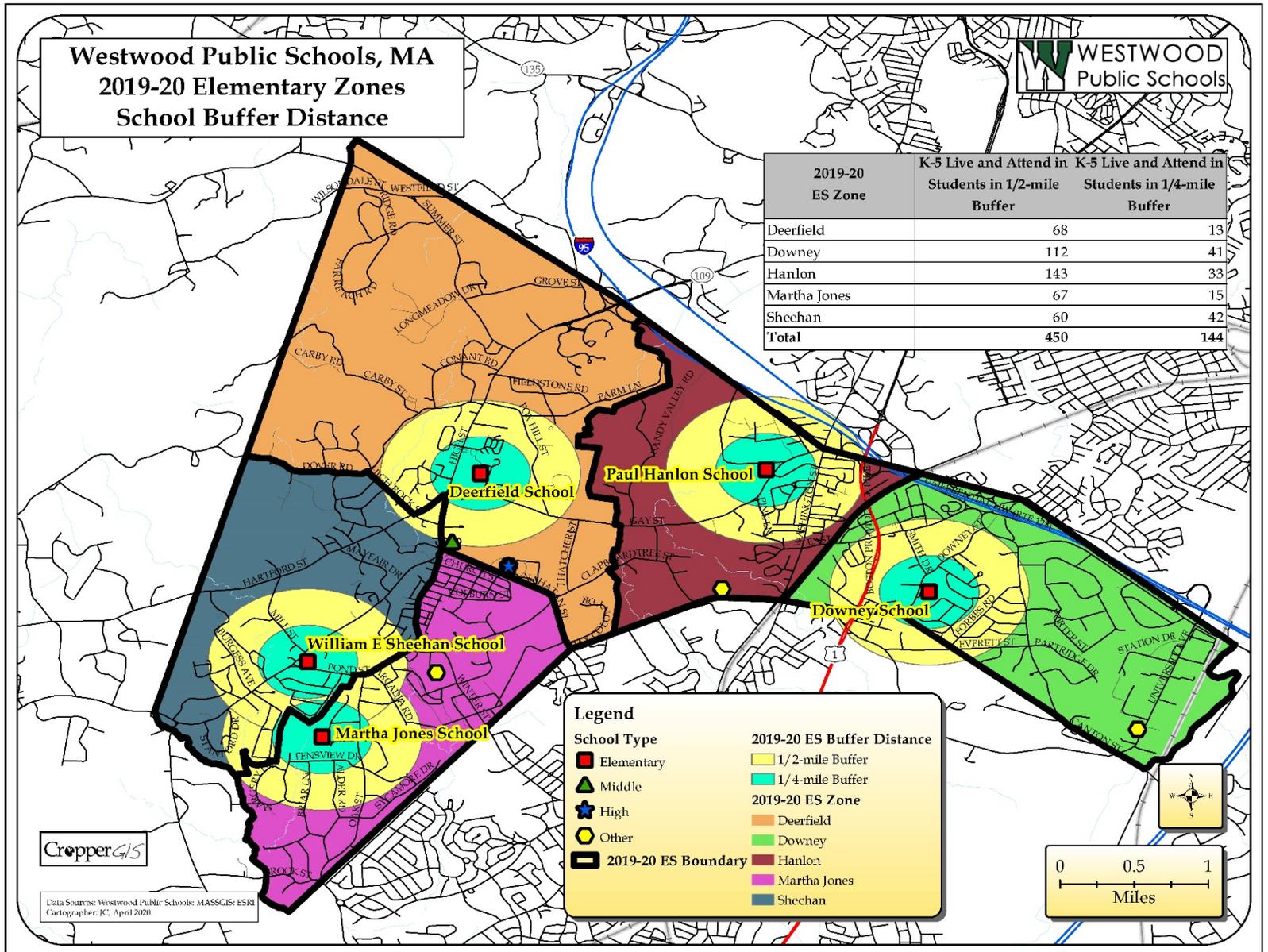
2019-20 ES Boundary	2019-20 MS Boundary	Total K-5 Live and Attend In	ES Attendance
Deerfield	EW THURSTON MIDDLE SCHOOL	175	100%
Downey	EW THURSTON MIDDLE SCHOOL	265	100%
Hanlon	EW THURSTON MIDDLE SCHOOL	196	100%
Martha Jones	EW THURSTON MIDDLE SCHOOL	265	100%
Sheehan	EW THURSTON MIDDLE SCHOOL	291	100%

ES Option 2 Boundary	2019-20 MS Boundary	Total K-5 Live and Attend In	ES Attendance
Downey	EW THURSTON MIDDLE SCHOOL	265	100%
Hanlon	EW THURSTON MIDDLE SCHOOL	371	100%
Martha Jones	EW THURSTON MIDDLE SCHOOL	265	100%
Sheehan	EW THURSTON MIDDLE SCHOOL	291	100%

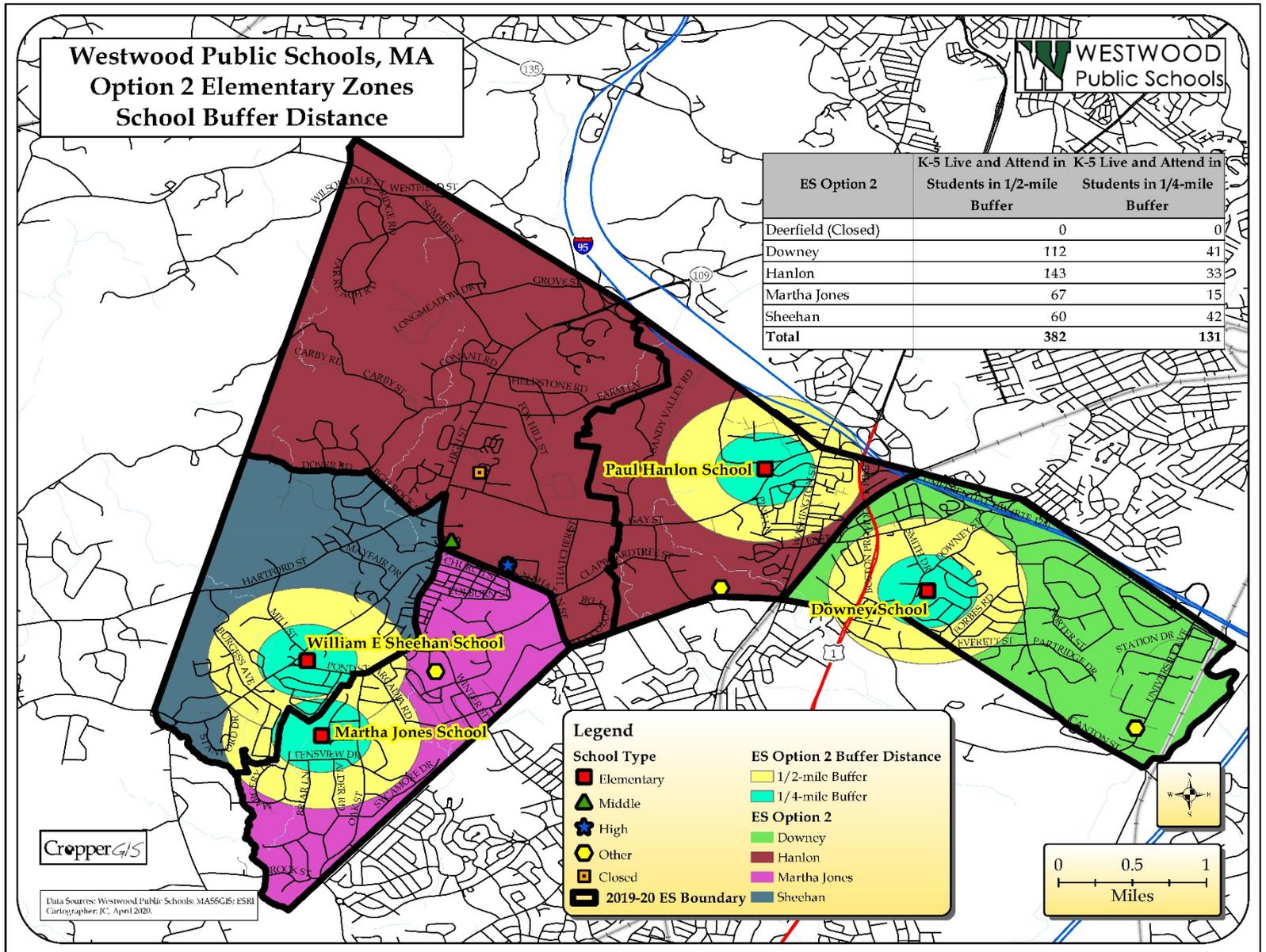
ES Option 3a Boundary	2019-20 MS Boundary	Total K-5 Live and Attend In	ES Attendance
Deerfield	EW THURSTON MIDDLE SCHOOL	151	100%
Downey	EW THURSTON MIDDLE SCHOOL	265	100%
Hanlon	EW THURSTON MIDDLE SCHOOL	507	100%
Martha Jones	EW THURSTON MIDDLE SCHOOL	269	100%

ES Option 3b Boundary	2019-20 MS Boundary	Total K-5 Live and Attend In	ES Attendance
Deerfield	EW THURSTON MIDDLE SCHOOL	168	100%
Downey	EW THURSTON MIDDLE SCHOOL	265	100%
Martha Jones	EW THURSTON MIDDLE SCHOOL	265	100%
Sheehan	EW THURSTON MIDDLE SCHOOL	494	100%

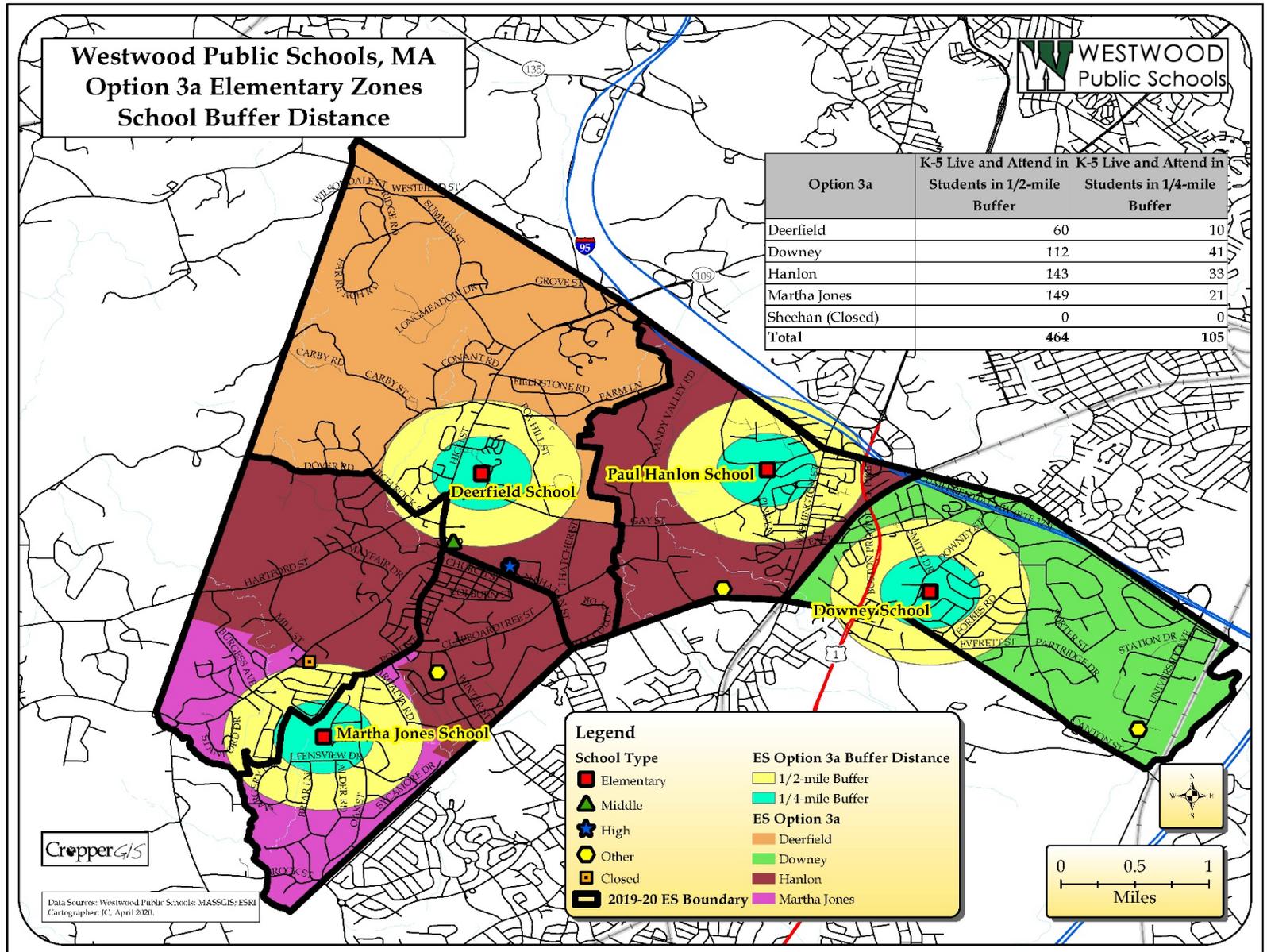
2019-20 ES Distance Buffer Map



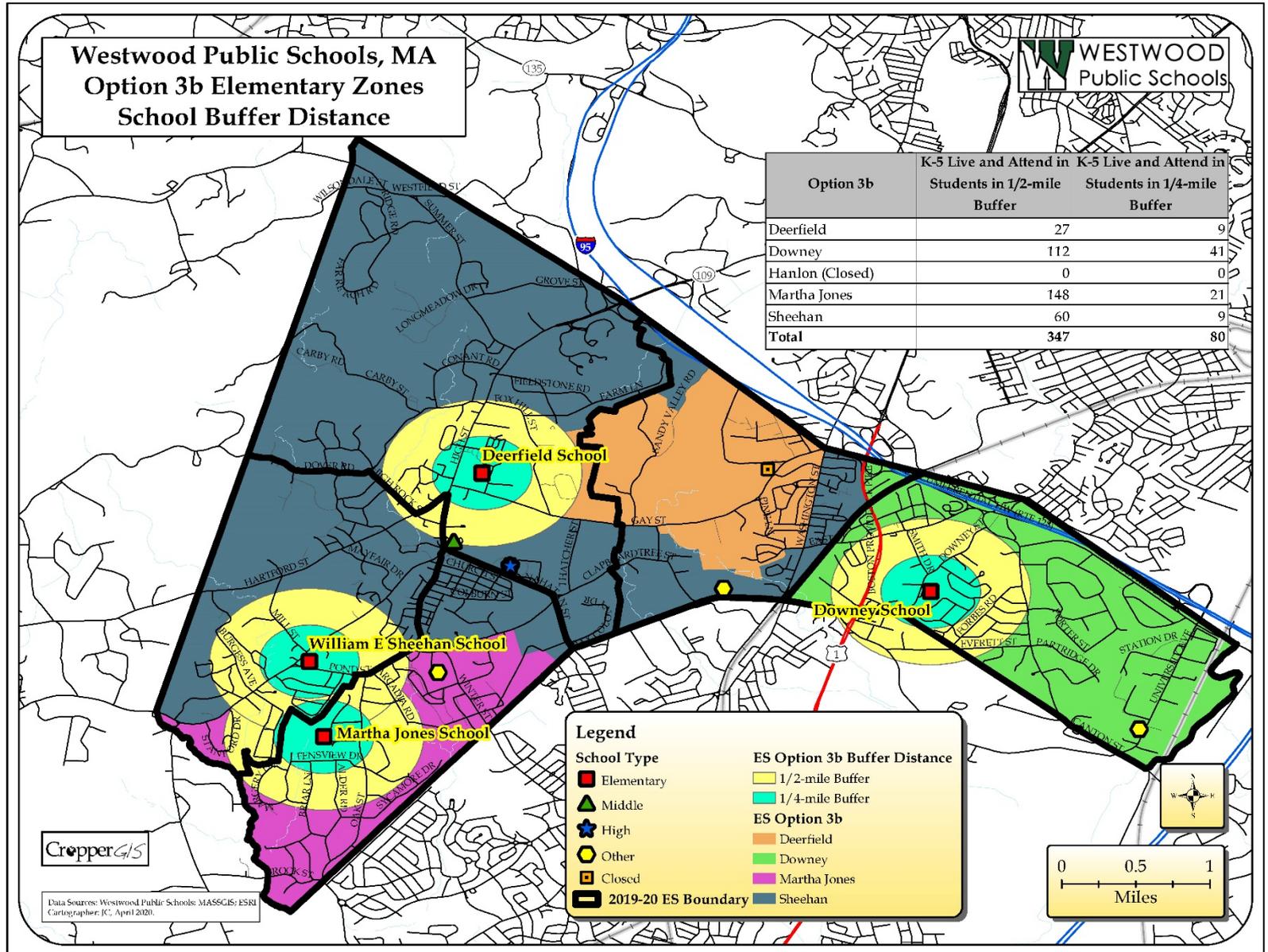
ES Option 2 Distance Buffer Map

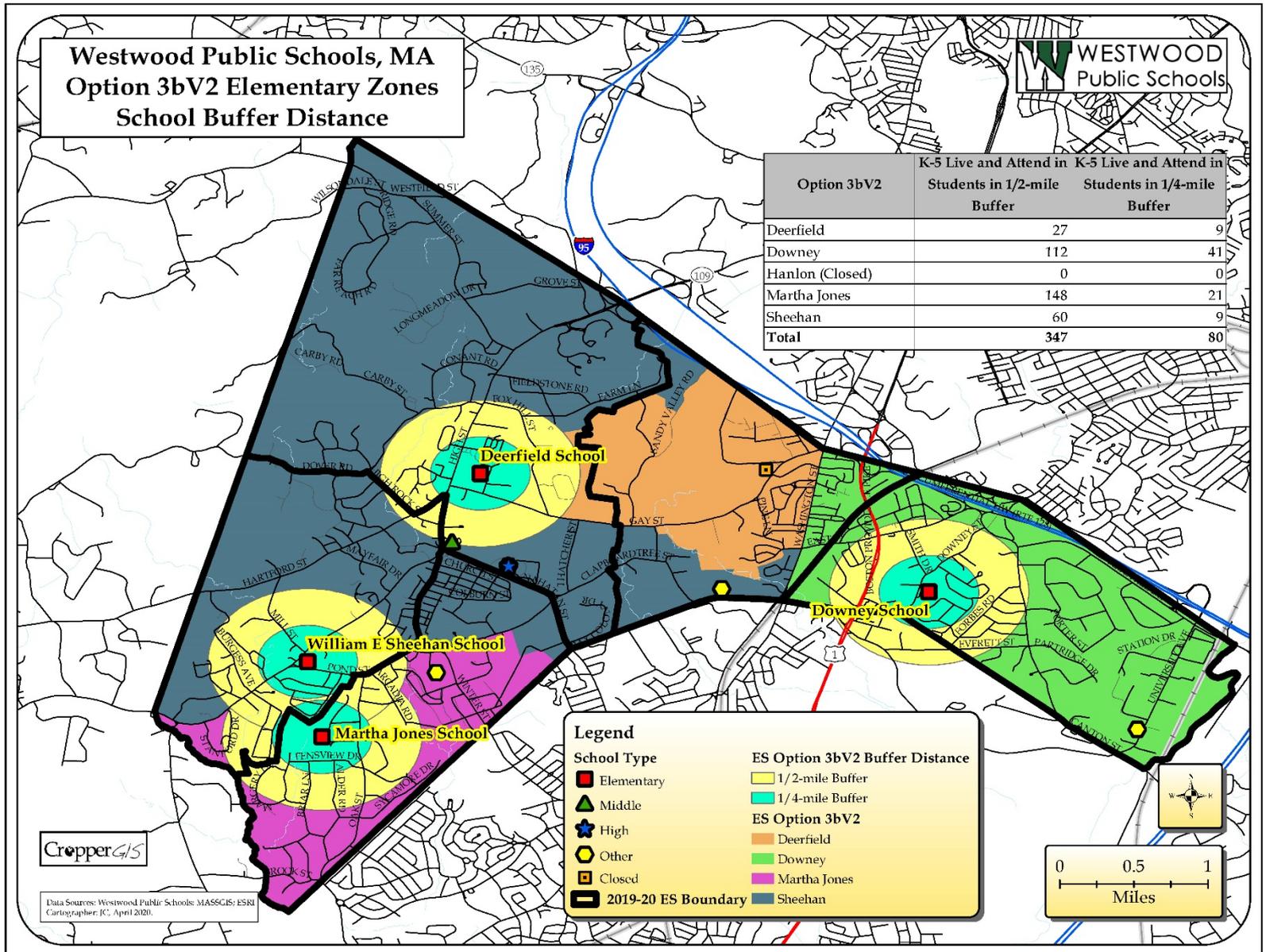


ES Option 3a Distance Buffer Map



ES Option 3b Distance Buffer Map

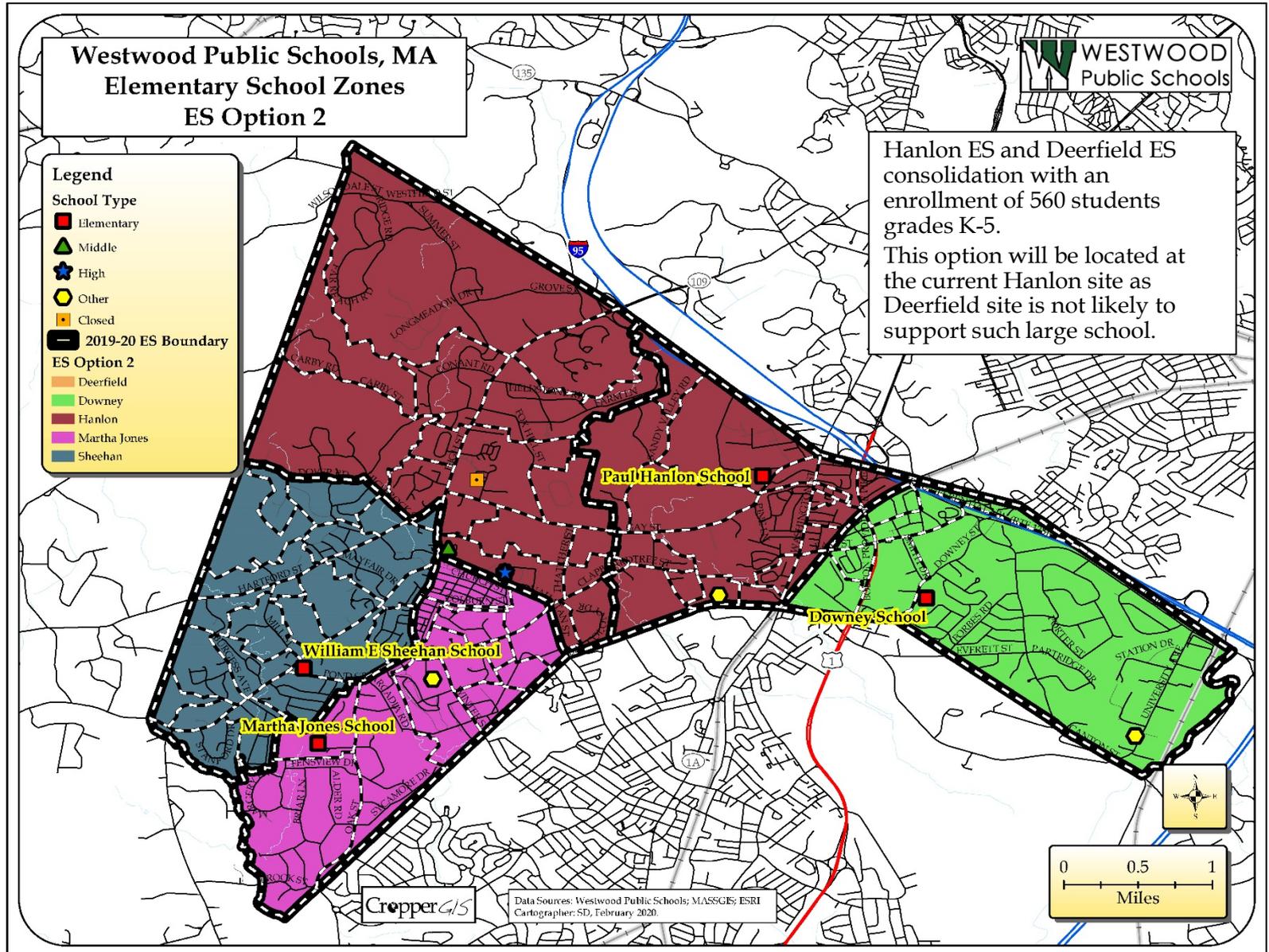




Recommendation: ES Option 2

- Feel that the recommended option is the most feasible of all the options presented in the Master Plan Capital Needs Study (June 2015 by SMMA).
 - Determining Factors:
 - Impacts the least amount of students/families
 - Greatest potential for student walkers in the district if 1/4-mile school buffer is used.
 - Resulting Elementary School Boundaries are reasonable in terms of student population density (where students are concentrated throughout the district) and the geographic layout of the land (using major roads/physical landmarks to set boundaries).

Recommendation: ES Option 2



Recommended ES Option 2- Enrollment Utilization

ES Name	Grade Config	2020 MSBA Capacity	Option 2 Capacity	2019-20 PK-5 Enrollment Utilization		Option 2 Estimated Utilization ²	
				+ / -	%	+ / -	%
DEERFIELD SCHOOL	K-5	218	0	-21	90%	0	0%
DOWNEY SCHOOL	PK-5	333	333	-45	86%	-45	86%
MARTHA JONES SCHOOL	K-5	333	333	-65	80%	-65	80%
PAUL HANLON SCHOOL	K-5	218	560	-13	94%	-158	72%
WILLIAM E. SHEEHAN SCHOOL	K-5	356	356	-46	87%	-46	87%
Total		1,458	1,582	-190	87%	-314	80%

Counts based on January 2020 Student Enrollment Database

² The estimated enrollment is calculated by adding the 2019-20 PK students to their 2019-20 school, plus the K-5th students that "Live Out and Attend In" a 2019-20 school, plus the Unmatched, plus the total number of live in K-5th grade students within each new DRAFT option zone that "Live and Attend In" during the 2019-20 school year.

Recommended ES Option 2- Impacts

Student Impact Estimates	
Option	Total K-5 Live and Attend In Students Impacted
Option 2	175

2019-20 ES Boundary	ES Option 2 Boundary	Total K-5 Live and Attend In Students
Deerfield	Hanlon	175
Downey	Downey	265
Hanlon	Hanlon	196
Martha Jones	Martha Jones	265
Sheehan	Sheehan	291

Recommended ES Option 2- Buffer Statistics

ES Option 2	K-5 Live and Attend in Students in 1/2-mile Buffer	K-5 Live and Attend in Students in 1/4-mile Buffer
Deerfield (Closed)	0	0
Downey	112	41
Hanlon	143	33
Martha Jones	67	15
Sheehan	60	42
Total	382	131

Recommended ES Option 2- Feeder Patterns

ES Option 2 Boundary	2019-20 MS Boundary	Total K-5 Live and Attend In	ES Attendance
Downey	EW THURSTON MIDDLE SCHOOL	265	100%
Hanlon	EW THURSTON MIDDLE SCHOOL	371	100%
Martha Jones	EW THURSTON MIDDLE SCHOOL	265	100%
Sheehan	EW THURSTON MIDDLE SCHOOL	291	100%

Questions?