#### A Simple Financial Model for K-5 Buildings\*

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\* Please note, I try hard to provide the source of my numbers and the calculations that I am performing. These numbers were pulled together on the side and fairly quickly. My hope is that, by being transparent about these numbers, any errors that exist can be corrected.

#### Goal

- Provide a simple and transparent way to think about structuring K-5 buildings that is financially sound
- Three ingredients or assumptions
  - Segment schools into three pieces
  - Size of the K-5 population
  - The average "classroom" or "teaching unit" size
- While these three ingredients are simple and transparent, they are chosen so that
  - (a) Our elementary schools fit our middle and high schools
  - (b) That the operating costs can be appropriately met



\* Given that SOC children can choose to stay in the district, adding SOC at the K-5 level will lead to more SOC at the middle and high school levels. Increasing the size of pre-K need not increase the K-5.



\* To be clear, this planning document is taking 1,632 as an input parameter. If the "right number" were different, it would just change the math that follows. My main purpose here is to lay out that assumptions can help us with our planning and show how they can be used to guide our analysis. Ideally, there would be a district-wide, long-range strategic plan that would sketch where the district is headed, so that we can build schools that fit the strategic plan. It doesn't appear that such a strategic plan exists. In absence of that, this specific assumption seemed reasonable given that we have invested heavily in our current middle school and high school facilities, so this assumption is taking those schools as our starting point.

\*\*Our lowest resident enrollment for K-12 was 2,640 in 2011. The 2015 resident enrollment was 2,709. On average, we added 17.25 (=(2,709-2,640)/4) residents between these years. In 2015, the SOC enrollment was 829. At a growth rate of 17.25 residents per year, it would take 24 years (=(829/2)/17.25) for the SOC to fall by half. Put another way, it is commonly argued that SOC has kept our district strong because it filled in for declining residents—this calculation simply uses that argument in reverse.



From a budgetary perspective, working with averages is a good way to proceed. Why? If average costs are equal to average revenue, then total costs are equal to total revenues.

From an operational perspective, it is exactly the variation around averages that is so difficult. The district must handle the cohort-to-cohort and year-to-year variation that will always exist. This is a statement not about averages, but about the variability around the average. Some of this variability can be smoothed with the SOC population. Other variability should be included in the planning process, but that planning needs to be about ensuring there is adequate and flexible space in the schools to handle the variability. In other words, variability will exist regardless of the overall population we build for.

\* This number is an average over all six elementary grades (K-5). We may not necessarily want to distribute these classes equally across all grades. For example, we currently have more classes for the K-2 grades (12 across all schools) than we have the 5<sup>th</sup> grade (10 across all schools), which delivers smaller classes sizes for K-2 than for the 5<sup>th</sup> grade. Such considerations can and should be taken into account when we distribute these classes across buildings, but that doesn't affect the basic math: On average, we need 24 students per class in the K-5, which will deliver us 68 classrooms.



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\* These numbers come from the September 9<sup>th</sup>, 2016 enrollment numbers. See appendix. Note that the Dev-K are not included here because they do not necessarily increase middle and school class sizes.

It should be noted that, although 24 matches the district average, it doesn't match a school average or a class average. There will always be year-to-year, cohort-to-cohort, and catchment-to-catchment variation that poses a difficult operational challenge to a district. We need to build schools that can handle this variation—but such variation will exist whether we shrink or grow our district.

#### The real question...

How are these 68 classrooms distributed across <u>elementary</u> buildings A through F?

The model allows us to consider potential options

Remember, we are only talking about K-5 grades here—we will come to pre-K shortly

Options	А	В	С	D	E	F
1	12	12	12	12	12	8
2	16	16	12	12	12	0
3	14	14	14	14	12	0
4	18	18	18	14	0	0

The actual choice is a programming issue, of course— I'll come back to this

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These are just options, all of which assume we want to retain K-5 configurations. If we were to move away from all schools being K-5, it would open up many more potential configuration options. Here is the rationale behind these potential options.

Option 1: Uses six schools, keeping 2 classes per grade in as many schools as possible. Implication, school F cannot 2 of each grade K-5.

Option 2: Uses five schools, building two sizes of schools. A and B are similar to Pinecrest, and D-F are similar to Donley or Glencairn.

Option 3: Uses five schools, keeping more buildings of similar size.

Option 4: Uses four schools if one wants to have 3 classes per grade, delivering schools of 432.



\* There is more variability in smaller schools because there are fewer options to smooth enrollment spikes.

\*\* Smaller equally sized schools limit the ability to vary class size by grade. For example, if we build 5 schools with 12 classes each, it is not possible in these schools to have more classes for K. Right now, we have more classes for K because we have schools that have more than 12 classes (Marble, Pinecrest, Whitehills),



\* NOTE: FTE is important because ECSE is half-day, meaning a 16 FTE classroom serves 32 ECSE children

\*\* If we used series bonds, we could plan for multiple pods at various schools, but then build them as they make sense. For example, the district could build 1 pod, assess how it works, and then build another at another site as it makes sense. This would seem to be straight forward if the initial blueprints allowed space for a pre-K pod.

## **Our current configuration**

Below is the best information I could cobble together

Pre-K kept separate, assuming that they go into pod configuration

	Donley	Glenc.	Marble	Pine.	W Hills	Total
2016 K-5 rooms	12	12	14	16	14	68
2016 pre-K rooms	1			2		
2016 dev-K* rooms	1				1	2
2016 special ed		1	2	1		4
Totals	14	13	16	17	15	74

If we strategically place these additional classrooms across the buildings, we can provide the district additional flexibility for programming. See below.

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\* I put the Developmental Kindergarten in with Special Ed because there wasn't talk of incorporating these into the pods. With that said, they are similar to the pre-K enrollment because they do not necessarily increase the size of the district. However, they are different from the special ed classrooms because they are listed separately in the enrollment numbers.



\* Speaking as an economist, please do not mistake the survey data for the demand for feebased pre-K. Why? Putting aside the important survey-related questions that were raised, key product characteristics couldn't be spelled out in the survey.

- •Price. Would individuals Radmoor tuition for ELPS pre-K?
- •Location. Would a Marble parent bypass East Minster for Pincecrest?
- •Half-day/full-day. Would working parent households consider half-day?



\* Suppose we added on the room to accommodate those programs that we must accommodate on a regular basis. Imagine then building a "Flex Room" that would serve two purposes: (a) on those rare years where another classroom was needed, it could be used as a classroom and (b) on other years, it would be functional to handle those activities that would be nice to handle, perhaps with the inclusion of expansive closets and dividers.

\*\* GMB appears to vary the size of cafeterias by the number of students, but not the size of gyms. So, the cost of a gym is fixed per building, where the cost of a cafeteria is not.

\*\* Keep in mind that some additional costs are already built into the 24 student per teacher amount. For example, we are already providing art and music teachers in our schools, which is captured in this number. So, we do not need to add in additional operating costs for these types of rooms. If a STEAM room would need an additional, dedicated staff member, that room would come with additional operating costs.

#### The cost of add-ons

- Rule-of-thumb numbers are available to help us translate these add-ons into capital costs and operating costs
- Key questions
  - Size?
  - Additional operating costs?
  - Do we need it in every building?

	ELL room	STEAM room	Flex classroom
Square feet estimate	900	990	1200
Capital costs (\$200/sq ft)*	\$180K	\$198K	\$240K
M&O costs (\$6/ sq ft)**	\$5.4K	\$5.9K	\$7.2K
Additional operating costs?	No	??	No
Do we need in every building?	??	??	Yes
			p14

\* This number was \$250 in GMB estimates. Should this be replaced by that?

\*\* A 2008 American School & University study suggested the number was \$5. I placed it at 6 to be conservative in the sense I think it is important to protect operating costs to pay teachers (and thus I rounded up this figure).

NOTE: It is an obvious point, but keep in mind that we may incurring these costs at five schools. Thus, five flex classrooms cost \$1.2m in capital costs and \$36K a year in operating costs. In other words, M&O on the flex classrooms takes \$36K that could otherwise be spent on teachers.

#### The planning problem: Build schools that Contain 68 classrooms for the elementary students This is easily changed if the assumed parameters needs to be changed (1,632 and 24) ■ Contain (6?) classrooms for Special Ed and Dev-K ■ Contain (4?) classrooms for pre-K Contain the add-ons that are necessary for East Lansing School A Elem classrms ... Other classrms . . . School B Add-ons ... Elem classrms School C . . . Other classrms Elem classrms . . . ... Add-ons Other classrms . . . ... Add-ons . . . p15



\* If you examine the 2012 Application for Pre-Qualification, you will find that the "capacity" for grades K-2 is 20 kids and for grades 3-5 is 25 kids. We generally far exceed these "capacity" numbers. These figures are specified by the state to provide consistent planning across schools and are not updated to reflect current costs and revenue numbers. The new application will need to use these same numbers. Do not mistake them for actual capacity.

## My hope: This simple framework will give us an easy way to think about designing buildings that fit our district

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What I have learned-1								
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<ul> <li>Ignoring the pre-K rooms<sup>*</sup></li> <li>This calculation intentionally keeps everything else in proportion because</li> </ul>								
Option	А	В	С	D	E	Total		
Elem	16	16	16	16	16	80		
Pre-K								
Other	3	3	3	3	3	15		
Total	19	19	19	19	19	95		
						p18		

 $^{*}$  To get the community on board, I think it will be important to talk about the cost of replacing what we have (the K-5) versus adding on the pre-K. It should help make the case that we are getting a lot more for the dollars.

#### What I have learned-2

Modern schools, which is what GMB is appropriately designing for us, already have a lot more space

- The square foot per student is much greater in the GMB school than all of our current schools\*
- To be consistent, I think GMB-24 is the right column to consider—it assumes that the average class size is 24
- Implication 1: Don't pad the student population numbers to get more space—the architects are appropriately putting it in
- Implication 2: Don't specify too many "add-ons" until the modern school is understood \*\*

	GMB	GMB-24	Don	Glen	Marb	Pine	White
Students	360	384	283	303	359	385	326
Sq. Ft.	61408	61408	42,120	35,560	44,490	44,740	38,970
SF/stud	170.6	159.9	148.8	117.4	123.9	108.6	119.5
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\* I am using higher enrollments for the schools than reported earlier because I am now factoring in Dev-K and ECSE. If we're trying to get a sense for crowdedness, that only seems fair. Also, I took the square feet from the previous bond application. I do not know if the figure includes portables.

\*\* As an example, GMB includes 2 special ed classrooms per school, which would give us 10 district wide. Currently we have 4 outside pre-K. Do we have demand for 6 more classrooms? We have demand for larger special ed classrooms, of course, but this is about the number of classrooms. Two of these additional classrooms could be applied to Dev-K. Perhaps these other four classrooms could be dedicated to pre-K. The GMB drawings also include one classroom for Spanish or STEAM. Might that mean that no "add-ons" are necessary?

#### What I have learned-3a

- Five K-5 schools are more easily programmed and are more flexible
  - This example is based on assuming two smaller schools for the small sites, and three larger schools
  - School C is denoted "14(18)" because it has 14 K-5 classrooms and 4 additional pre-K classrooms. If these pre-K classrooms were built with the footprint of a K-5 classroom and with re-K fixtures, then schools A through C can be thought of as interachangable

Option	А	В	С	D	Е	Total
Elem	16	16	12	12	12	68
Pre-K			Yes			
Other	2	2	2	0	0	6
Total	18	18	14(18)	12	12	74
						p20

## What I have learned-3b

Five K-5 schools provide lots of programming flexibility

The superintendent could decide from at least these two options, plus move them around the physical buildings as needed if the schools were built more similarly\*

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Elem161612121268Pre-KYesYesOther00336Total161612(16)151574OptionABCDETotalElem141412141468Pre-KYesYesOther22116Total1612(16)151574	Option	А	В	С	D	E	Total
Pre-K         Yes           Other         0         0         3         3         6           Total         16         12(16)         15         15         74           Option         A         B         C         D         E         Total           Elem         14         14         12         14         14         68           Pre-K         Yes         Ves         Ves         Ves         Ves         Ves           Other         2         2         1         1         6         12(16)         15         15         74	Elem	16	16	12	12	12	68
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Pre-K			Yes			
Total161612(16)151574OptionABCDETotalElem141412141468Pre-KYes6Other22116Total161612(16)151574	Other	0	0		3	3	6
Option         A         B         C         D         E         Total           Elem         14         14         12         14         14         68           Pre-K         Yes         Ves         Ves         Ves         Ves         Ves           Other         2         2         1         1         6         10         12(16)         15         15         74	Total	16	16	12(16)	15	15	74
Option         A         B         C         D         E         Total           Elem         14         14         12         14         14         68           Pre-K         Yes         Ves         Ves         Ves         Ves         Ves           Other         2         2         1         1         6         10         12(16)         15         15         74							
Elem         14         14         12         14         14         68           Pre-K         Yes         1         1         6           Other         2         2         1         1         6           Total         16         12(16)         15         15         74	Option	А	В	С	D	E	Total
Pre-K         Yes           Other         2         2         1         1         6           Total         16         12(16)         15         15         74	Elem	14	14	12	14	14	68
Other         2         2         1         1         6           Total         16         16         12(16)         15         15         74	Pre-K			Yes			
Total 16 16 12(16) 15 15 74	Other	2	2		1	1	6
p21	Total	16	16	12(16)	15	15	74
							p21

\* To be clear, the flexibility arises from many sources:

•The buildings are similar sized, so programming can be shifted between them (perhaps reacting to changes in the distribution of families).

•The buildings are large enough that multiple programming options exist within each building.

•There is flexibility within buildings to shift classrooms around—something that is less likely in a 12 or 13 room school.

#### What I have learned-4

#### ■ Six buildings are not flexible

- We can't have 2 classes per grade in every school
  - All K-5 config: School F is missing four K-5 grades
  - School F made K-3: Sister school is missing two K-3 grades\*
- It takes away possibility of systematically increasing class size from K to 5 as we currently do
- And the point of this exercise is that adjusting the elementary classrooms from 68 isn't an option \*\*

Option	А	В	С	D	Е	F	Total
Elem	12	12	12	12	12	8	68
Pre-K						(Yes)	
Other	1	1	1	1	1	1	6
Total	13	13	13	13	13	9(13)	74
							p22

\* If we stay with a catchment area system, then school F will need to be paired with another school to serve the 4<sup>th</sup> and 5<sup>th</sup> graders. Specifically, suppose School E was paired with School F, so that the K-3 were split between the two schools, but all 4<sup>th</sup> and 5<sup>th</sup> graders then went to School E. The total classrooms serving this larger catchment area is 20. That would mean we could have 3 classrooms per grade, with 2 left over. If we put 2 classes each of K-3 in School F, we would necessarily need 3 classes each of grades 4 and 5 in School E. That would mean there would be 6 classrooms left in School E to serve K-3. Thus, you can't have 2 classrooms of each grade K-3 (which would take 4 classrooms) in School E. Bottom line: The desire to have two grades per class at School F.

\*\* Grow School F to 12 elementary classrooms would add 96 students to our elementary system (=4 x 24), which will push 48 more students into the middle school and grow our SOC by over 200 students long term (96 in grades K-5, 48 in grades 6-8, and 64 in grades 9-12).

#### Where I am

- K-5 schools that fit ELPS should cost appreciably less than \$75m
  - Even 5 of the GMB school are too big
  - This statement is likely to be true even if we built 6 smaller schools
- Five K-5 schools are easily programmable, but six are not
  - I've tried to fit the puzzle pieces together and I cannot—I'd be happy to be proven wrong
  - Perhaps rehabbing Red Cedar for MSU childcare needs is the best use of the sixth site if six sites are to be used

Let's design with room for growth

- We are unlikely to see appreciable growth, but we could—so let's build schools that allow for it
- Little reason to pay M&O on such space until we need it

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# **Appendix Material**

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# 2016/17 enrollment and class rms

Students per grades	5,54	0.005	2000				
	K	1	2	3	<u>4</u>	<u>5</u>	Total
Donley	43	35	48	41	43	56	266
Glencairn	50	49	46	49	50	59	303
Marble	63	52	73	59	55	57	359
Pinecrest	67	62	69	54	76	57	385
Whitehills	42	54	50	62	52	55	315
Total	265	252	286	265	276	284	1628
Teaching units per grade							
	K	1	2	<u>3</u>	<u>4</u>	<u>5</u>	Total
Donley	2	2	2	2	2	2	12
Glencairn	2	2	2	2	2	2	12
Marble	3	2	3	2	2	2	14
Pinecrest	3	3	3	2	3	2	16
Whitehills	2	3	2	3	2	2	14
Total	12	12	12	11	11	10	68

This table comes from \*\*\*



\* To facilitate districts that choose to renovate buildings, there is a way to use bond proceeds to cover some capital-related operating costs through the establishment of a "sinking fund"

\*\*This breakdown is not exact. For example, bigger schools often build bigger libraries. Still, for planning purposes, it is useful to keep in mind that some costs increase by the number of schools that are built.

\*\* These percentages are district wide, not just K-5, and are for 2014/15. Some of the 20% other is for labor services that are outsourced ("other purchased services"), so the 80% number is probably low. Here is district wide information that breaks it down by source:

- http://elps.us/downloads/budget\_transparency\_-\_current\_operating\_expenditures/operating\_expenditures1415.pdf
- http://elps.us/downloads/budget\_transparency\_-\_personnel\_expenditures/personnel\_expenditures1415.pdf.



NOTE: These numbers are based on providing pre-K services for the school year, 8:30 to 3:30. If these services were expanded to be more like childcare, covering 50 weeks of the year and from 8 to 5, both the costs and revenues should be adjusted upward appropriately.

\* Keep in mind that GS and HS children are poor/disadvantaged families, meaning that these students are less likely to go to preschool. Thus, the subsidy of \$3.2K for GS and HS delivers a full \$10K of services to a child that might not otherwise go to pre-school, whereas the subsidy of \$3.7K to non-poor families through fee-based service is more likely to displace other pre-school services.

\*\* I could not put my hands on Head Start grant level. I have heard it is more than Great Start and less than Great Start. I simply assume Great Start level because I don't have better information.

\*\*\* Radmoor charges \$6,345 for FT in 2016/17.