ABSTRACT

Title of Document:	EXPLORATIONS IN SUBURBAN HIGH SCHOOL DESIGN: UNCONVENTIONAL SITING
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Thesis Directed By:	Assistant Professor Isaac Williams, School of Architecture, Planning, and Preservation

This thesis proposes a design strategy and solution for a suburban high school prototype sited along commercial highway MD40 in Baltimore County, MD. The goal of the thesis is the design of a comprehensive high school that promotes unconventional site selection; mitigates the highway's urban role as community divider; is endowed with civic dignity; and becomes a fulcrum for strong design in the community.

The MD40 site offers unique opportunities. It bears the stigma of being a socio-cultural dividing line as well as a physical barrier. The surrounding region is also a target for large-scale development related to expansion at a nearby military research base. The program is focused on the workforce education needs of the military research base. Science and technology courses appropriate for this focus have been added to the curriculum along side the traditional trade and liberal arts.

EXPLORATIONS IN SUBURBAN HIGH SCHOOL DESIGN: UNCONVENTIONAL SITING

By

Adam Scott MacDonald

Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Architecture
2008

Advisory Committee:
Assistant Professor Isaac Williams, Chair
Associate Professor Isabelle Gournay
Professor Karl DuPuy, AIA

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~Adam MacDonald

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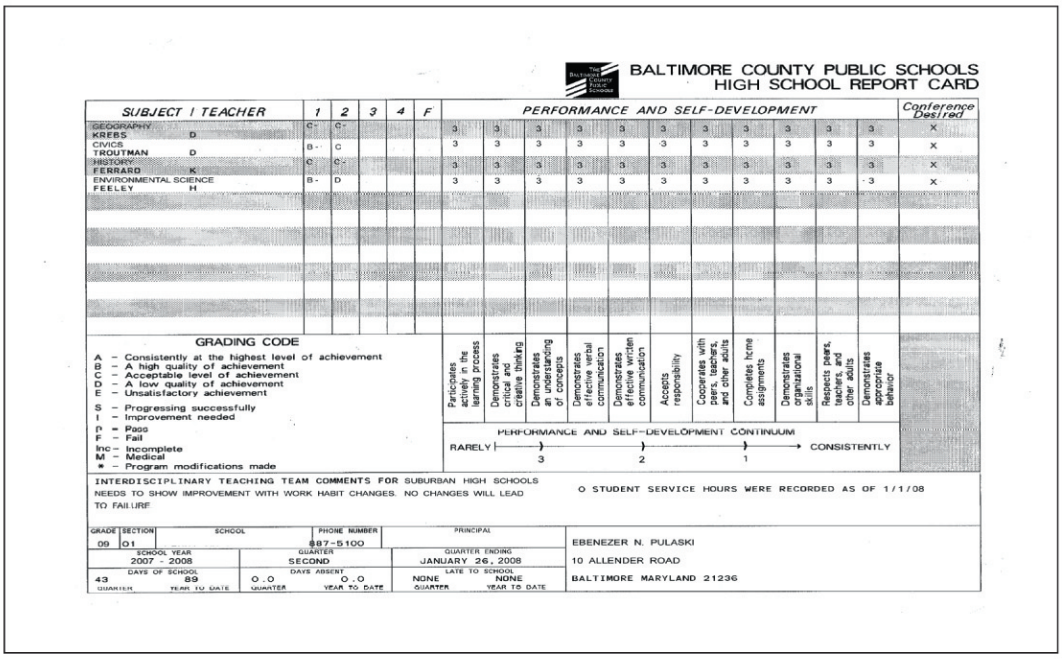
Chapter 1: Introduction

The following thesis composition is a component, along with presentation graphics, of an exploration into suburban high school design. Included in this composition are chapters outlining the historical pedagogies associated with the school type, analyses and speculation into proper programming and siting of a unique school in Baltimore County, precedent studies used to spur on the design process, and verbal and graphic evidence from the design process itself. Concluding remarks are included to act as a bookend to this two-semester process of research and design.

The primary goal, as will be addressed further in following chapters, is an exploration into alternative methods of siting and massing a full-size high school to make it more viable in a time where land and energy are becoming increasingly scarce. The hope is that the solution proposed in the following chapters is one that could be studied, tweaked, and applied to a number of scenarios all across the country, beginning with the selected thesis site in Baltimore County, MD.

Chapter 2: Performance and Expectations of the 21st Century Suburban High School



BALTIMORE COUNTY PUBLIC SCHOOLS
HIGH SCHOOL REPORT CARD

SUBJECT / TEACHER	1	2	3	4	F	PERFORMANCE AND SELF-DEVELOPMENT												Conference Desired
						Participates actively in the learning process	Demonstrates critical and creative thinking	Demonstrates an understanding of concepts	Demonstrates effective verbal communication	Demonstrates effective written communication	Accepts responsibility	Cooperates with peers, teachers, and other adults	Completes home assignments	Demonstrates organizational skills	Respects peers, teachers, and other adults	Demonstrates appropriate behavior		
GEOGRAPHY KREBS D	C-	C-				3	3	3	3	3	3	3	3	3	3	3		x
CIVICS TROUTMAN D	B-	C				3	3	3	3	3	3	3	3	3	3	3		x
HISTORY FERRARD K	C	C-				3	3	3	3	3	3	3	3	3	3	3		x
ENVIRONMENTAL SCIENCE FEELEY H	B-	D				3	3	3	3	3	3	3	3	3	3	3		x

GRADING CODE

A – Consistently at the highest level of achievement
B – A high quality of achievement
C – Acceptable level of achievement
D – A low quality of achievement
E – Unsatisfactory achievement

S – Progressing successfully
I – Improvement needed

P – Pass
F – Fail
Inc – Incomplete
M – Medical
* – Program modifications made

PERFORMANCE AND SELF-DEVELOPMENT CONTINUUM

RARELY 3 2 1 CONSISTENTLY

INTERDISCIPLINARY TEACHING TEAM COMMENTS FOR SUBURBAN HIGH SCHOOLS
NEEDS TO SHOW IMPROVEMENT WITH WORK HABIT CHANGES. NO CHANGES WILL LEAD TO FAILURE

0 STUDENT SERVICE HOURS WERE RECORDED AS OF 1/1/08

GRADE	SECTION	SCHOOL	PHONE NUMBER	PRINCIPAL
09	01		887-5100	EBENEZER N. PULASKI

SCHOOL YEAR	QUARTER	QUARTER ENDING	10 ALLENDER ROAD
2007 - 2008	SECOND	JANUARY 26, 2008	BALTIMORE MARYLAND 21236

DAYS OF SCHOOL		DAYS ABSENT		LATE TO SCHOOL	
43	89	0.0	0.0	NONE	NONE
QUARTER	YEAR TO DATE	QUARTER	YEAR TO DATE	QUARTER	YEAR TO DATE

Fig. 2-01: Report Card of Suburban High School Design.

Comments

Over the course of the last fifty year semester, suburban high school design has underperformed in a number of disciplines, consistently producing work commensurate with the substandard marks outlined above. The gravest concern and area of most dysfunction is geography. Here, the design of the suburban high school has shown two specific and troubling deficiencies. First, when selecting a site, school planners have often demonstrated a preference for, or even mandated the selection of, parcels of land of a size that are completely incongruous with the amount of program ultimately constructed. The result of this poor work habit is that there simply are no more properties of size available that can accommodate a school of "conventional" design, even in the suburbs.

Fig. 2-02: Aerial photograph of Eastern Technical High School in Essex, MD [Windows Live Local]. The sprawling nature of this school's built area and parking lots is characteristic of conventional suburban school design.

Second, a site being duly selected, the manner of site design that resonates with school planners is one that uses up as much of the site as possible, while architecturally engaging as little of it as possible. The proof of this assertion is in the hundreds of suburban one-story high schools in America marooned among alternating oceans of grass and asphalt and clinging to a meandering bus loop lifesaver as the only means of connection to a community drifting out of reach. Failure in this area will dictate failure in all areas as the current semester continues and the following semester begins.

High school design is also in need of marked improvement in three other classes required for graduation. In *civics*, a failure to work well with others has

become a major hurdle. The conventional high school chooses to distance itself from its student catch basin, fueling problems of communication between the school and the neighborhoods it serves. Good attendance in the community architectural forum is belied by the fact that the typical high school does not participate or contribute anything meaningful to the discussion, often leaving as a face in the crowd with no memorable or distinct presence. Likewise in *history,* high school design carries itself with an attitude of disrespect to the social and cultural meanings its typology and context can carry. In *environmental science*, high school design is failing to apply acquired knowledge to new problems. To date, high schools have continually tried to repeat and regurgitate principles explored early on in the semester. Stagnant work habits like these will lead to failure in addressing issues of energy conservation and ecological preservation that are the crux of this semester's final exam.

The Nature of the High School Typology

Familiar teacher chidings like these accentuate the elementary foolishness of a few of the prevalent architectural shortcomings in high school design. This is not an exaggerated simplification. However, if the issues are as rudimentary as suggested, from where does the difficulty in addressing them come? In many ways, it is simply a consequence of what a school is and what it must do; that is, its *typology*.

By nature of this *typology*, schools bear burdens, ones that are made all the more heavy by legislative, political, and financial water-logging. A high school

must provide for the safety and well-being of near 2000 users each day in a controlled, comfortable indoor environment. It is called on to be constructed with durability appropriate for a fifty year life span, but also with flexibility to thrive amid changes in population and curriculum. By type, a high school is asked to encourage and help nurture all the users through its design. But these same users often feel themselves a captive participant and would rather vandalize their school than care and maintain it. Truly, these practical issues must be navigated, and hundreds of suburban high schools have already proven they can be. However, the architecture of the solutions often merits the marks of our introductory report card. They choose quantity of site over quality. They do not "work well" with their surroundings or respect the context in which they are placed. They are loud in size, but say nothing. They do not apply what they have learned to new problems of culture and environmental stewardship. In short, they fail the final exam.

This thesis is a study session to prepare for the next test, be it a scheduled exam or a pop quiz. For either scenario, the best course is to be constantly reflecting on and relearning these elementary rules of education and architecture. The case study for this session is a new comprehensive high school to be located and designed as most appropriate for a site along the MD40 corridor of Baltimore County, MD. The output of this case study will be the preparation and compilation of analytical and speculative graphics and verbal arguments in the areas of program, site, and (less formally) precedent analysis. From these explorations, three design strategies will be created and weighed for their

appropriateness and potential, one being ultimately selected, or amalgamated if appropriate, for more in-depth investigation via a full scale design effort. Begin.

Chapter 3: Program

Overpopulation in Baltimore County, Now and in the Future

The construction of a new high school is a costly endeavor and one that, evidence shows, school boards will bend over backwards to avoid. Consider as proof how the portable classroom, or "trailer", is so longstanding and ubiquitous a solution for all degrees of fluctuation in suburban high school populations. What this sentiment stands to highlight, however, is that any proposed high school must be vehemently motivated by some outside force(s) to overcome hesitation to build. The landscape of northeastern Baltimore County near the MD40 corridor, the site for this case study, is one such location where a strong impetus currently exists and an even stronger push is coming directly.

To administrative bodies involved with schools, the number of students in a school compared to the school building's "state rated capacity" is the definitive measure of the need for a new building (were it some other factor, such as adequacy of heating and air conditioning systems to promote a comfortable learning environment for the students, dozens of schools across the state could be closed and replaced today). In northeastern Baltimore County, there are four conventional, public high schools ("magnet" schools not considered conventional): Loch Raven High School, Perry Hall High School, Kenwood High School, and Chesapeake High School. According to enrollment data from the beginning of the 2006 school year, Loch Raven is operating at 121% of its state rated capacity, Kenwood at 120%, Perry Hall at 109%, and Chesapeake at 100%

High School Enrollment, September 30, 2006
Baltimore County, Maryland

School Name	School Number	9/30/06 FTE	State Rated Capacity (SRC)
Carver Center	0975	718	766
Catonsville HS	0174	1,689	1,685
Chesapeake HS	1574	1,085	1,083
Dulaney HS	0872	1,962	1,984
Dundalk HS	1273	1,342	1,538
Eastern Tech HS	1575	1,250	1,380
Franklin HS	0472	1,578	1,647
Hereford HS	0772	1,393	1,230
Kenwood HS	1572	1,847	1,527
Lansdowne HS	1371	1,278	1,420
Loch Raven HS	0973	1,189	975
Milford Mill HS	0271	1,567	1,315
New Town HS	0473	1,037	1,348
Overlea HS	1473	1,331	1,230
Owings Mills HS	0452	1,110	1,147
Parkville HS	0972	1,987	2,037
Patapsco HS	1272	1,620	1,302
Perry Hall HS	1171	2,303	2,110
Pikesville HS	0371	1,033	1,028
Randallstown HS	0272	1,276	1,444
Sparrows Point HS	1573	836	850
Towson HS	0971	1,461	1,260
Western HS	0175	977	1,121
Woodlawn HS	0172	1,960	2,129
Total for High Schools		33,829	---

FTE: Full Time Equivalent
SRC: State Rated Capacity

: Notes:

+ Perry Hall High School has 193 too many students.
+ Kenwood High School has 320 too many students
+ Loch Raven High School has 214 too many students
+ Chesapeake High School has 2 too many students
+ 729 too many students total AND 599 from new developments on the books = NEW SCHOOL at least 1328 in population

Table 3-01: Baltimore County High School Populations. These numbers are the crux of the argument for a new school, especially considering the 90% occupancy is considered by the Baltimore County Public Schools to be "overcrowded."

(see Table 3-01 for additional information). A 2003 report commissioned by Baltimore County on the same student population concerns being examined in this thesis provides some perspective on the level of inappropriateness of these conditions. The Board of Education of Baltimore County Public Schools defines a school as "overcrowded" if it is operating above 90% of its state rated capacity. The State of Maryland, as an entity, is only slightly more forbearing of the problem, defining overcrowding at operations above 95% of the state rated capacity. Baltimore County, as an entity, sets their mark at 115%. If one were to "split the difference" of these measuring sticks and compare a school's population to 100% of its state rated capacity, the resulting excess of students from the four schools listed would total 729 students. This begins to demonstrate the need for a new high school in northeastern Baltimore County, but it is only the first of three bullets to be fired.

[Addendum: Since the writing of this thesis, Baltimore County has collected and published its enrollment numbers for the 2007 school year. The updated data for the four schools highlighted above is as follows: Loch Raven High School's operations dropped from 122% to 113%, Perry Hall High School's from 110% to 109%, Kenwood High School's from 121% to 117%, and Chesapeake High School's from 100% to 95%. All remain above state standards for overcrowding]

The second arrow is related to the influx of more students to the high school system due to new residential developments currently under construction. Baltimore County annually compiles a listing of the estimated number of pupils to

be yielded to individual high schools by new developments. According to this list, new developments are slated to fill Perry Hall, Loch Raven, Kenwood, and Chesapeake high schools with an additional 599 new students. Couple this number with the total due to current overpopulation and the new sum of students without a properly populated high school environment awaiting them is 1328. That total alone is as much or more than the state rated capacity of half (12 out of 24) of the high schools in Baltimore County. That number, however, only reflects developments that are "on the books." The third arrow is the fatal blow to any who would oppose the great need for a school sited in line with this thesis.

In 2005, the Department of Defense examined the operations of military facilities throughout the country. In an effort to streamline the work of these bases and to save the federal government billions of dollars in operation funding, propositions were made under the program heading of "Base Realignment and Closure", or BRAC. One of the bases affected by this initiative is Aberdeen Proving Ground, a military research base located along MD40 about 17 miles northeast of the region under investigation in this thesis. Due to the dramatic expansion of programs at this base, a predicted 50,000 to 75,000 people are expected to be migrating to the region to fulfill the bases workforce needs. As a result, Baltimore County, Baltimore City, Harford County, and Cecil County are each formulating action plans to accommodate this huge incoming population (see Appendix # for excerpts from these action plans). The potential pupil yield over the next five years in the specific corridor at which this thesis is looking will be

staggering. In the end, one new high school, as this thesis proposes, will likely not be enough.

A Need-Based Curriculum

These omens dictate the need for a new high school facility, but what sort of curriculum should this facility provide? Should the facility respond directly to the needs of Aberdeen Proving Ground, grooming a future horde of science and technology savvy military employees? The answer is no. A sentiment such as this would be short-sighted. Consider the population density of Baltimore County as represented in Figure #-#. The map indicates that Baltimore County's population gravitates first and foremost around the metropolitan area, as one would expect, then creeps outward along major thoroughfares. The "finger" of density pointing to the northwest follows Interstate 70. The "finger" to the north follows Interstate 83. Interstate 95 and its historical predecessor and neighbor, MD40, reach out to the northeast, yet there is no "finger" of population following…yet. But there will be. This prediction is very plausible in that as a "finger" of density gets further from the metropolitan area from which it was spawned, it will lose its accessibility appeal and a new finger will be formed to reap the benefits of the metropolitan center. Couple this with the development that must happen by 2011 to support the BRAC initiatives and it is certain that the whole region will become a hotbed for development. This all serves as a long-winded explanation to the one-word answer regarding curriculum given above. A high school located in this region will need to support the growth of an entire community, not simply the engineering and medical needs of Aberdeen Proving

Ground. To this end, the curriculum that is needed is one that is fully comprehensive in liberal arts and career (or vocational, to use an old term) education. The appropriate curriculum to be created is one that provides the student the opportunity to pursue a career in support of Aberdeen Proving Ground or aid in the construction of buildings for the new flood of buildings destined for the region or serve the thousands of people who will call this region home in five years. The proposed program (see Appendix #-#) is based on this assertion and is categorized using the Maryland Career and Technology Education (CTE) system of career clusters as published by Maryland Public Schools. As a closing remark, the program should be, above all other things, proactive. A program strategy designed to create a positive future will create a positive future.

The Kit of Parts

Architecture is meaningless if it does not apply theory and conviction, like the above, to built form. The following figures, including notes, sketches, and precedent images are a means of making this marriage of theoretical analysis and practical examples visual.

: Cafeteria :

[A] Shape By itself can be any shape in plan, but if it has a multipurpose function it should be more geometric to allow for flexible use

[B] Volume Space allows for an expressive mass/roof line; high bay preferred

[C] Adjacency Must be attached to kitchen… kitchen is attached to service which is at grade and in the "back"

[D] Safety Surveillance is important…several enclosed dining areas are discouraged

[E] Use Cycle Has developed into a space that is pretty consistently used throughout the day with a number of lunch shifts and early morning/after school uses

Accommodates extreme loads for performances/ assemblies/etc… consider design to passively mitigate this use as doing it systemically may cause overbuilding

[F] Orientation Accommodates all orientations as east and west light can be admitted easily through windows above eyelevel

[G] Systems High bay lighting
Large ducts, can be exposed architecturally
Large bay spaces mean deep beams or trusses

[H] Other Acoustics are important here as this is a loud space…plan it into the massing ahead of time

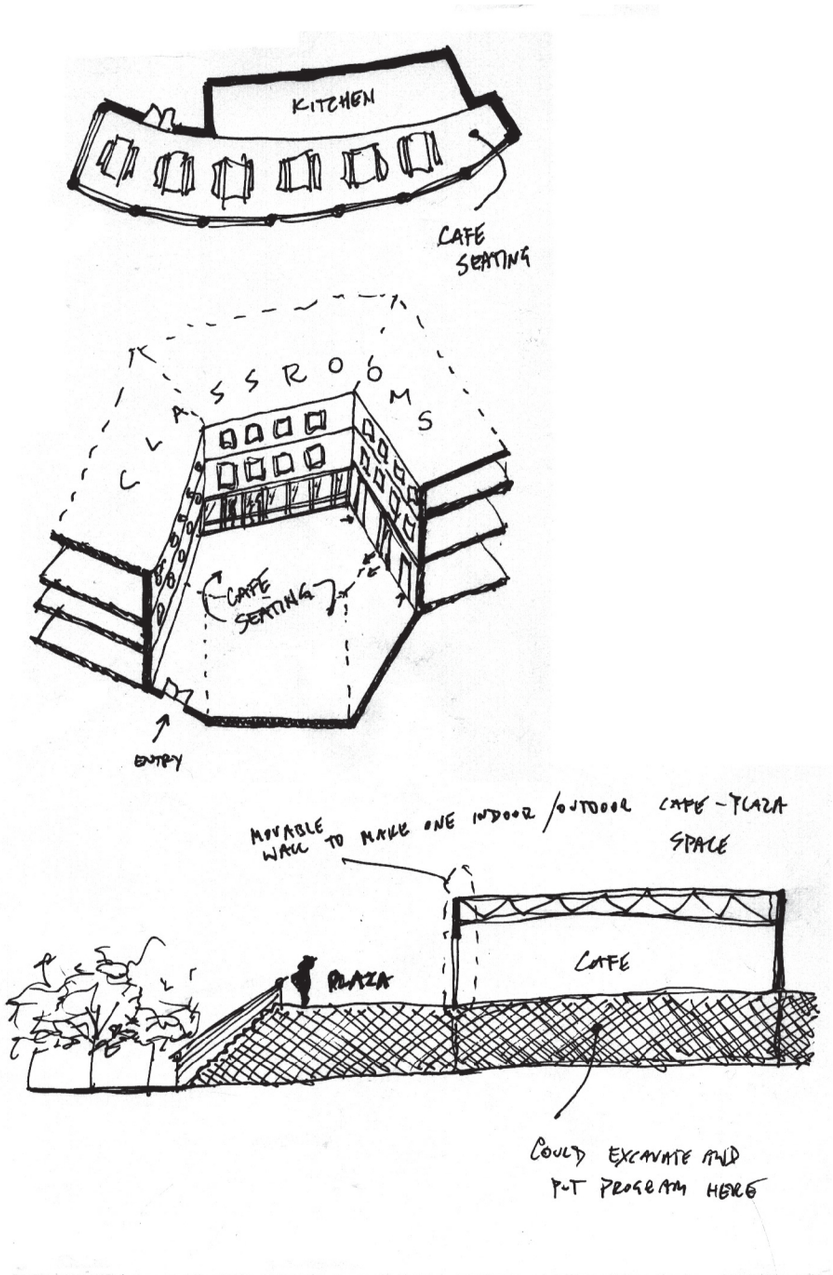


Fig. 3-02: Notes, sketches, and example images - Cafeterias.

: Administration Suites (Office, Guidance, Nurse) :

[A] Shape *CAN* be freely planned as there isn't a liturgy to the activity that happens there...*BUT* wants to be organized with a double loaded corridor diagram for optimum efficiency of space

[B] Volume Low ceilings acceptable, probably preferred for acoustics/HVAC purposes

[C] Adjacency Needs to be near main entry for security purposes, deliveries, and visitors

Needs two ways in for dead end conditions and to allow faculty to enter privately

[D] Safety Windows in administrator offices offer token protection from belligerent parents

[E] Use Cycle Year round, all day...amount of users steady

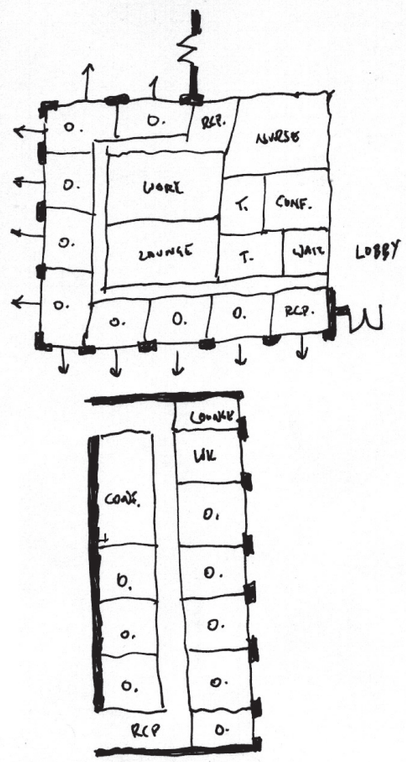
[F] Orientation Wants as many faces with natural light as possible to get windows into offices...N, S, E preferred

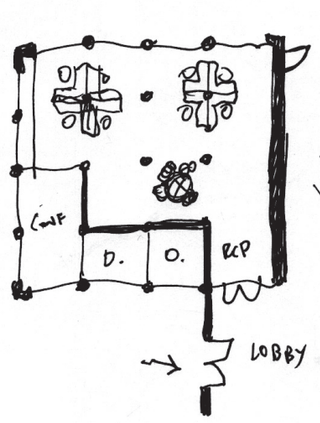
[G] Systems Consider a separate HVAC zone for this area as admin has users year round while the school does not

Durability of walls not as big a deal here as in kid areas so gypsum board on studs is acceptable/preferred

[H] Other Everyone wants a window but it's almost impossible to accommodate it, so politics of who gets one comes into play...maybe toplighting helps here

All admin being consolidated in one area seems smart for resource sharing, security, but sometimes guidance and admin consider themselves separate bodies





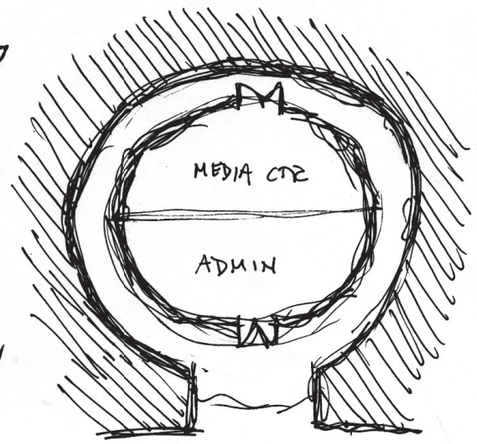


Fig. 3-03: Notes, sketches, and example images related to administration suites.

: Liberal Arts Classroom :

[A] Shape Reflects pedagogy one posits for teaching techniques now and in the future

All one size or varied sizes?

Flexibility important so different subjects can use it

[B] Volume 9'-10' ceiling/bottom of structure probably ideal for sound, interest, and efficiency on the whole building scale

[C] Adjacency Similar classes are often clustered with one another; pedagogy dictates if by subject or grade or other

[D] Safety Teacher needs to be able to see everything

800sf classroom has occupancy of 40...these add up real fast, so fire egress is very important to plan for in the beginning

Doors and corridor glazing need to reflect prevention of mass shooting incidents (gunman can't see in a room)

[E] Use Cycle Steady load, 5 days a week, 8 hours a day

[F] Orientation N, S ideal, but any kind of daylight is what matters

Historically has a front, back and sides

[G] Systems Design for technology systems moving forward (ex. busway around room)

Durable walls important...often leads to 8" CMU

[H] Other Acoustics are important here

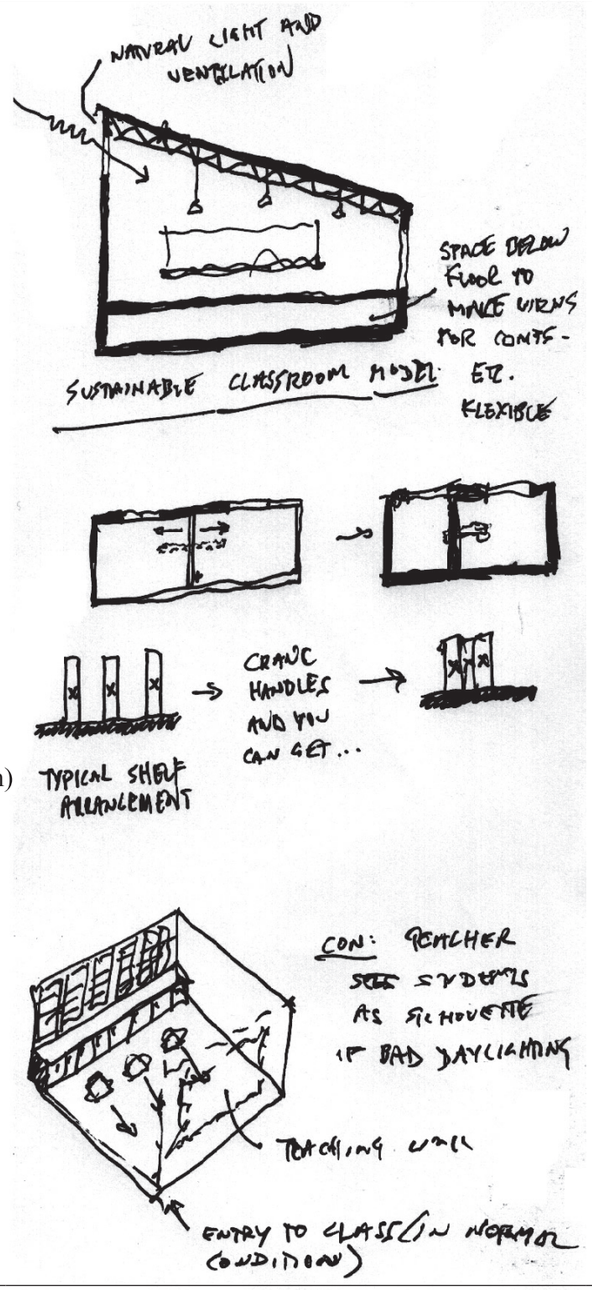


Fig. 3-04: Notes, sketches, and example images related to liberal arts classrooms.

: Gymnasium :

[A] Shape Dictated by the shape of basketball courts, mainly

[B] Volume Space allows for an expressive mass/roof line; high bay preferred

[C] Adjacency Near playing fields and other gym functions (locker rooms, storage, wrestling rooms, etc.)

Want to be able to get into it after hours while still keeping the building secure

[D] Safety Surveillance by teacher is adequate.

Huge occupancy numbers dictate that it be at grade

[E] Use Cycle Used relatively infrequently in many schools during school hours as physical ed. has become a one, maybe two, year elective

Accommodates extreme loads for performances/ assemblies/etc… consider design to passively mitigate this use as doing it systemically may cause overbuilding

Would be a great resource for free community use after hours

[F] Orientation Accommodates all orientations as east and west light can be admitted easily through windows above eyelevel

[G] Systems High bay lighting
Large ducts, can be exposed architecturally
Large bay spaces mean deep beams or trusses

[H] Other Acoustics, durability

Fig. 3-05: Notes, sketches, and example images related to gymnasia.

: Career Program - Arts, Media, and Communication :

[A] Shape	Not prescribed
[B] Volume	Printing/graphics lab needs to be high bay to accommodate the large old style printers; web design courses can be low bay
[C] Adjacency	Career programs adjacent to one another; wants to be near other creative technologies like engineering or manufacturing
[D] Safety	Surveillance of machine work and computer content Space must be rated appropriatelyas there are a lot of flammable chemicals involved here
[E] Use Cycle	Probably used half the day
[F] Orientation	No direct sunlight to computer labs (glare and heat gain)...north light or high east windows only Daylight is desirable for proper color perception Media functions need to be able to be darkened for video stuff
[G] Systems	Ventilation must be considered both passively and systemically for fumes A lot of power, data, and flexibility needed
[H] Other	This program is great advertising for the school, so getting their work out in front of people is smart Aesthetically, an industrial look is acceptable in here

Fig. 3-06: Notes, sketches, and example images related to the Art, Media, and Communication Career cluster.

: Career Program - Business, Management, and Finance :

[A] Shape	Not prescribed...which means get creative
[B] Volume	Low ceiling acceptable
[C] Adjacency	No real factor prescribing adjacency...business iconography might want to locate it on a top floor as the "penthouse" is the goal of entrepreneurs Associate with other careers over liberal arts
[D] Safety	Not an issue
[E] Use Cycle	Probably gets a full days use as computer labs and conference rooms could have many uses This is a potential space saving area...business has no specific infrastructure, so anybody can use its space...could business and media center be joined somehow?
[F] Orientation	Similar to classrooms...no glare and allow for darkening
[G] Systems	A lot of power and data needs...definitely want to consider space in floor for maximum flexibilty in computer arrangement, etc.
[H] Other	none

Fig. 3-07: Notes, sketches, and example images related to the Business, Management, and Finance Career cluster.

: Career Program - Cosmetology :

[A] Shape	Shape dictated by equipment (stations, dryers, sinks); these are often clustered or linear
[B] Volume	Architectural interest would be appropriate, but height not critical
[C] Adjacency	Outdoor access for community clients and deliveries Smell makes it so no one wants to be next to it
[D] Safety	Surveillance is important for safety
[E] Use Cycle	Half day, most likely...5 days a week
[F] Orientation	Not critical...natural lighting desirable for true color of hair dyes
[G] Systems	Ventilation, perhaps special lighting...a lot of power for dryers, etc.
[H] Other	THE most popular major, it seems like, wherever you go Students also require unique storage in either their hallway locker or a special additional locker to hold their mannekin heads and cosmo “boxes” Laundry services in room or in close proximity a must.

Fig. 3-08: Notes, sketches, and example images related to cosmetology.

: Career Program - Construction Trades :

[A] Shape Rectangular for flexibilty and so there are no hidden corners that subvert good surveillance

[B] Volume High bay

Mezzanine floor for storage an option if designed from beginning (must meet any applicable ADA)

[C] Adjacency Adjacent to one another for noise consolidation and cooperative efforts on combined trade projects (i.e. build a small house)

Needs to be adjacent to construction yard area

Programmatically may fit well next to engineering/manufacturing; auto trades frequently a neighbor as well

[D] Safety Architecture-wise, good visibility, good ventilation, good surveillance makes for a well run lab; if present, place teacher office between classroom and lab with vision glass into both

[E] Use Cycle Half day, 5 days a week...a weekend program with do-it-yourself tutorials would be a good idea

[F] Orientation Accommodates all orientations as east and west
light can be admitted easily through windows
above eyelevel

[G] Systems High bay lighting
Large ducts, can be exposed architecturally
Large bay spaces mean deep beams or trusses

[H] Other It's loud.

Lot of unique waste products.

Most rooms need fire rating or separation by code.

Fig. 3-09: Notes, sketches, and example images related to construction trades.

Chapter 4: The Site

Regional observations of the site

Appropriate site analysis is most thoroughly attacked as a two-fold, dual scale enterprise, the first cog of which is observation at the regional scale. The MD40 corridor within Baltimore County has a reasonable connection to four major metropolitan areas. The connection to Baltimore is the most overt. Geographically, it is the closest of the four urban centers to the site, being completely enveloped by Baltimore County. Of the four, Baltimore alone is penetrated directly by MD40. Mean commute times intimate most residents of the region do their work in Baltimore. Baltimore Ravens and Orioles flags fly from cars and hang on front porches. Less forceful is the gravity of Washington, DC. Washington is approximately fifty miles from the site, but is accessible straightaway by MARC commuter train line or Interstate 95. Considerable distance but relatively direct accessibility also characterizes the impact of Philadelphia, to the northeast, and Harrisburg, to the north.

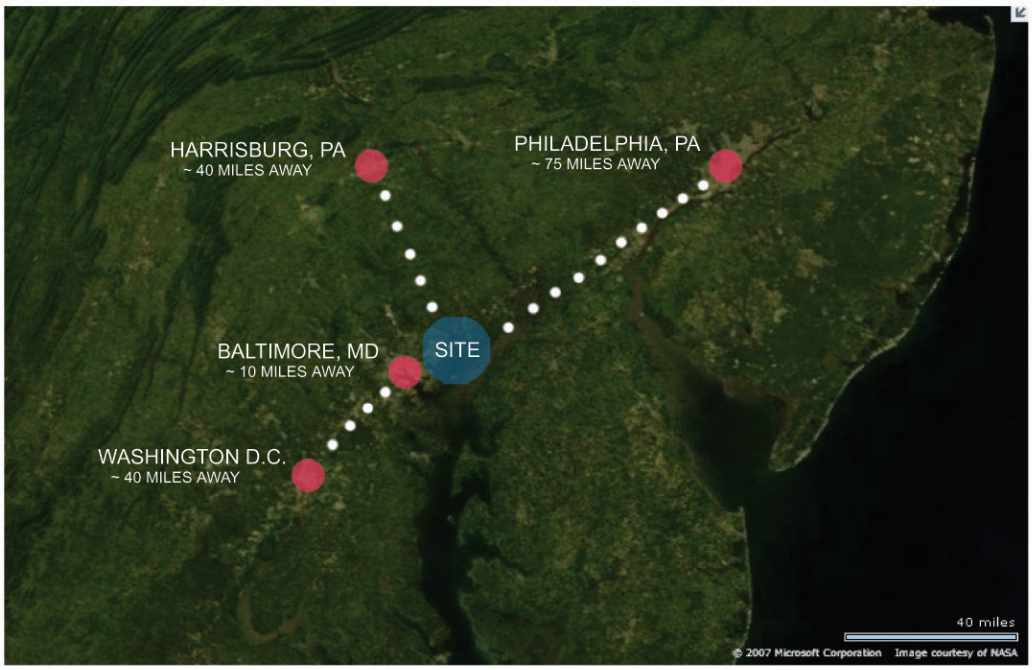


Fig. 4-01: Satellite Photo of the Midatlantic region. The proposes site is in reachable proximity to four major metropolitan areas with different identities. Many of the students in this new high school will end up in or around one of these cities.

In addition to these determinants of built form are two natural determinants: the Chesapeake Bay and Gunpowder State Park. The former is a double-edged sword. Waterfront sites on the bay or its inlets provide compelling sites with compelling views. Also, more than any of the urban influences mentioned above, it is the water and the culture of boating and crabbing that define the region. Negatively, however, the water acts as a physical barrier between communities. Realities of flooding also need to be addressed if one is going to build in the area. The latter natural determinant is unilaterally positive, as it provides hiking trails and opportunity for tubing and picnicking a manageable five miles away from the potential school sites. Though no more unique to the Baltimore County MD40 corridor region than any other Chesapeake Bay watershed site, the climate is important for tempering speculation and design ideas. Hot, humid

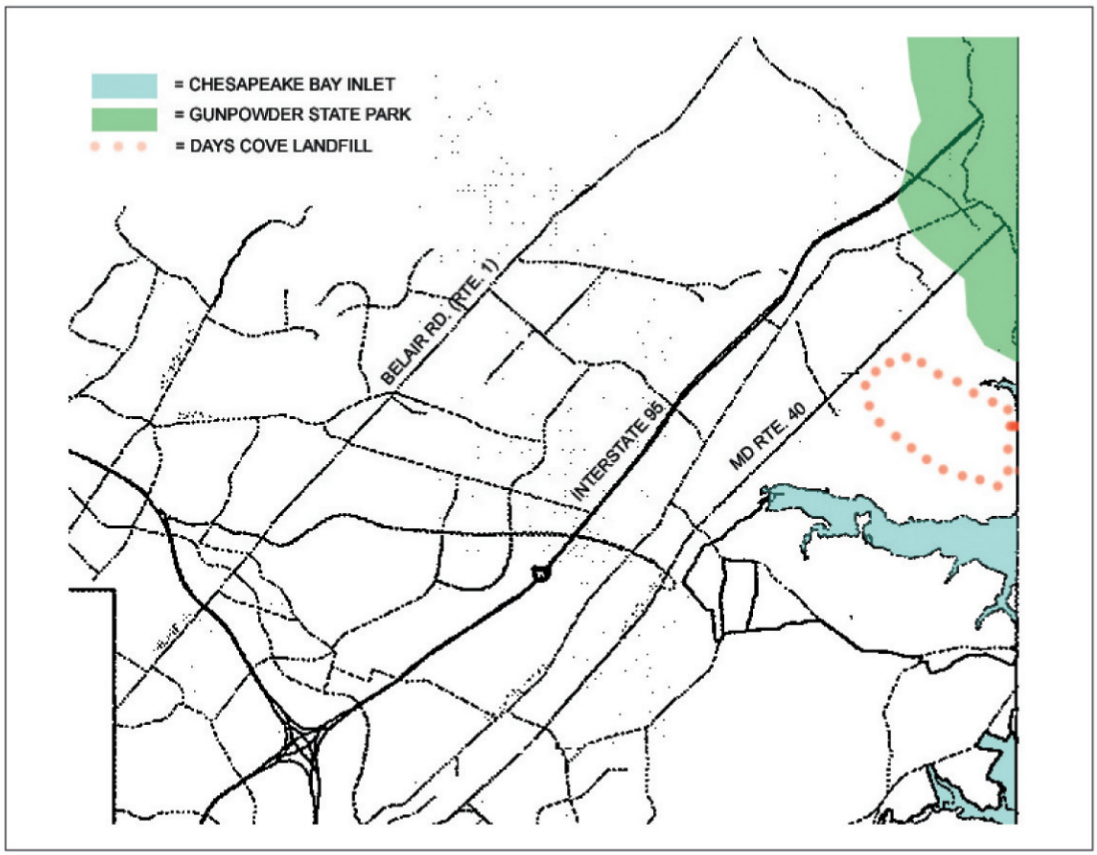


Fig. 4-02: Natural determinant diagram, Eastern Baltimore County, MD. There are three natural site selection determinants in the region. The water and park are both amenities while the landfill can be considered open space held in trust for later use.

summers become cold, wet winters. Prevailing winds are from the northwest from October to June, and from the southwest the remainder of the year. Research into the microclimate of the region does not appear to support a strong impact of the bay on these prevailing winds.

The roads and transit systems that run alongside and through these urban and natural environments add another dimension to site selection. The region is defined by three thoroughfares running northeast-southwest: Interstate 95, MD40, and Rte. 7 (known as Philadelphia Rd. in this community). The interstate is the largest in width and traffic load, followed by MD40. MD40, however, is most significant historically as it was part of the original 1920's national highway system and was the first cross-country highway, stretching from Atlantic City to California.

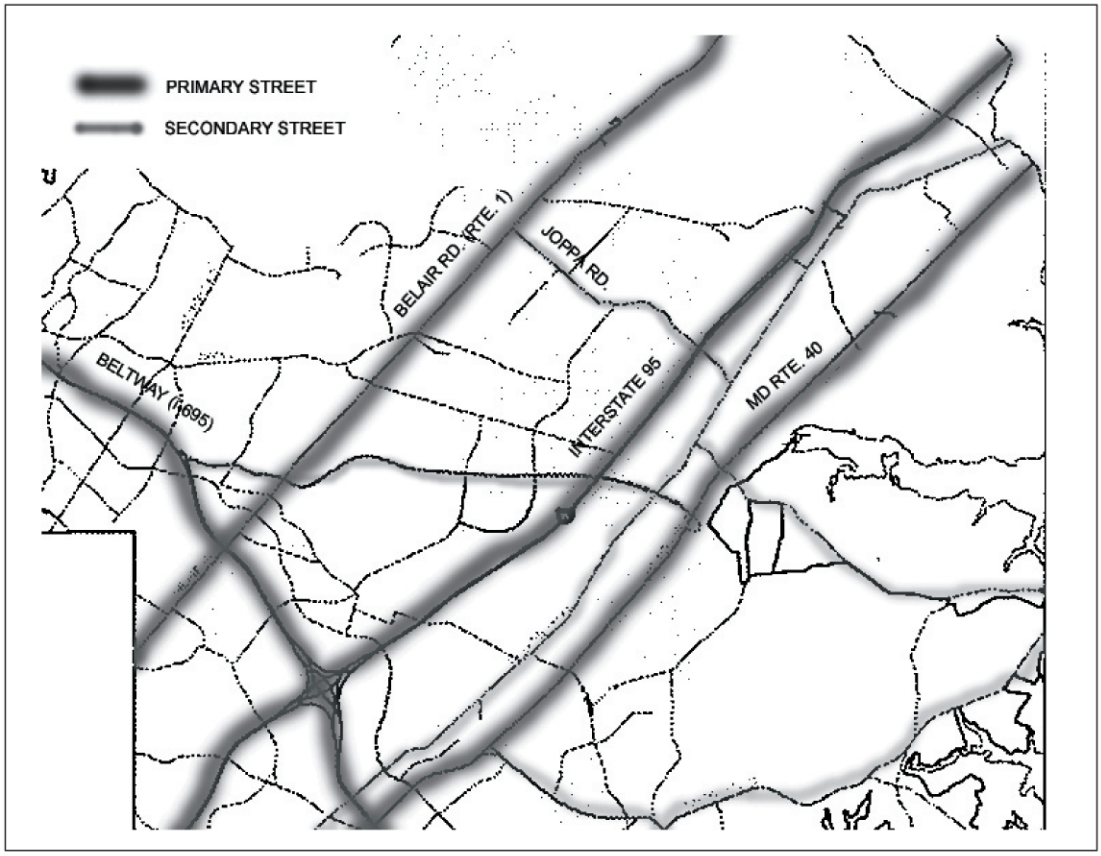


Fig: 4-03: Street type diagram, Eastern Baltimore County, MD. All the primary streets flow northeast-southwest. There a too few secondary streets and they don't promote connection to the primaries.

Today, MD40 has become primarily a commercial and commuter highway, carrying a large volume of local traffic and interstate overflow but possessing little architectural character and a negative identity. Connectivity of communities and hubs is also a seminal factor to evaluate. Interstate 95 has few access points in this area, making it more of a barrier than a connector. MD40 is crossed only by a few choice roads, the most prominent being Ebenezer Rd. Ebenezer Rd. connects the community of White Marsh to MD40 from the north and the communities of Chase and Bowley's Quarters to MD40 from the south. Standing alongside these roadways (figuratively, not literally) are three train stations through which the commuter MARC train runs. The nearest station is approximately five miles to the southwest, with the other two stations habiting sites of a greater distance away to the northeast.

Before selecting an appropriate site for a new high school, a last set of regional observations must be cited: the locations and situations of the current high school facilities. The nearest facility is Perry Hall High School, about three miles to the northwest. Perry Hall is, as was noted, at 109% of its state rated capacity and historically has always been overcrowded. Perry Hall is purely a community high school, though the area of its catch basin is large. Kenwood High School is the next closest facility, four miles to the south west. Kenwood, again, is overcrowded to the tune of 121%. It is primarily a community high school, though it is home to the highly esteemed International Baccalaureate program that attracts and caters to the gifts of the county's strongest students. Kenwood High School's catch basin is split into two areas. The catch basin that

stands between the split pieces of Kenwood belongs to Chesapeake High School. About two miles further away from our proposed site than Kenwood High School, Chesapeake High School is home to the county's Science, Technology, Engineering, and Mathematics program. Chesapeake is reasonably populated at 100%. Like Kenwood High School, its catch basin is also split. Two other high schools play a peripheral role in this part of Baltimore County. Loch Raven High School is the school districted north of Perry Hall High School. Loch Raven High School's population is, as of 2006, at a very high 122% capacity. The second school is Eastern Technical High School. Eastern Tech is located one mile west of Kenwood and is a magnet high school, drawing students from all over the region to participate in its trade and profession courses.

Regional speculations about the site

These observations provide an armature upon which to mount speculation for the siting of a suburban high school. The major metropolitan areas listed support the siting of a high school in this region. A high school needs students to justify its existence. Students are drawn from areas of residential development, and areas of residential development grow and thrive where there is a job market of opportunity and stability for homeowners to access. Having four metropolitan areas within a commutable distance creates a fertile field for development all over the region, but particularly the closer one gets to the metropolitan hubs.

While growth and change mark a successful recipe in the urban condition of the region, the natural determinants make a high school in this region wise for the opposite reason: their staying power. Both the bay and the park are regional anchors, meaning they will exert their influence whatever changes may come. This stability provides value to its surroundings. Truly, all types of buildings look for value in their siting. A commercial endeavor, for example, looks for a value that leads to profitability. This value can be found in many types of settings. The value a school seeks is different and more difficult to find in a site. A school tries to inspire its students to pursue knowledge of the world they live in, culminating in the development of a passion for a specific area to pursue and enjoy in a career. It is difficult to cultivate passion and curiosity in a parking lot. However, the natural features of this region would create an ideal setting to inspire young adults to do great things.

The roads tell a different tale. While the natural determinants promote themselves as a source of inspiration and delight, the roads bring about a more practical argument. Schools, particularly high schools, join neighborhoods and communities together. As such, they want to be accessible to all the communities served. Per the observations above, the intersection of Ebenezer Rd. and MD40 looks to be the fulcrum for making this possible. It is here only, if one will remember, that the communities north and south of MD40 can access the main thoroughfare. This location would also be wise related to the current population density of the region while still positioning it to support growth along MD40 and other nearby areas. A site along MD40 is critical.

More than the other two thoroughfares observed in this region, MD40 bears the stigma of being a social divider. There is a rift in this area that one perceives by living in the community for a number of years. It is primarily a perception of education and, by inference, intelligence. White Marsh, as an example, is a community located north of MD40. Census data shows that in this community, 30.8% of adults have earned at least a Bachelor's degree in the course of their education and 72.7% work in professional/ management/ office "white collar" occupations. Bowley's Quarters, a community to the south of MD40, has 12.2% of adults with a Bachelor's degree and 56.1% working in "white collar" jobs. These numbers demonstrate the stereotype's being cast. There is a perception among some residents north of MD40 that looks at those residing south of MD40 as uneducated and living on the "wrong side of the tracks." Conversely, the perceived stereotype in the opposite direction is that residents north of MD40 are elitist snobs. For this reason, a school sited along MD40 must be specifically designed to unite communities not just in a token "public relations" way, but in a real person-to-person way.

Last, the location of the other area high schools supports the location of a high school in this region. First, it would remove the cumbersome split catch basins feeding Kenwood and Chesapeake High Schools. Second, it would alleviate the consistent overcrowding occurring in Perry Hall and Kenwood High Schools, and in a second hand way, Loch Raven High School. By siting in this region, the school would also find itself prudently placed to promote pedestrian

and bicycle access as its jurisdiction would stretch no more than four miles before reaching the boundaries of the next county to the north.

Local observations of the site

The local scale is the second dynamic of site investigation needed for a clinical analysis. "Local scale", within the confines of this thesis, refers in scope to the area within a one-mile radius of the intersection of MD40 and Ebenezer Road. This location for "ground zero" was selected in line with the regional analysis above. At this scale, there are five determinants that are seminal to the site selection process: *topography*, *orientation*, *access to the site*, *context*, and *zoning*.

The topography at the local scale is varied in its degree of "activity" by location (what topography isn't), but predictably so. At points northeast of "ground zero", the topography is gently sloped as one nears the Chesapeake Bay inlets, very gently sloped along MD40 itself, but very active north of MD40 with hills and valleys creating a near 40'-0" change in elevation at its most disparate points. South of "ground zero", there is, according to topographical maps, an elevation change of nearly 100'-0" between the top of a hilly wooded area and the low point of MD43 sloping down to connect with MD40 (MD43, to give a quick description is a road at grade north of MD40, crosses above MD40 by way of a man-made overpass, then slopes down to connect with MD40 by way of a long, curvaceous exit ramp. In recent years, this exit ramp has had a signaled

intersection added to accommodate an extension of MD43 to the south.) As one moves to points west of ground zero, the terrain becomes hilly both north and south of MD40 as there are no nearby water inlets.

The orientation of a building, or buildings, on its site can reasonably be affected by four factors: the *sun*, *wind*, *man-made elements*, and a category for *unique conditions* that may or may not exist for all sites (i.e. places of worship might be oriented towards a sacred city located thousands of miles away).

Regarding solar orientation, the conventional preference is for a design that limits direct admittance of east and west light and encourages glazing on the north and south faces. If desired, this convention can be observed at a number of sites along MD40 as there is no imposing shade or reflection element to dictate an adjustment. However, the use cycle of a high school is a factor in how much one should observe typical orientation convention. High schools in Baltimore County typically run about a 7:45 AM to 2:15PM school day. This means that the impact on the user of early morning eastern light must be calculated more carefully, while the impact of late afternoon light can be considered with less intensity. As its impact in this region is negligible, wind orientation is not a strong determinant at the local scale and therefore does not merit its own paragraph.

There are a few man-made elements, however, that do deserve attention. The most powerful of these is MD40 itself. At a width of four travel lanes with shoulders on each side in both directions, the highway is substantially wide. It's

speeds also run between 40 and 50 MPH making it difficult to traverse. From an architectural point of view, how one chooses to relate to the highway and practically deal with the needs of student drop offs and service/deliveries is important in determining orientation. Besides the highway, there are also high voltage power lines in the region. In selecting a specific site, care should be given to avoid these lines as prescribed by codes enforced in the jurisdiction.

Access to the site is the third player in local site selection, as transportation would likely be the number one concern related to the logistics of running a school. First, buses must be able to access the site. This requires that provision be made for accessibility from all directions, something a highway with median barrier wall makes troublesome. Also, as much as bus loops are anathema as currently designed, they do require a dimension in line with the maneuverability of long buses (the manner of bus size, etc. is not a topic of this thesis, though some might consider it an issue). This needs to be worked in to the accessibility plan. Second, accessibility must be made for staff, student drivers, and those who are dropping off their kids. Parking lots fall into this category. As an observation, parking lots are one of the true nightmares of high school design. Anecdotally, some schools have students just drive over the lawn of their school to get out of the parking lot at the end of the day because lines of cars and exits points are miserable. Third, accessibility for pedestrians and bike riders must be considered. Of primary importance is the safety of these routes, but also, with the push towards eco-friendly design, the visibility and siting of these routes is

important to consider early on so as to promote the most use possible, given the other site conditions.

Context and zoning, the final two site selection criteria, are interwoven with one another. With regard to context, there is very little, quantitatively and qualitatively, in the way of built forms. The general mass of building is low and sprawling. From the immediate context, a prevailing building material cannot be determined either, though a more regional look shows brick to be most popular. The current zoning along MD40 is a mix between business and light industrial with residential zones north of Red Lion Rd. In line with this, the uses along MD40 include a boat dealership, a patio furniture warehouse, and some non-descript industrial facilities. In some of these industrial buildings, occupancy is difficult to determine. Additionally, there is solid evidence of the highway's current relationship with the trucking/shipping industry. Cheap hotels, motels, and gas stations are found regularly.

Local speculation about the site

In the case of a school typology, speculation about the site at the local level should respond to the general issues above, but also to issues that are more idiosyncratic, such as playing field design and campus gathering spaces. In response to the topographic data listed above, the design of this high school should absolutely search for the most appropriately disposed piece of real estate to

a sectional design approach. In brief, find a slope that naturally allows for a "bridge" level of adequate height to cross MD40. The overall activity in the topography does not appear to have any red flags, such as low points where unwanted drainage would accumulate, so that is not a concern.

Orientation should be considered in this order: [1] relation to the road [2] relation to nature [3] relation to sun. In order to fully take advantage of the sun, one would need to locate a linear building along the highway, an approach that does not work well with the goal of creating connections across the highway. As this arrangement is undesirable for the overall intent of the study, solar orientation should be placed accordingly. Relation to the road should be considered more important than relation to site in that it is truly the definitive element of the site. The nature is currently hidden.

[Addendum: After the comments of the final review, this point could or should probably be reexamined. By responding to the road predominantly, the impression was given of a building that could be picked up and moved to any road on any site. Perhaps giving site orientation more weight would have been correct]

Access should be approached one of two ways, both of which have potential flaws. First, one could make the predominant access point to the building site a side road. By locating bus drop offs, etc. along a side road, you get the students away from the higher speeds of MD40 and in theory create a safer environment. However, this will add likely such an influx of traffic (particularly

in the afternoon) that, unless the road is new, it will likely be unable to handle. The second option is to locate the main access point off of MD40 directly. This would make sense from a volume standpoint as the highway is sized for a lot cars/buses. It would also make sense as wayfinding would be easy for most travelers. The MD40 access point would have the disadvantage however that you can only access it traveling in one direction on the highway. In order to access it from both directions, a turn lane would need to be introduced that would be a menace to current traffic patterns.

As intimated above, the zoning and context need some changing. Zoning in particular should be updated to allow for residential uses of higher density near the highway. Also, to invigorate the highway in the present day, business and light industry uses should be subjugated to commercial and institutional uses. Industry in this area is simply not able to support the highway as it once was.

Playing fields are a difficult puzzle to approach for this thesis as one of the goals in siting is to create a school that engages its site. Also, planning a campus that does not require the traditionally huge parcel of land which is becoming extinct in the suburbs is fundamental. Playing fields, however, have a set dimension. One cannot easily reduce the overall size of space needed for playing fields unless one is able to stack or share fields. As this is a single school endeavor, sharing fields is tough to justify. Also, stacking is difficult based on the shear numbers involved. For example, if one were to build a regulation soccer field on top of a building, the footprint of that building would need to be

approximately 80,000 square feet. Such a compromise puts the overall goals of limiting the building footprint into dire straits.

While shrinking fields is difficult, engaging the fields is more reasonable. One desirable technique would be to wrap a prominent field (aka football) with building program to create a stadium-type atmosphere. The opposite would also be an alternative. One could buffer a school from parking and road activity by creating a greenbelt of field surrounding it.

The concept of campus gathering places is also a unique site consideration as there are a number of gathering place types and uses. First, provision should be made for functional gathering places including covered waiting areas for students stuck in inclement weather and outdoor auditorium spaces for organized assemblies/rallies. Attention should also be paid to informal, more intimate, spaces for small groups of students to gather and socialize.

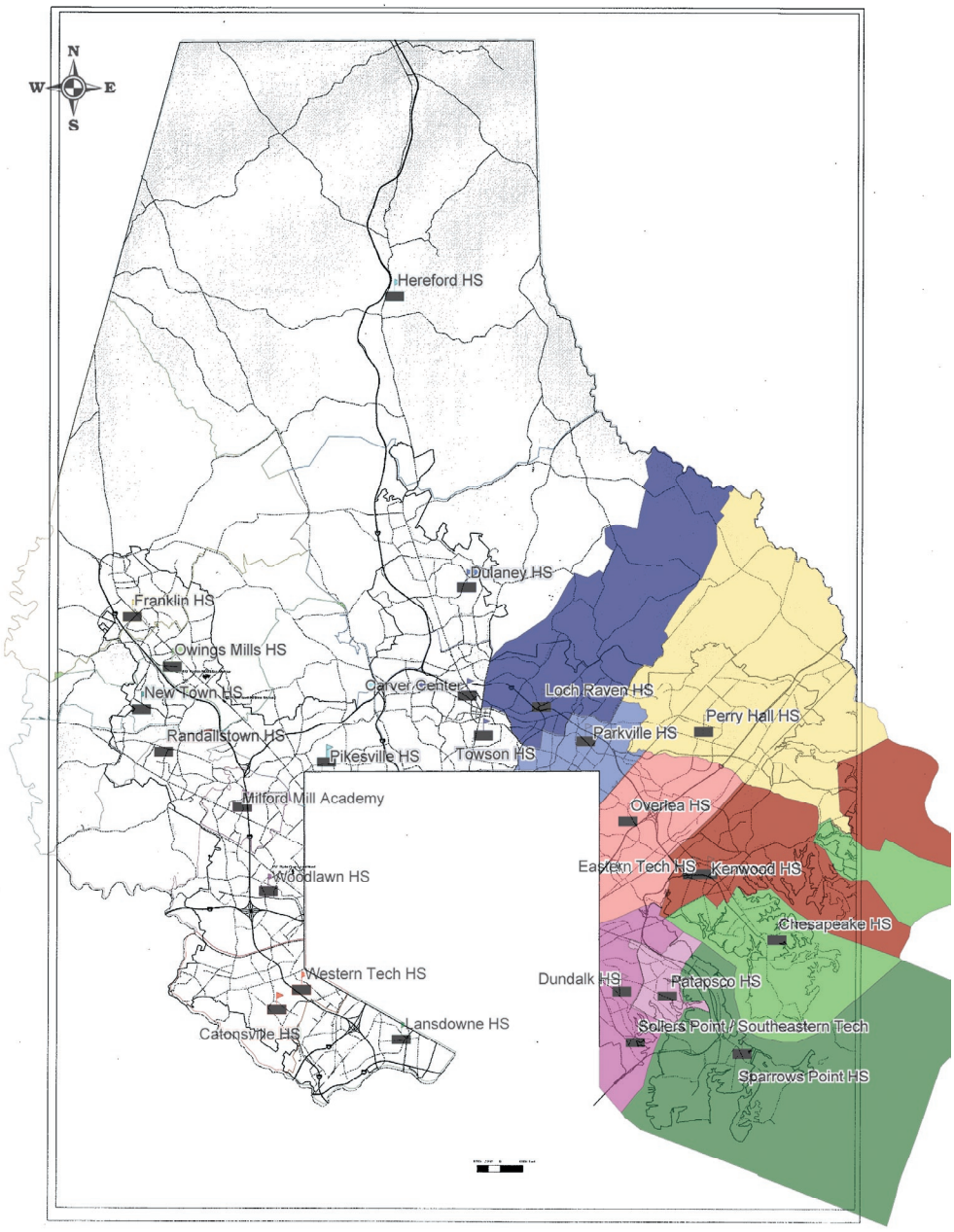


Fig. 4-04: Baltimore County, MD. Note locations of Baltimore County High Schools in area of thesis exploration and their student catch basins (jurisdictions)

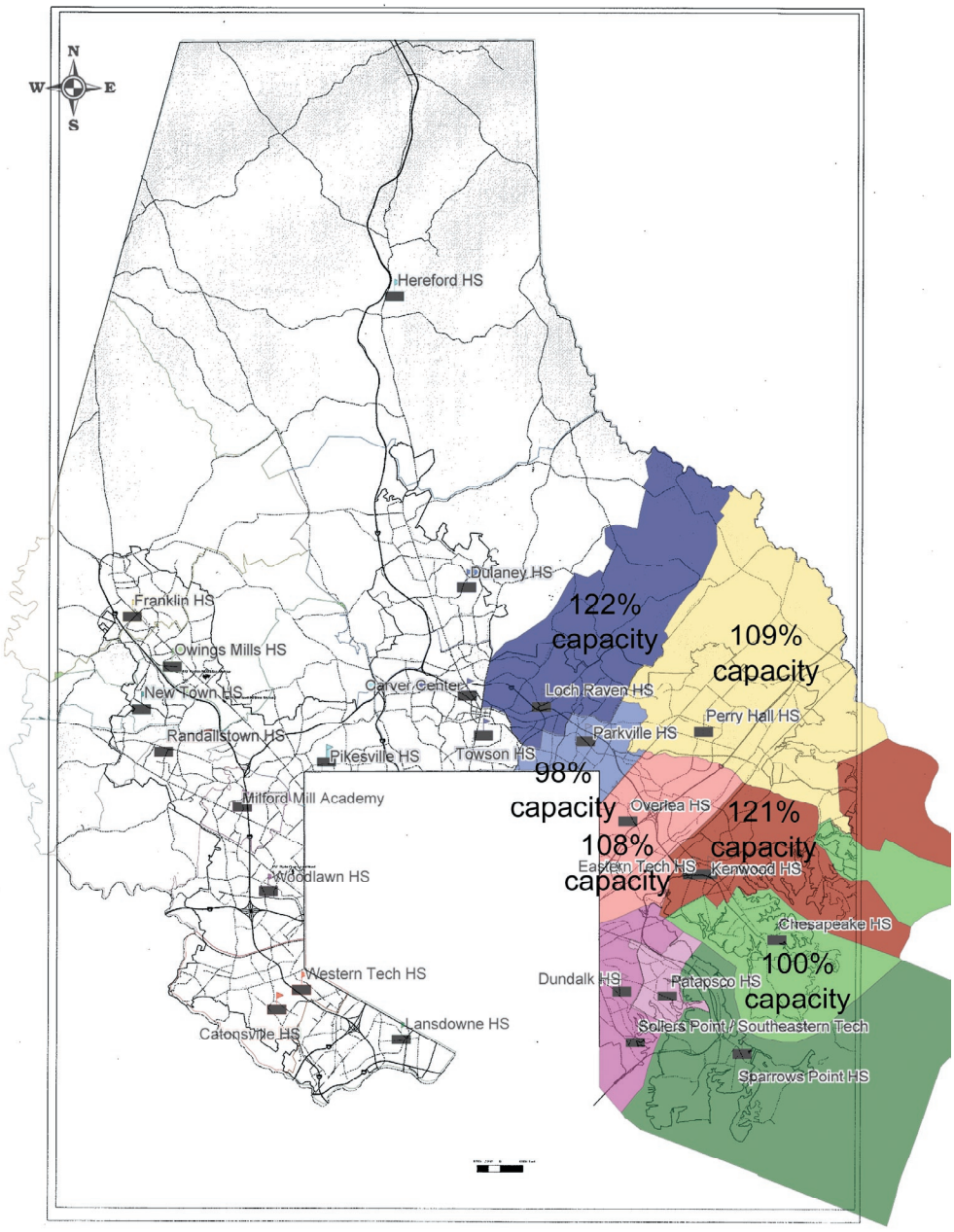


Fig. 4-05: Baltimore County, MD. Note percentages of student populations in 2006 compared to the school's state rated capacity (100%)

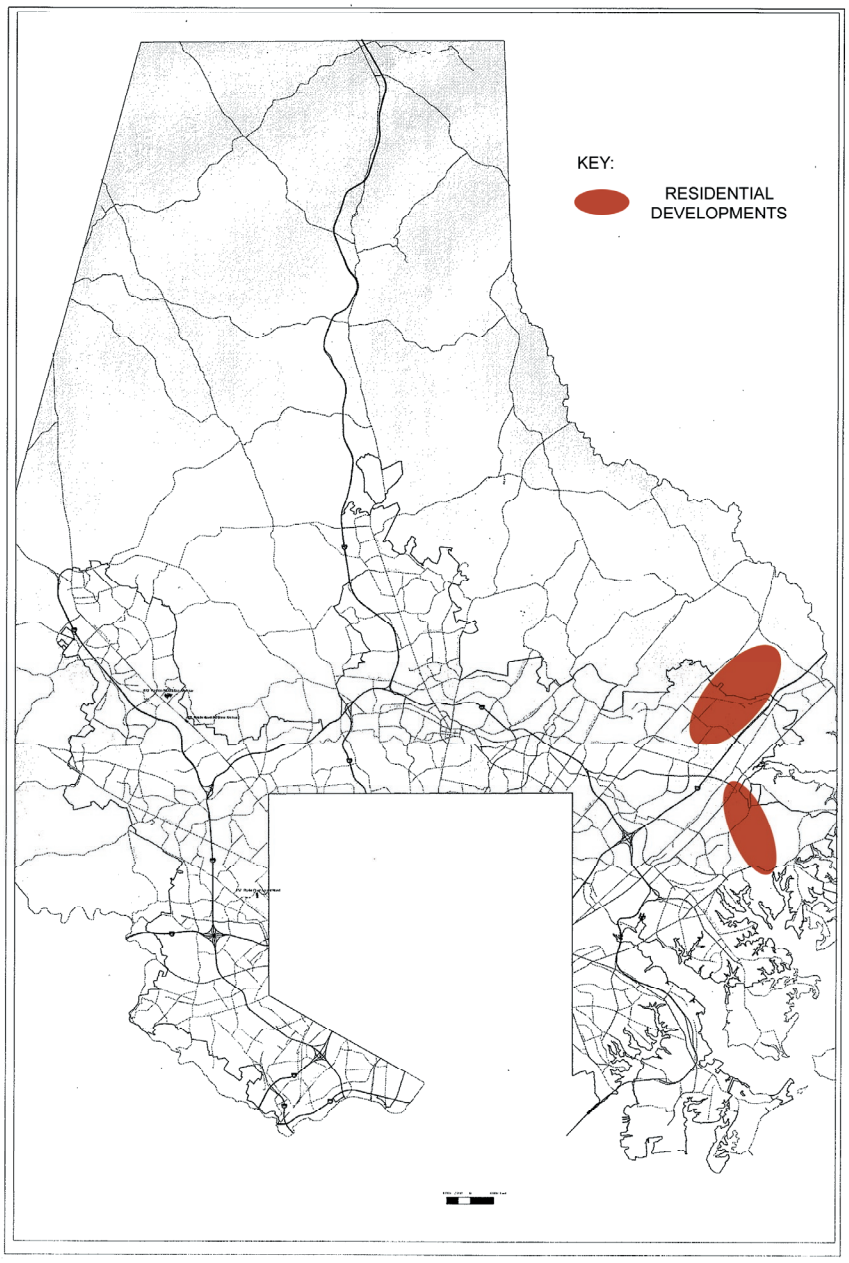


Fig. 4-06: Baltimore County, MD. Note areas of current residential development. Consider the effect these areas will have on existing high schools and the potential location of a new high school.

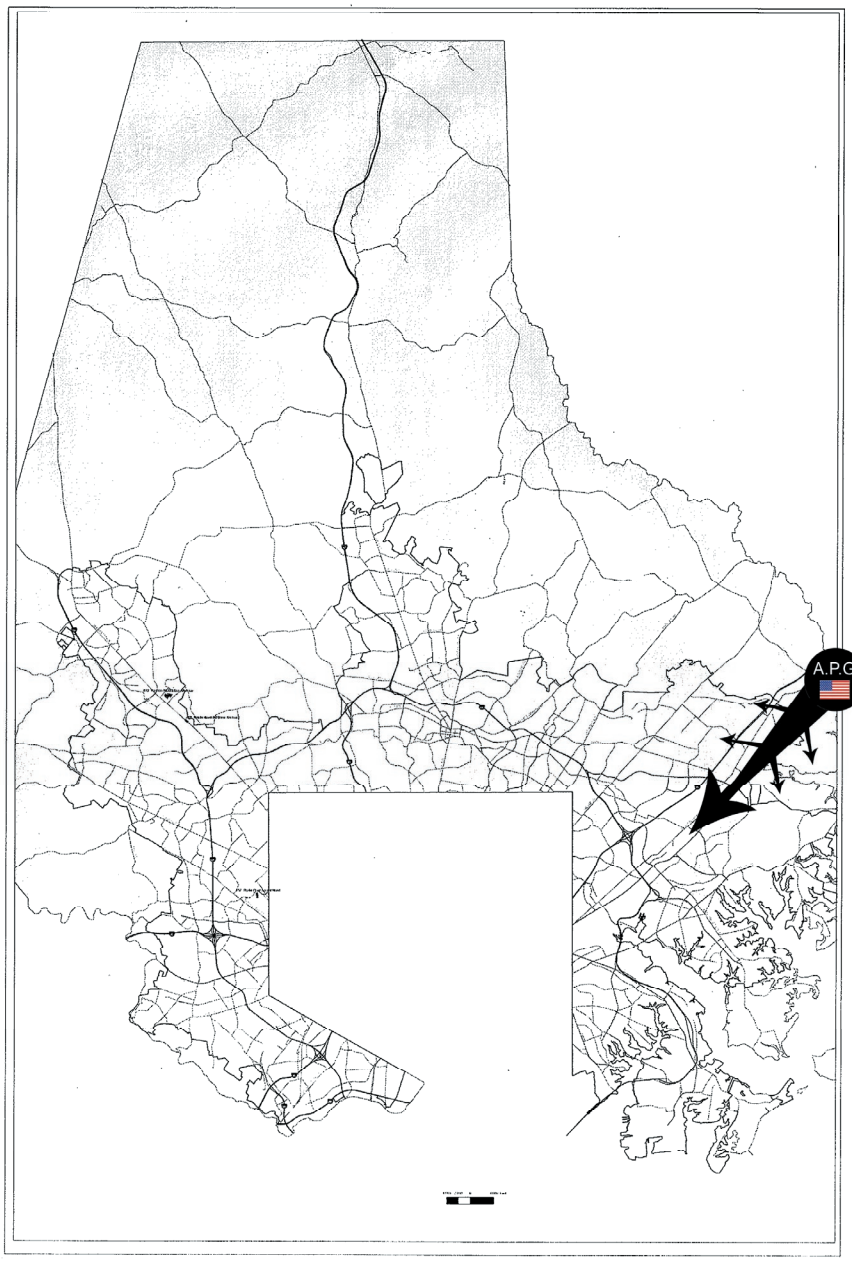


Fig. 4-07: Baltimore County, MD. The BRAC related changes at Aberdeen Proving Ground to the north will push MAJOR development along MD40, the prime route accessing the research facility.

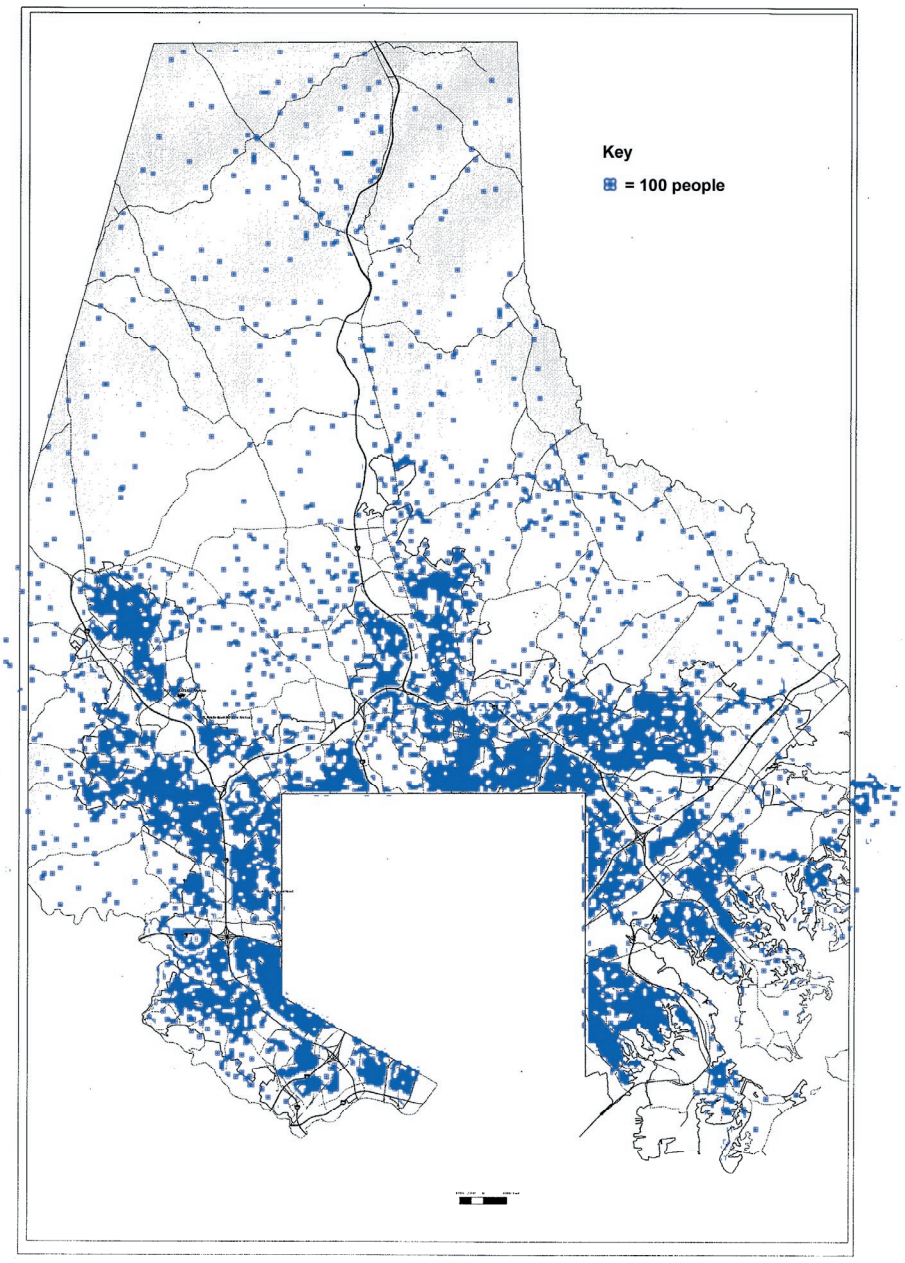


Fig. 4-08: Baltimore County, MD. The pattern of population density in Baltimore County shows development follows major arteries. The combination of 1-95 and MD40 is a likely site along which this trend will continue.

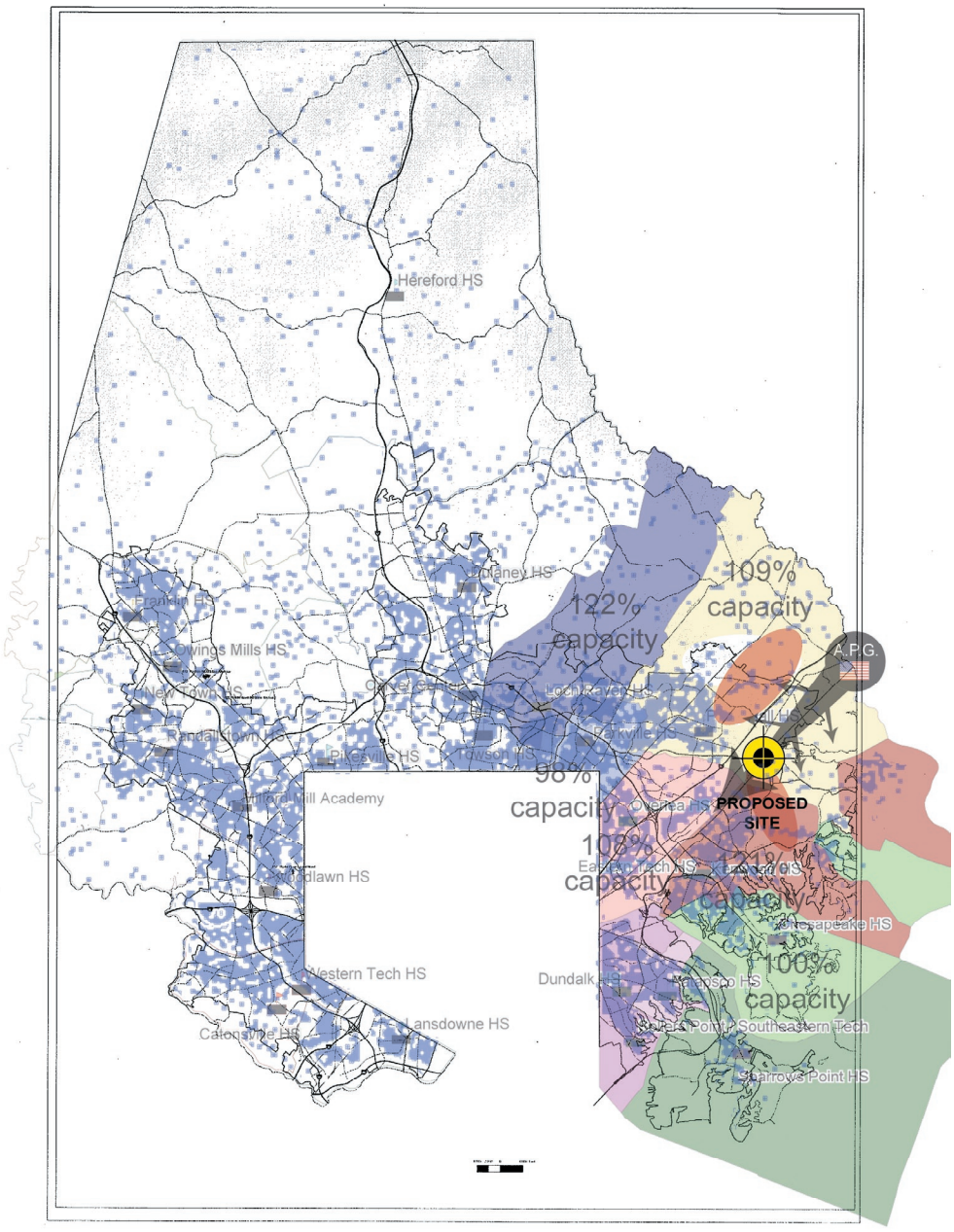


Fig. 4-09: Baltimore County, MD. The factors being considered, this location was identified as an appropriate site to meet the needs of the community through a new high school.

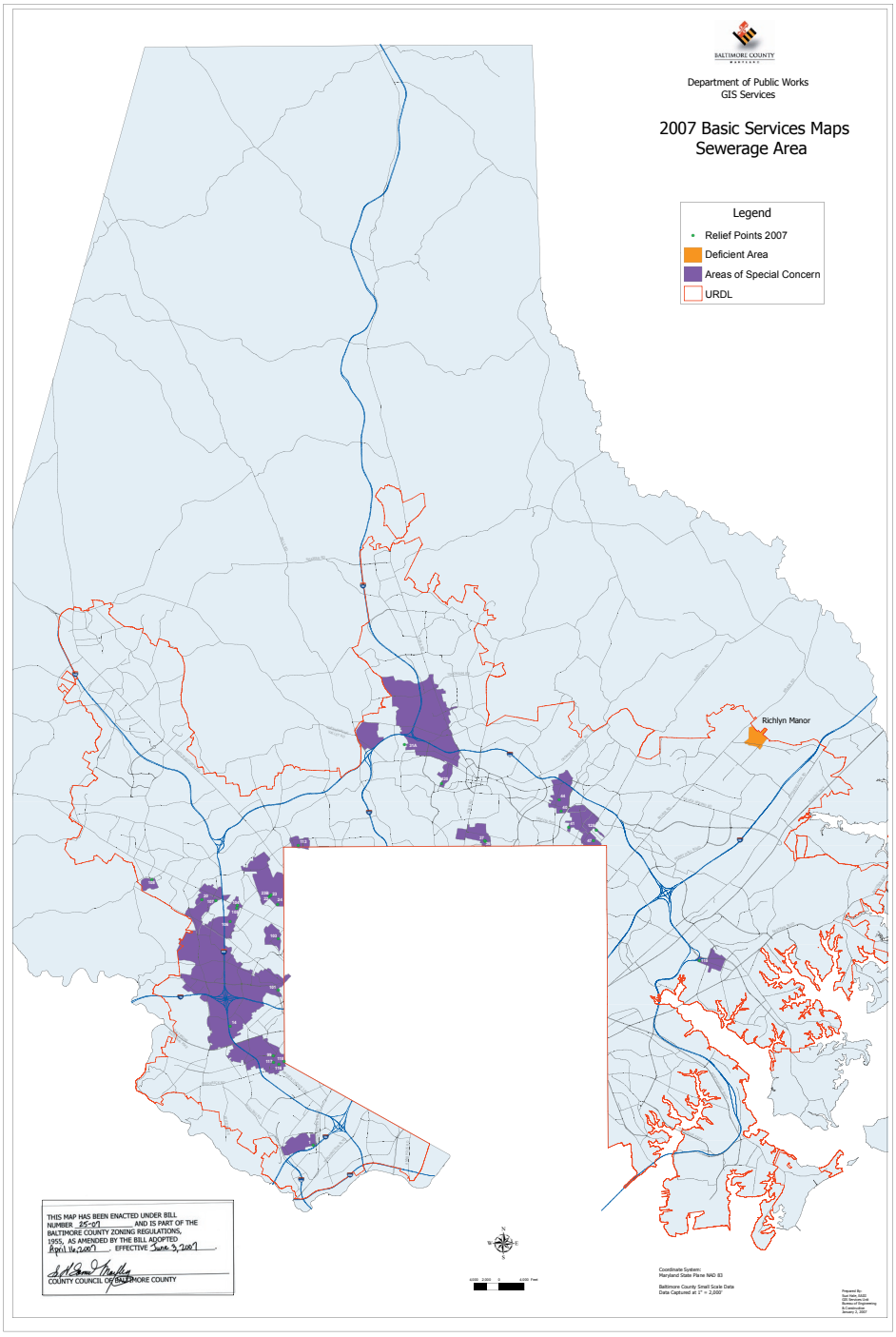


Fig. 4-10: Baltimore County, MD. A survey of the adequacy of sewer facilities in the county. Sewer service will not be a determinant of site selection on the authority of this map.

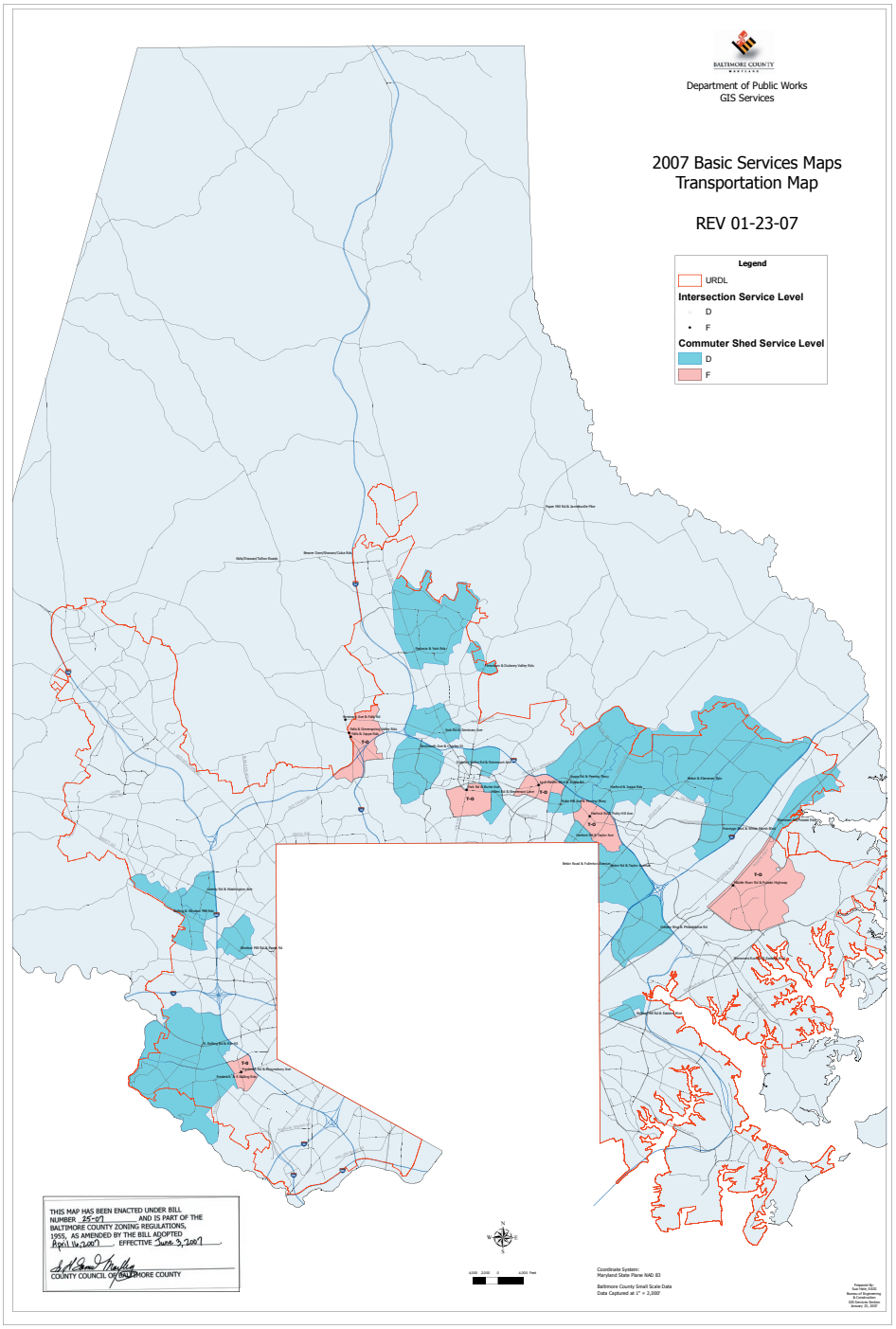


Fig. 4-11: Baltimore County, MD. A survey of transportation sheds in the county. Much of the area served by a new high school would be in aaeas of medium to high commuter traffic.

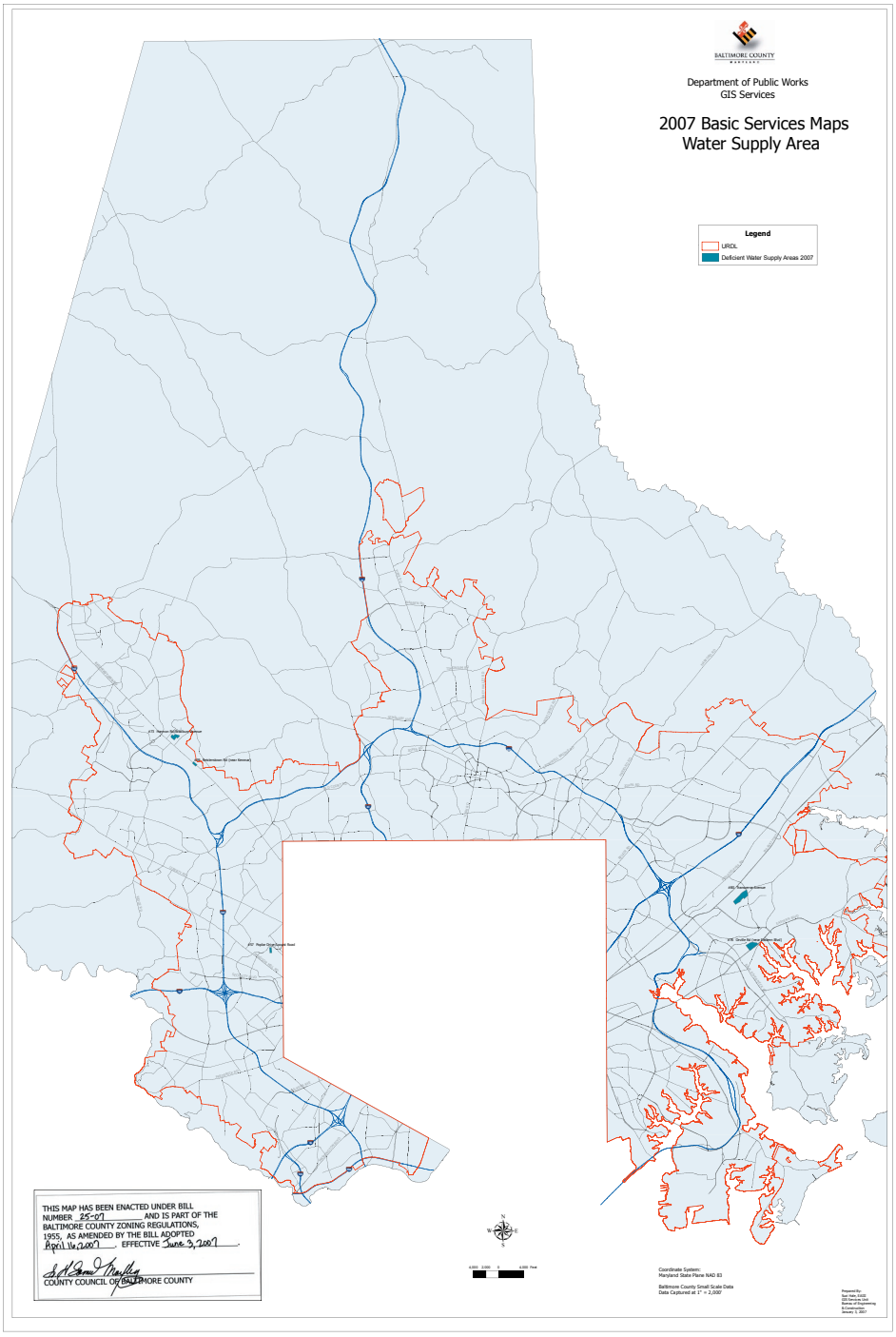


Fig. 4-12: Baltimore County, MD. A survey of the adequacy of water supply in the county. Water supply will not be a determinant of site selection on the authority of this map.

Fig. 4-13: Baltimore County, MD. This map notes the locations of the counties middle schools. This is a good reference for the county's practice in siting and overall planning of space around this thesis's new high school.

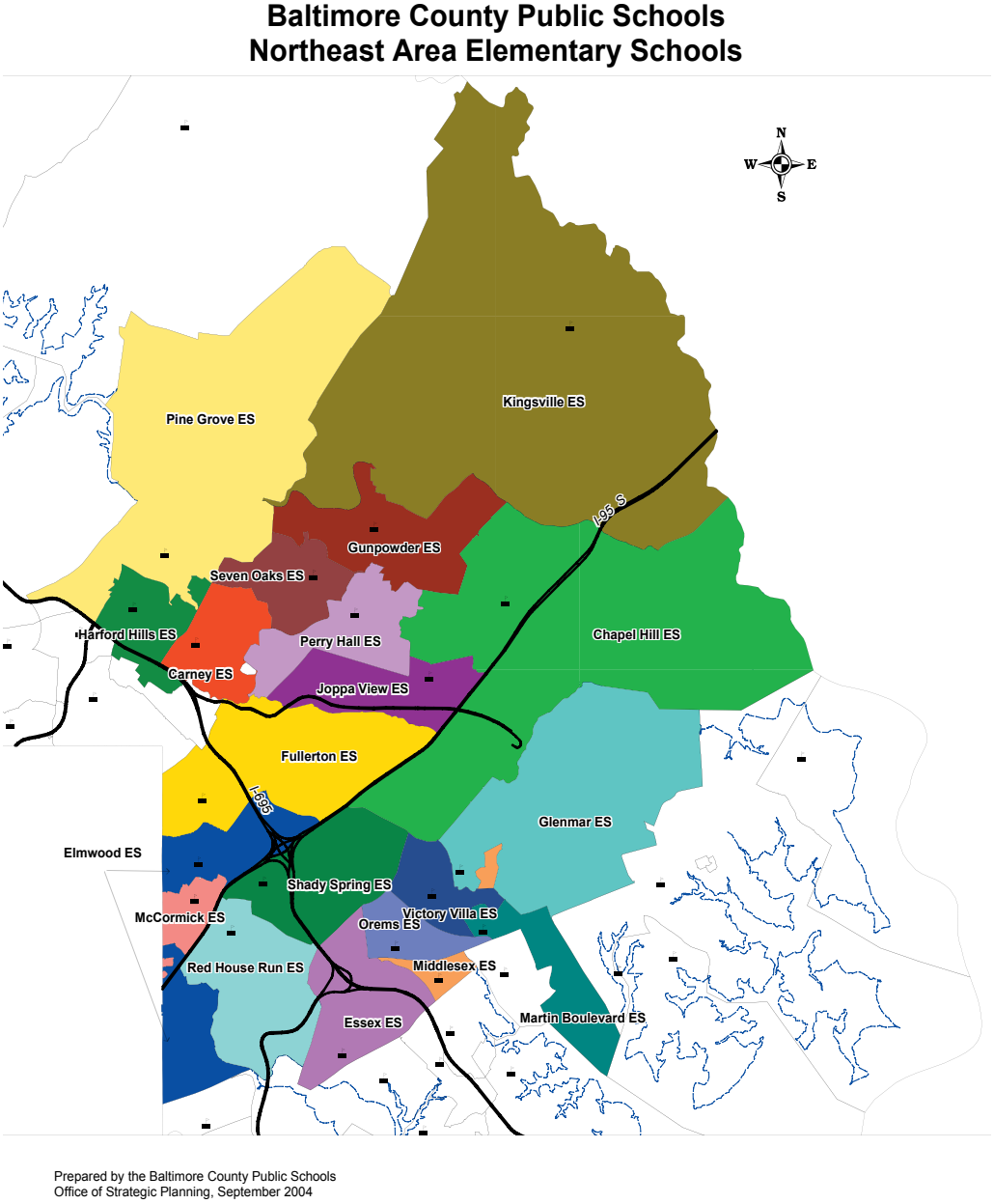


Fig. 4-14: Baltimore County, MD. This map notes the locations of the county's northeast sector elementary schools. This is a good reference for the county's practice in siting and overall planning of space around this thesis's new high school.

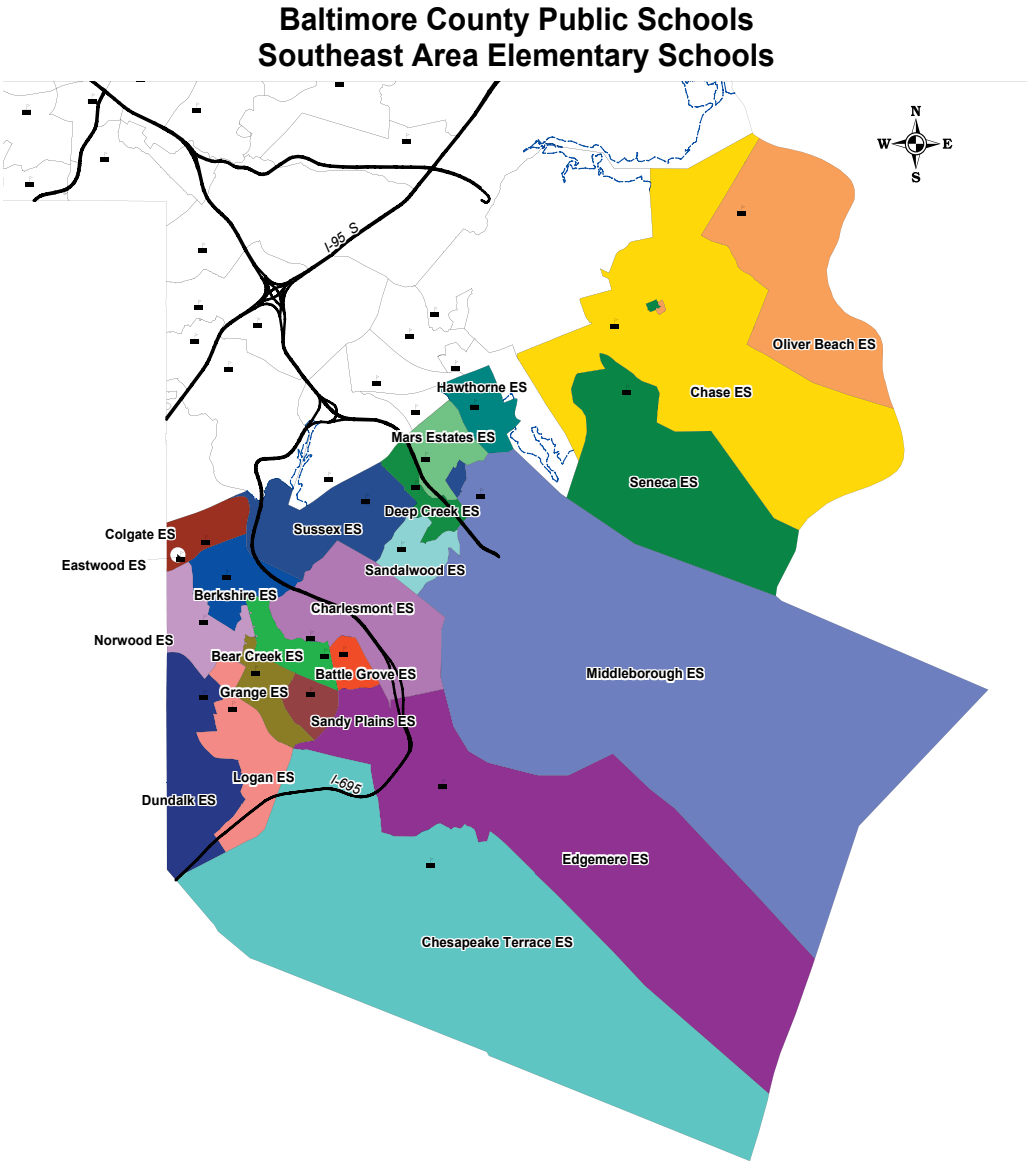


Fig. 4-15: Baltimore County, MD. This map notes the locations of the county's southeast sector elementary schools. This is a good reference for the county's practice in siting and overall planning of space around this thesis's new high school.

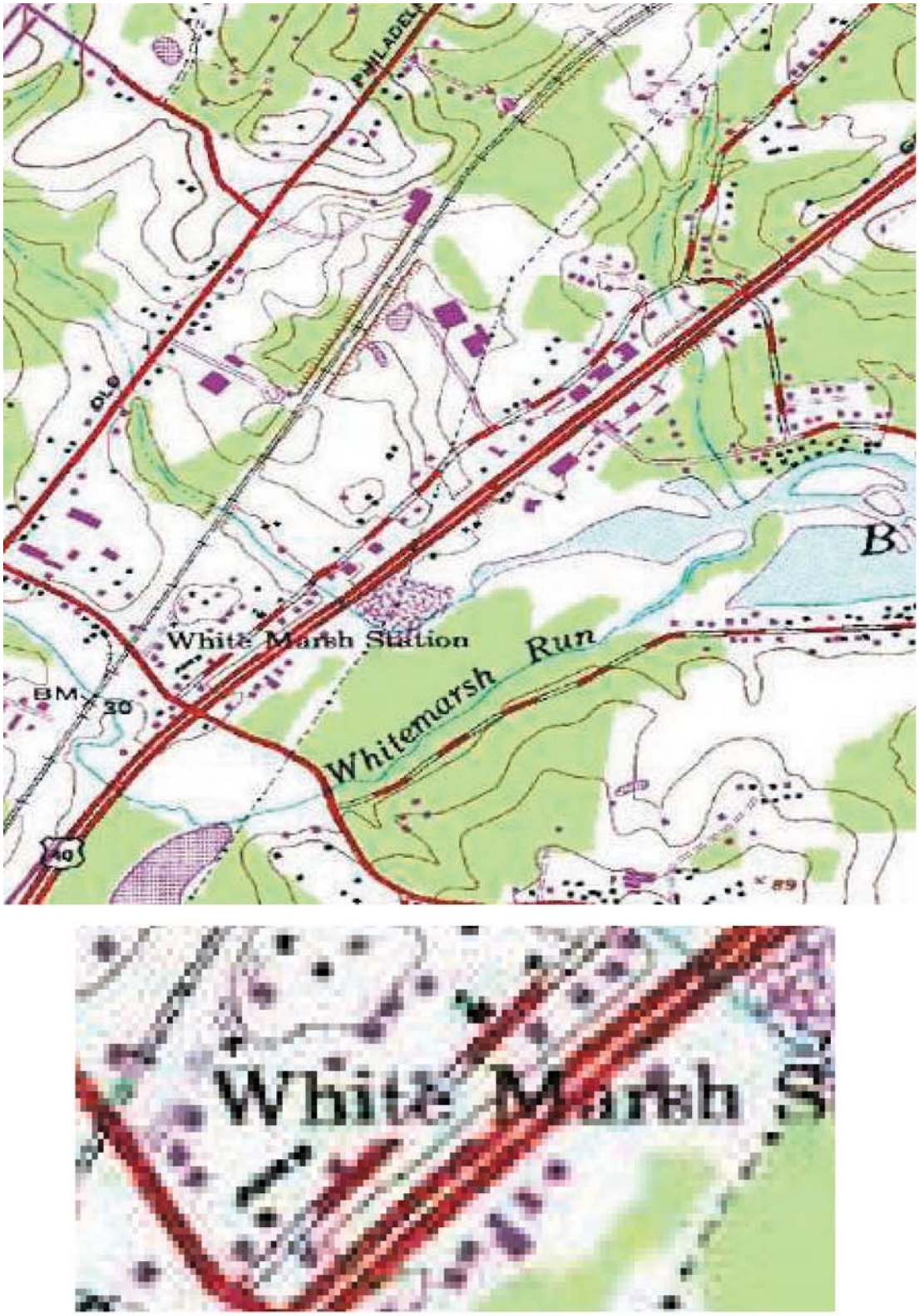


Fig. 4-16: Contour Map, Baltimore County, MD and Enlarged. The topography is a bit rolling with hills and valleys. Note that there is a line parallel to MD40 at bottom that notes a 10'-20' change in topography.

Chapter 5: Precedent Images and Annotations

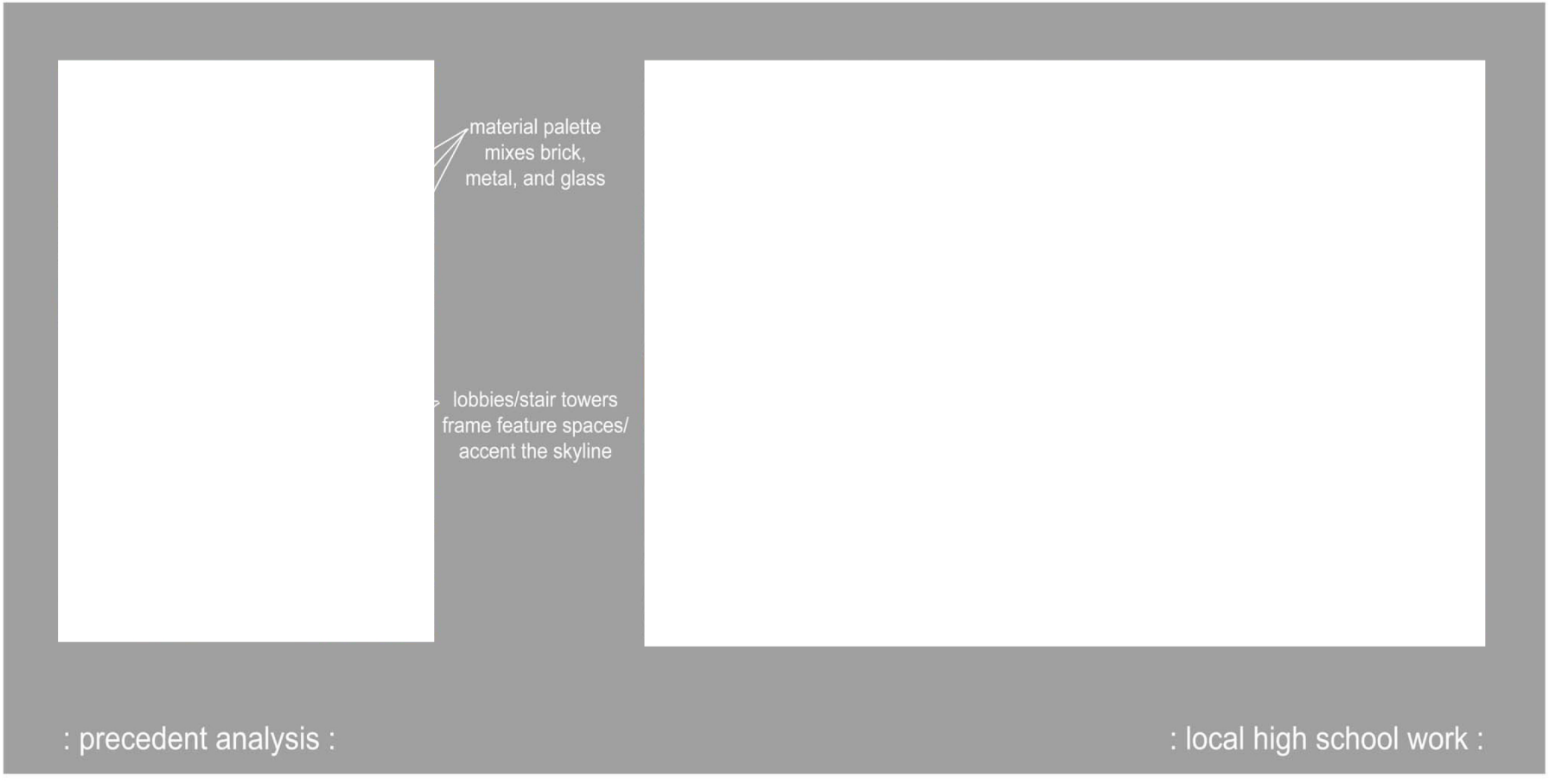


Fig. 5-01: Precedent analysis board - local high schools

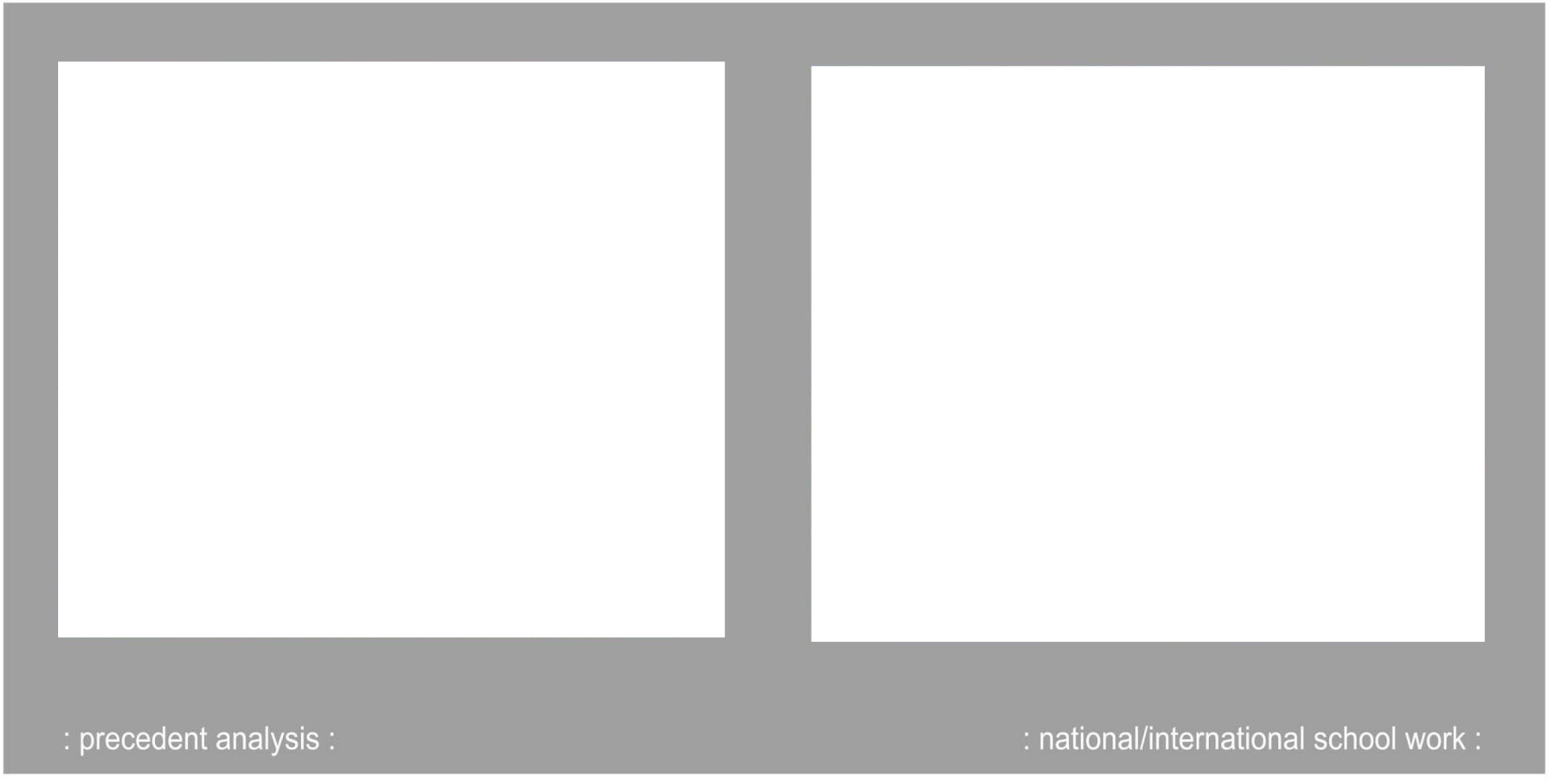


Fig. 5-02: Precedent analysis board - schools abroad

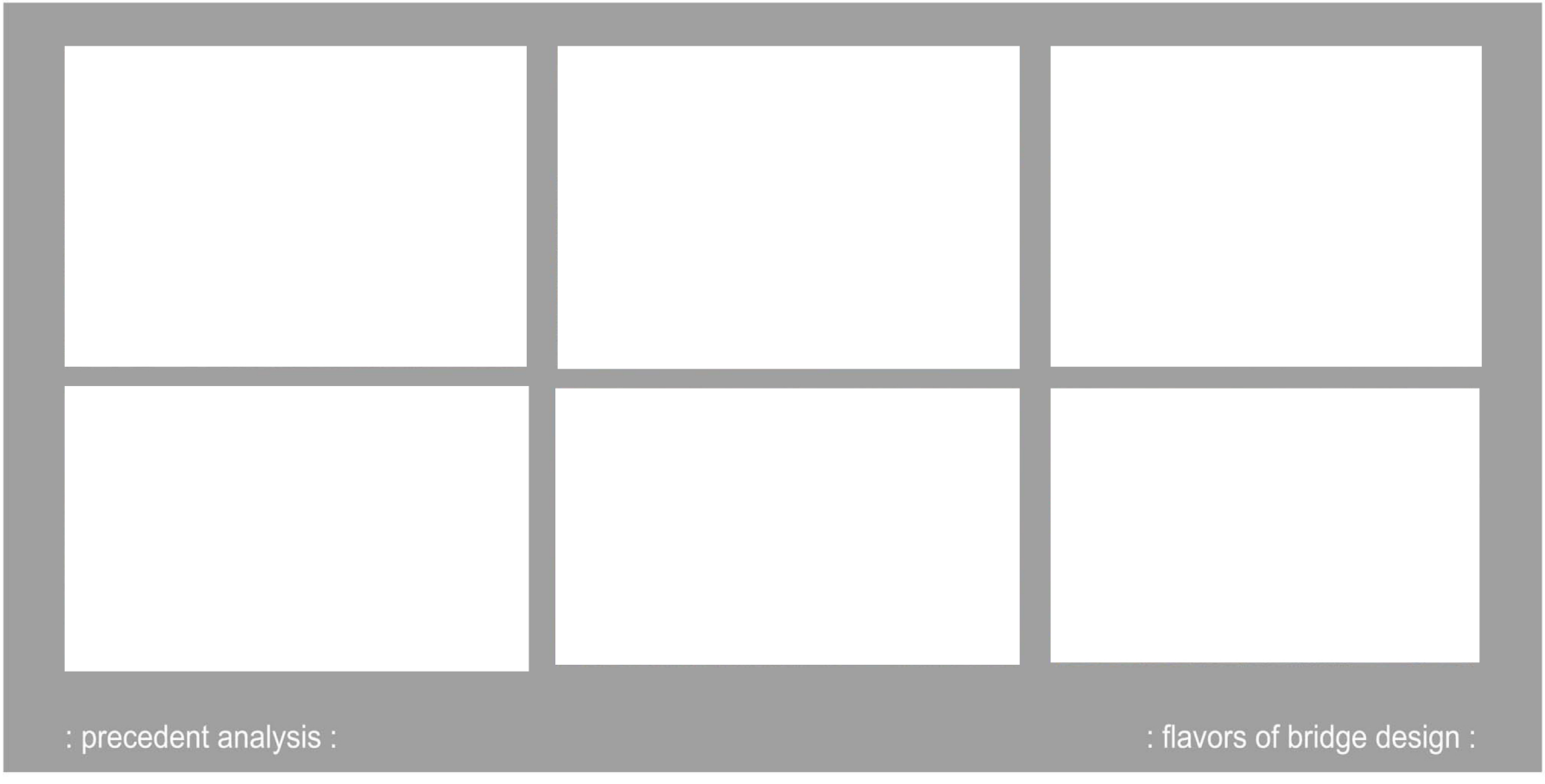


Fig. 5-03: Precedent analysis board - bridge typologies

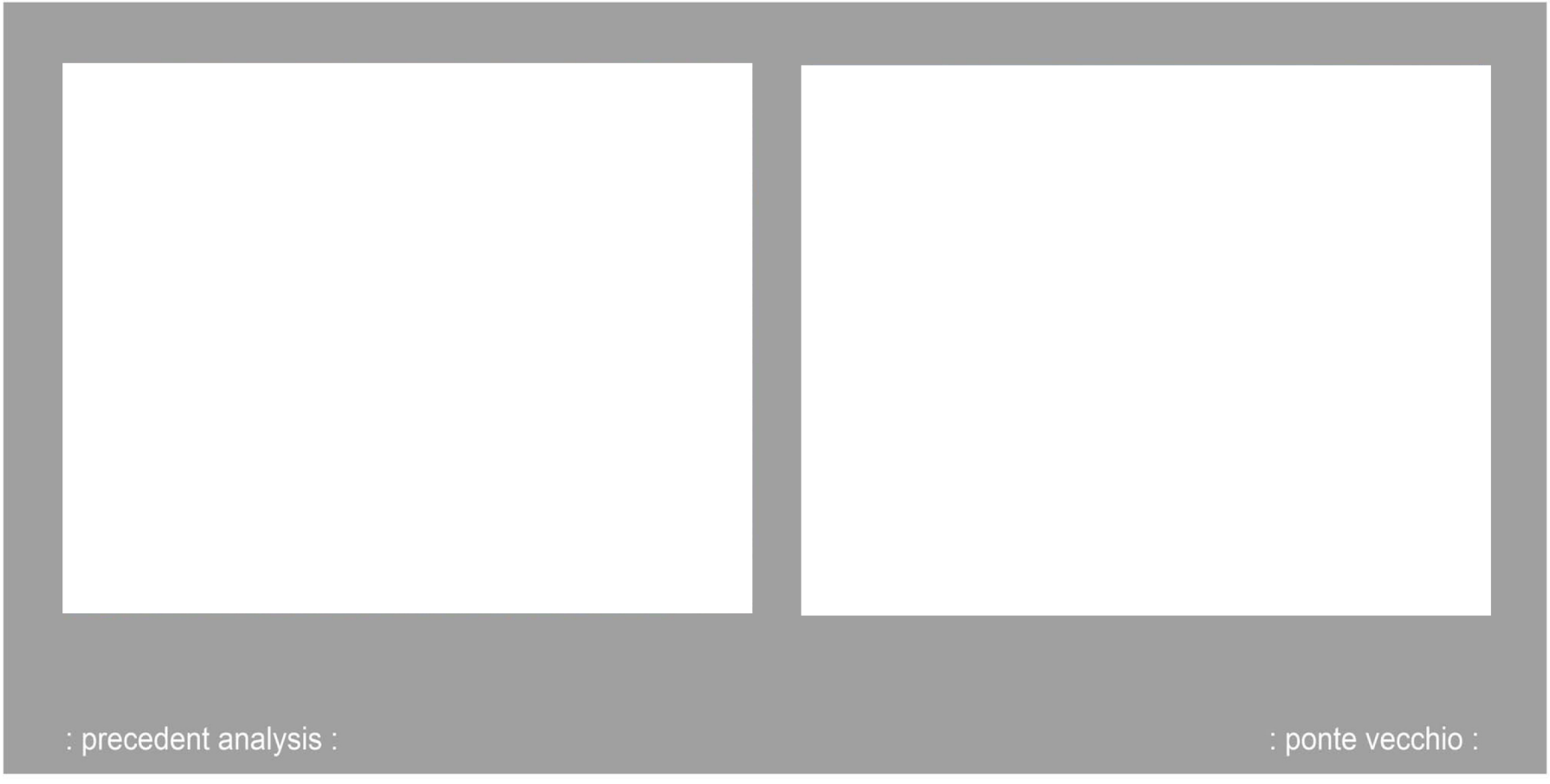


Fig. 5-04: Precedent analysis board - Ponte Vecchio

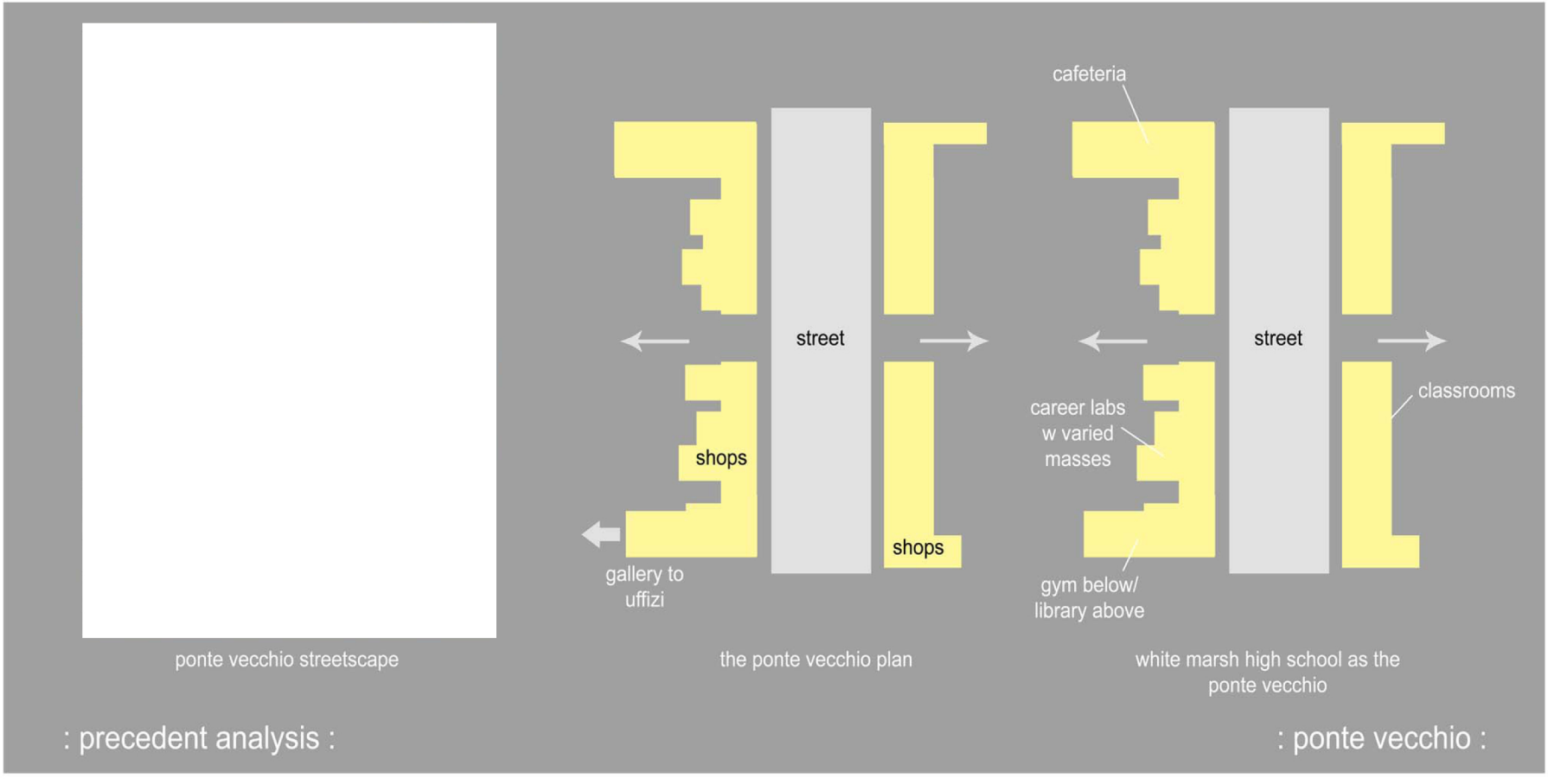


Fig. 5-05: Precedent analysis board - Ponte Vecchio diagrams

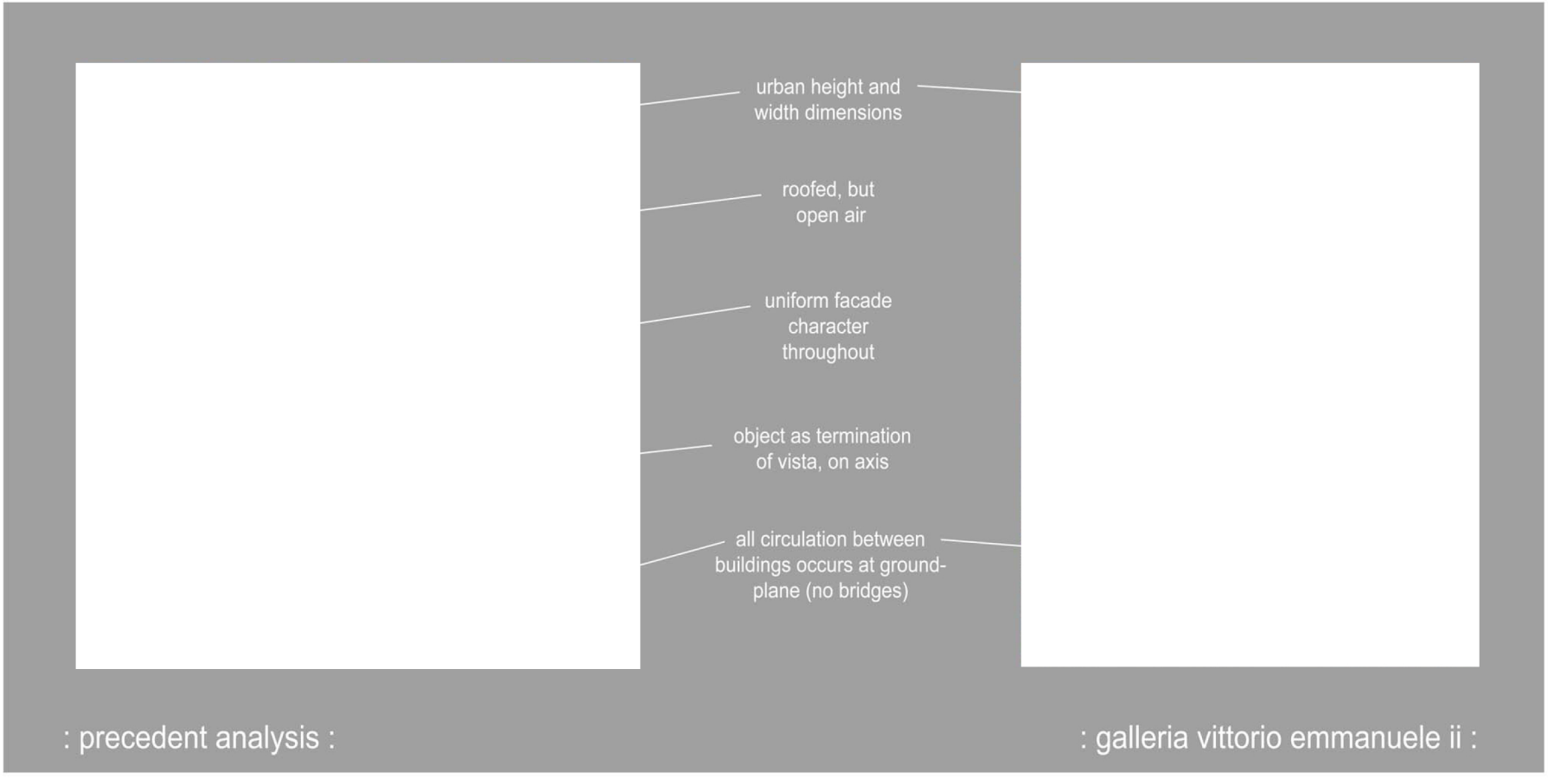


Fig. 5-06: Precedent analysis board - Galleria Vittorio Emmanuele II

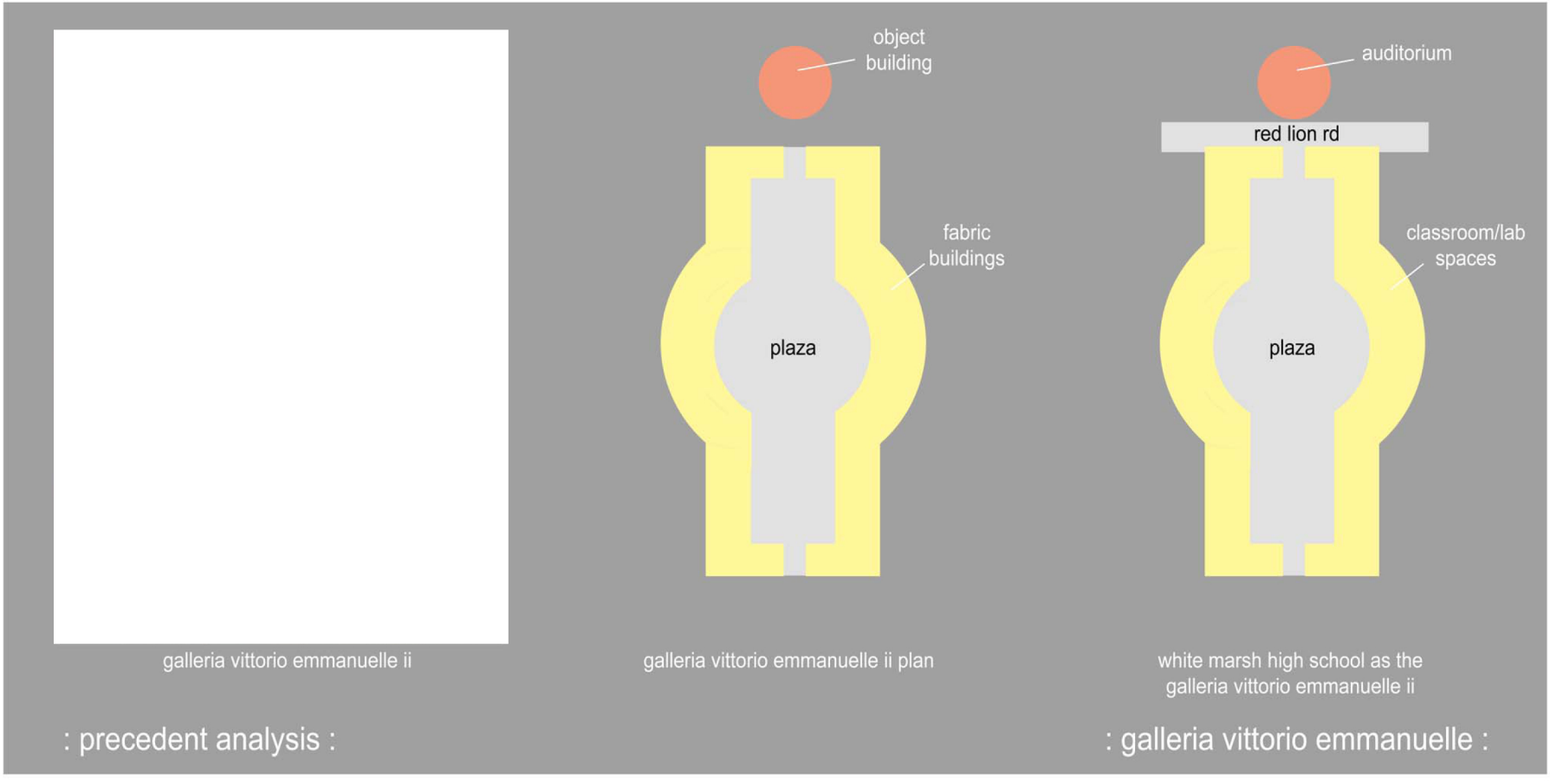


Fig. 5-07: Precedent analysis board - Galleria Vittorio Emmanuele II diagrams

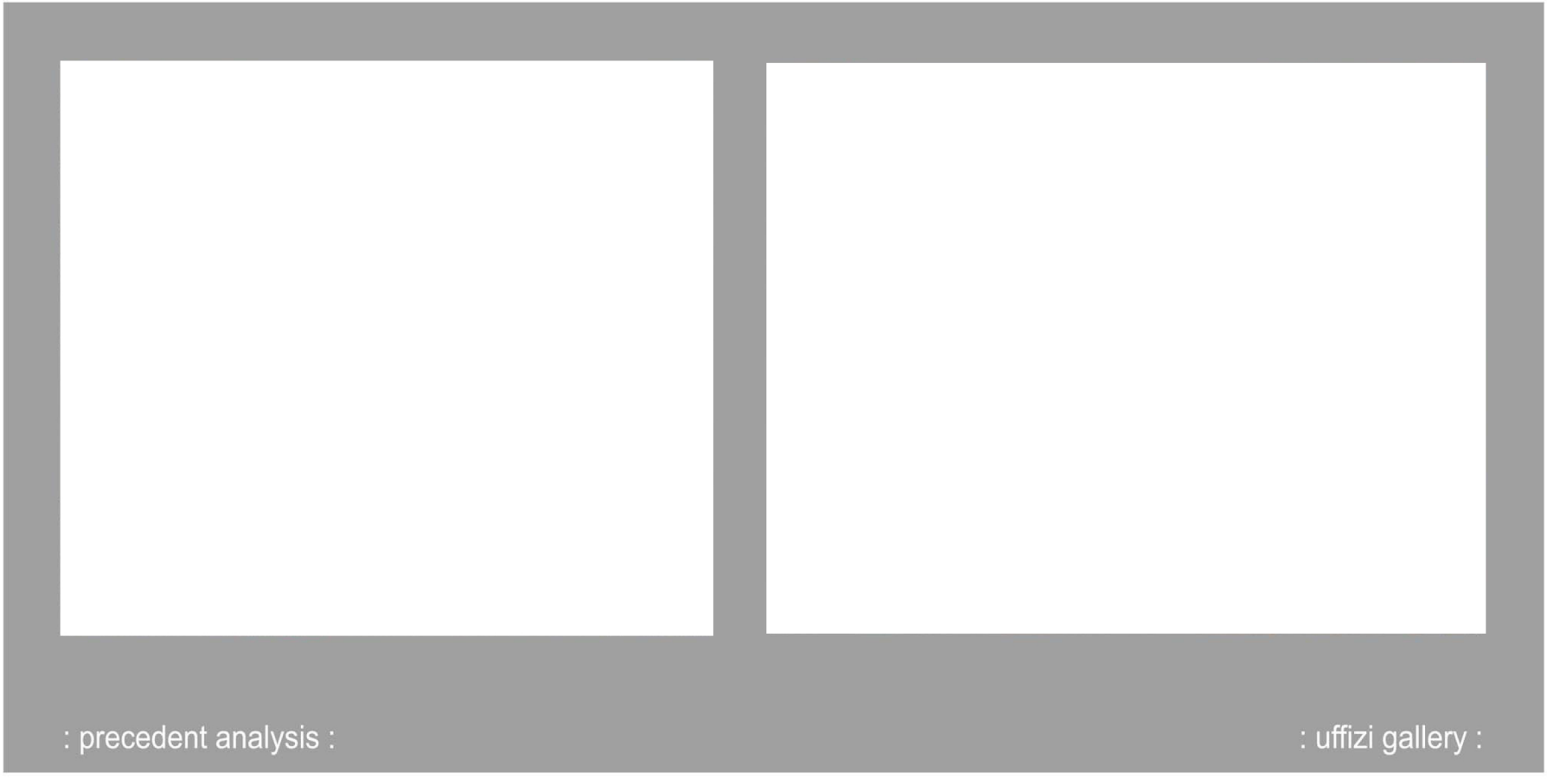


Fig. 5-08: Precedent analysis board - Uffizi

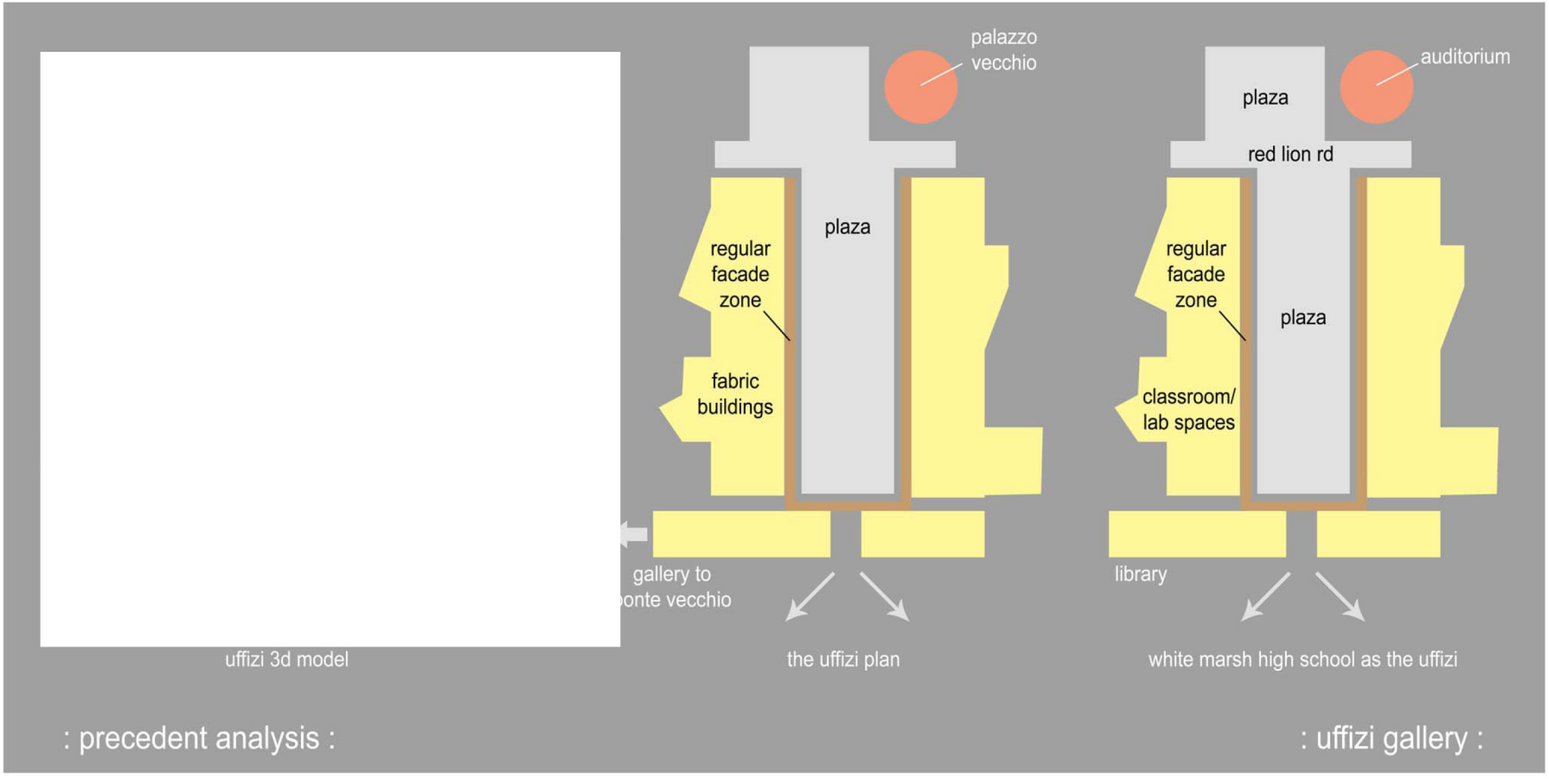


Fig. 5-09: Precedent analysis board - Uffizi diagrams

Fig. 5-10: Precedent analysis board - Illinois Tollway Oases

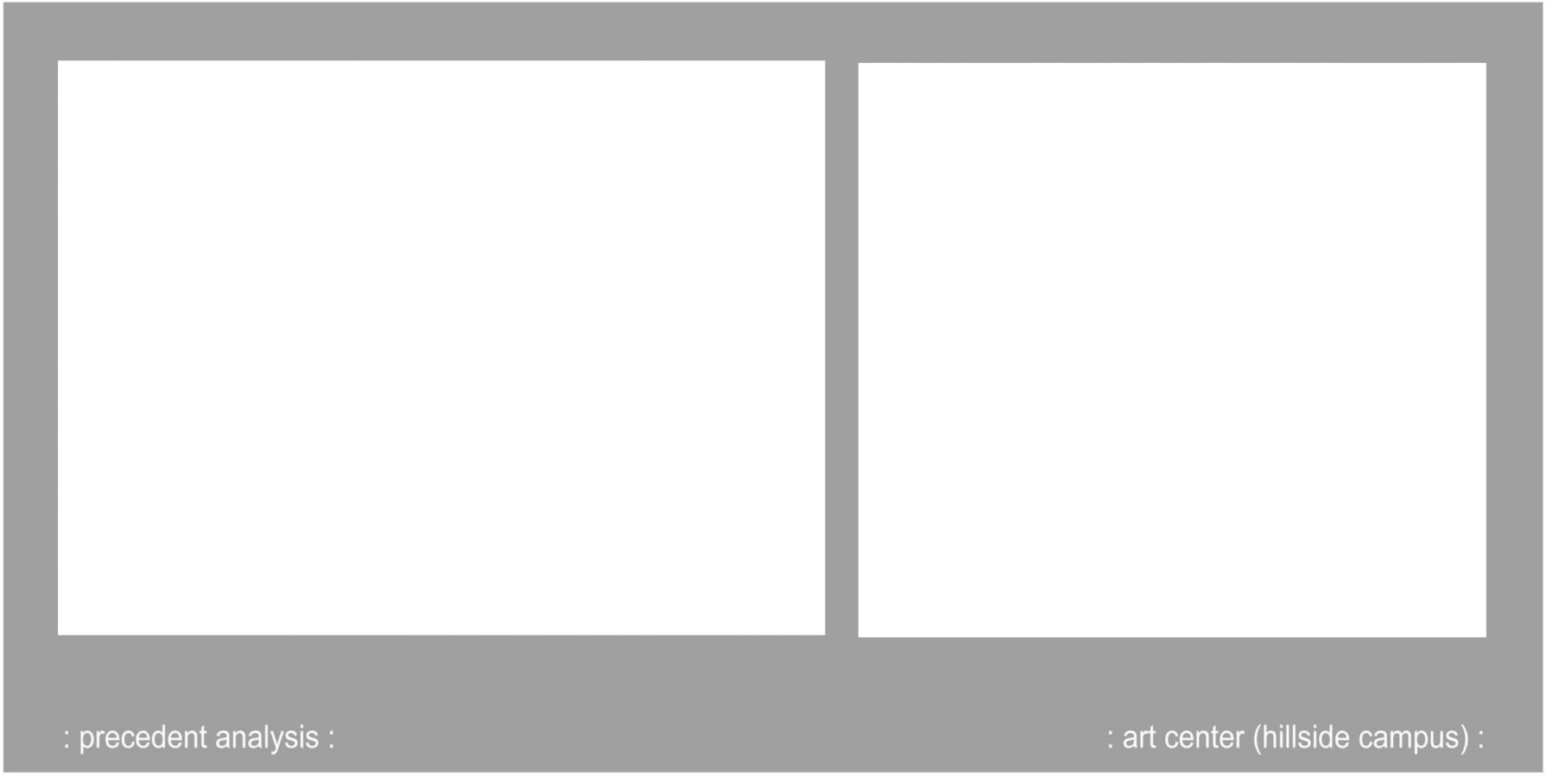


Fig. 5-11: Precedent analysis board - Art Center

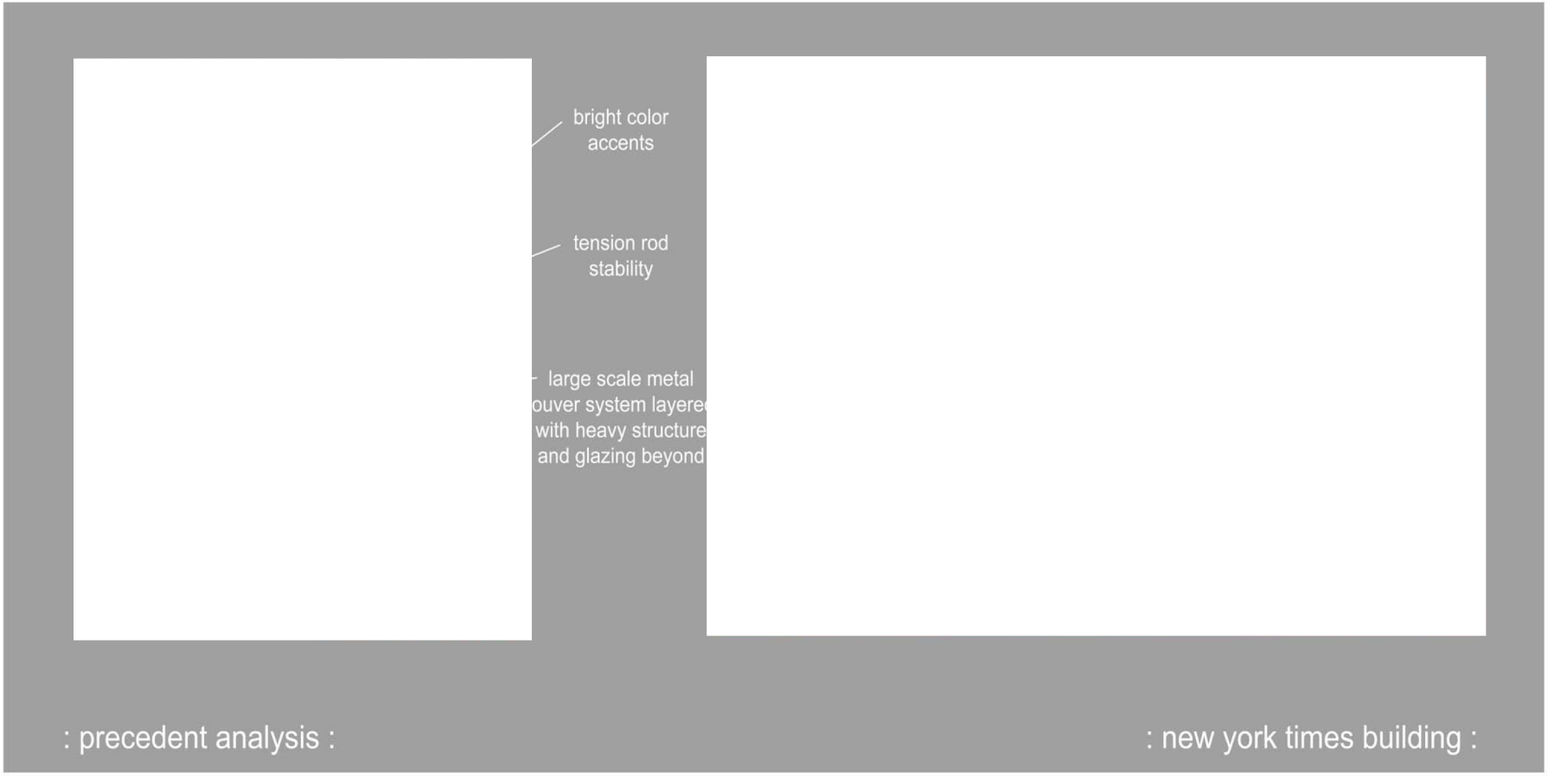


Fig. 5-12: Precedent analysis board - New York Times Building

Chapter 6: Design Schemes

Preface

The three partis elaborated in the following paragraphs show potential as organizing principles for solving this case study for the design of a comprehensive high school as appropriate for the northeast region of Baltimore County. In different measures, each responds to the deficiencies of conventional practice and typological demands expressed in chapter one, the programmatic philosophy founded in chapter two, and the site observations and speculations of chapter three. At this juncture, the options are being considered clinically with conclusions of merit to follow.

Parti A: Bridge

A parti by which a literal bridge spanning the highway is created has much in the way of appeal. Practically, its value is three-fold. First, by designing the school complex as a bridge across the highway, pedestrians and bicyclists (and perhaps even vehicles) will be provided with a safe means of navigating their way across an otherwise daunting high-speed street. This promotes multi-modal transportation, a good practice for sustainable living and growth. Second, the portion of the building built within the air space above the highway will, obviously, not be resting on the ground. This reduces the building's impact on the site and makes use of space that traditionally has been unusable. Third, no matter how one slices it, the most efficient diagram for much of a school's program is

linear. This being the case, a bridge parti, which is also linear in nature, promotes efficient organization and use of space. The less tangible advantages are compelling as well. Better than any other parti, a literal bridge parti would create a connection between the disparate communities on the north and south sides of MD40.

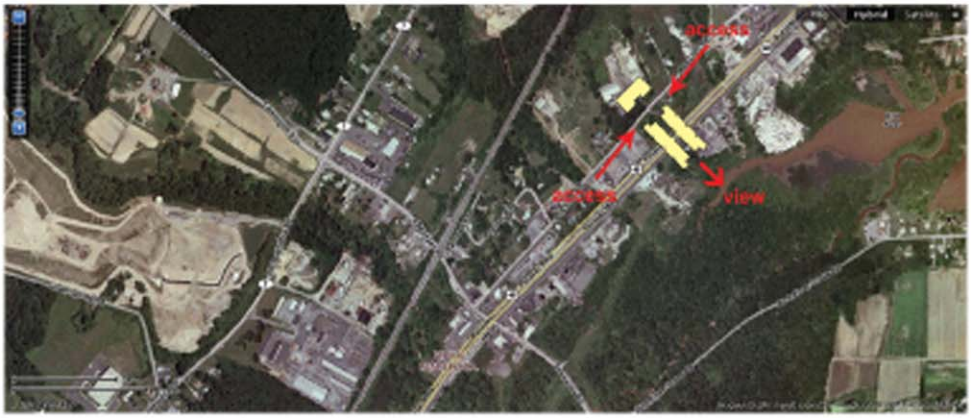


Fig. 6-01: Aerial map of MD40 with proposed site identified for bridge parti. A bridge parti work best with a vista along its axis and an access road passing between buildings, as seen above.

The goal of a site with presence in the community is also very adequately provided for by this organizing principle.

However, a bridge parti is also heavy with challenges. A site above the highway brings with it specific concerns about noise, air quality, vibration, and distraction. The structure required to span the highway would likely be very expensive, a pitfall that a public school in this county would have difficulty overcoming in reality. Also, the program of this high school, like most others, requires a number of access points for service needs. Cafeterias, construction

labs, auto labs, and building service areas all have “dirty” sides that would be difficult to hide from public view if using an “exposed” parti like the bridge.

This particular parti looked to be most beneficially located on a site north of the intersection of MD40 and Ebenezer Road, as shown in Figure #-#. The benefits of this site location for the bridge parti are a visual connection to the Chesapeake Bay to terminate the visual corridor created between the volumes of building traversing the bridge and an existing vehicular access road for car and bus drop offs in the form of Red Lion Road to the north. The site is also close enough to MD40-Ebenezer Road intersection to support development occurring along MD40, MD43 to the south west and Route 7 to the north.

Parti B: Compact

A compact parti as illustrated in Figures #-# and #-# is also a good foundation for a school of strong design. The parti provides an armature for a very clear organization of program elements. For example, one could separate grades by floor and subject matters by location about the building’s center. This explicit clarity is intelligent for school design as it promotes easy wayfinding, a benefit to nervous ninth graders, visitors, and the visually impaired alike. A compact parti is also a very sustainable parti because it accommodates a large amount of program on a small (relatively speaking) site. A compact parti for the amount of intended program will naturally lead to a mid-rise building. This height and bulk provides a fine canvas for designing a building with community identity and a civic presence. Another added benefit is that the height of the

Fig. 6-02: Aerial map of MD40 with proposed site identified for compact parti. A compact parti's strengths are command over its context, views, and an iconic presence. These two locations use the advantages to influence the streetscape.

structure would allow the building to take advantage of views to natural elements, such as the Chesapeake Bay, without being sited right alongside it.

The negatives of the compact parti are mixed in character, like those of the bridge, and equally in need of consideration. First, a compact parti as represented in this document will have to contend with multiple formal allusions to other building types. Most favorably, a person might compare its size and volume to a castle or government office building and least favorably, to a prison. Second, the parti locates a large percentage of the program to the center where access to natural light and ventilation is either impossible or unreasonable. A third concern is the site design that would accompany a compact parti. In chapter one, current schools were described as being "marooned among alternating oceans of grass and asphalt and clinging to a meandering bus loop lifesaver as the only means of connection to a community drifting out of reach." Wouldn't a compact parti surrounded by parking and/or playing fields be guilty of this same transgression?

The compact parti would not engage its site in a designed way. It would dominate it.

Being smaller in footprint, the compact parti is more flexible in its siting. Two sites were considered as potentially being most beneficial to the overall success of the school. The first location, right on the intersection of MD40 and Ebenezer Road, would promote a new community center with the school as a major player. This is a desirable arrangement in contrast to conventional practice that places schools on the periphery of the communities they serve. It is also the location most responsive to the access needs of communities along Ebenezer Road on the south side of MD40. The second location is similar to that of the bridge parti, slightly north of the MD40-Ebenezer intersection. This location would take advantage of natural amenities most dramatically and be less intrusive to the existing buildings along MD40. This location would also create a scenario where the school fronts MD40. Combine this with some sympathetic development by the neighboring properties and one starts to turn MD40 into a bit of a main street. Well planned development along these lines could, in the end, create a scenario of even greater unification of the two sides of the street than the bridge parti would attain.

Parti C: Campus

The campus parti is one that is very familiar in higher education and also high school education in warm climates, but rarely seen in public schools in this region. However, the merits that make it popular elsewhere are auspicious for the

goals of this thesis as well. The campus parti has a strong potential to engage its site in a designed way. It can also reduce an overwhelming amount of program into buildings of a more personal scale. This parti also functions well with a number of small parking lots, a claim that many other school organization diagrams cannot make. A campus parti can be accomplished through a wider means of construction methods than schemes with bulkier

Fig. 6-03: Aerial map of MD40 with proposed site identified for campus parti. A campus parti works best with a visual connection rather than a literal connection to MD40 and an arrangement creating accessibility from more than one road.

buildings, which is good for cost considerations. On the issue of site disturbance, a number of smaller buildings can more easily be lifted off the ground than a large one. More pieces of the program are also exposed to natural light as there are more exterior building faces. Circulation space, theoretically, can also be minimized in smaller buildings as one could design buildings with program off of a common lobby rather than a long corridor. Lastly, a campus parti would address one of the growing hot button issues in today's culture: adolescent

obesity. A campus parti would promote more walking and time spent in the outdoors and help to fight this epidemic.

The logistics of safety are one disadvantage of a campus plan. In a single building, the main office can easily monitor everyone and everything that goes in or out of the school. With multiple buildings, a safeguard is needed in each building to maintain a safe environment. There are also some issues of expense to contend with. To make a campus parti a strong land use parti, the different buildings all want to be three stories or higher. This requires egress stairs and elevators for all the buildings. Campus-wide this would lead to "wasted" space, which is not in line with sustainable design. This line of thinking would also extend to toilets and school resources. Many buildings would necessitate redundancy in these areas, which costs schools money they do not want to spend.

The selected site for a campus parti is a piece of land between Red Lion Road and Route 7 (see Fig. #-#). This location was most beneficial because it allowed the school space to incorporate playing fields within the campus of buildings, multiple access points to multiple parking lots, and a context of buildings resonant with the expected scale of the multiple campus buildings. A visual connection to MD40 can also be reasonably expected as Red Lion Road is approximately 12'-15' above MD40 and the most prominent building of the campus would likely stretch to four stories above grade. From this elevated position, the same beneficial views held by alternate sites can still be enjoyed to a degree. This site, however, does not address the issue of connectivity of communities across MD40 in any tenable way.

Comments from the First Design Meeting

A summary of the design committee's comments from the first design meeting seems an appropriate interlude here. The general reaction was most favorable towards the bridge parti contingent on the incorporation of some of the ideals of the other two. The compact nature of the compact parti was asked to be pursued as progress in design is made. The form however was thought of as prison like. Making a small campus of buildings to the north was suggested to work with a main block of program spanning MD40 as a highway. The noisy construction trades were suggested as a possible piece to break off, though with concern for the social perceptions that might result. Destination on the south side of the bridge was a concern as the motivation for why one would cross the bridge was questioned. The initial solution was to locate community friendly spaces like the gym, library, or auditorium on this end to give people to cross and mitigate the changes in grade from one side of MD40 to the other. The practical disadvantages of the bridge parti mentioned above were mentioned as concerns, but design solutions seemed achievable from preliminary discussions. An ideal site for the building was not identified as apprehension arose over the nearness of any school in this area to existing high schools in the region. An exploration into a new location supported by new road infrastructure was suggested.

Chapter 7: Formal Review Presentation Graphics

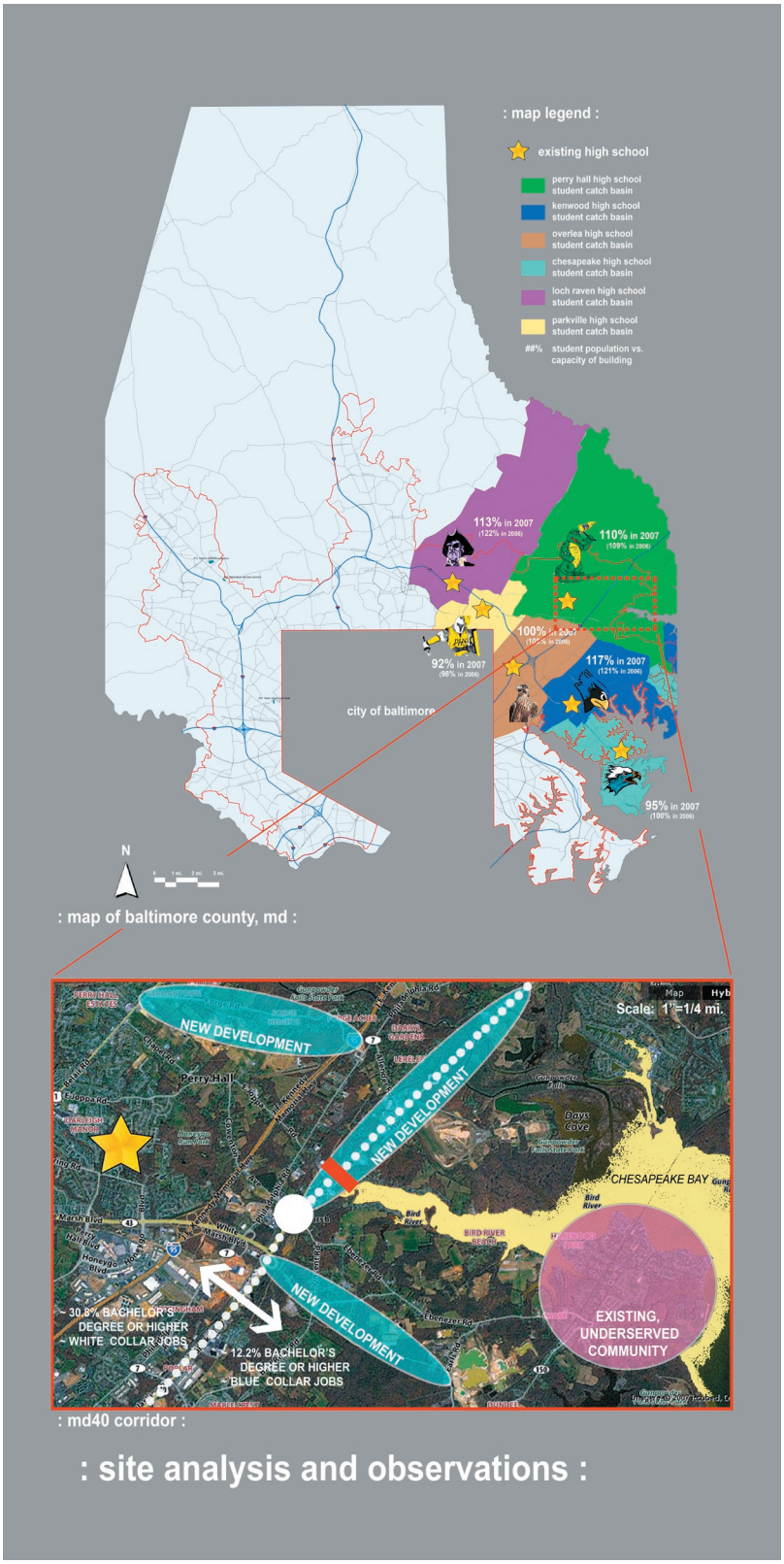


Fig. 7-01: Formal review presentation graphic. Local high school jurisdiction and site analysis graphics describe rationaled for selected school location.

Fig. 7-02: Formal review presentation graphic. Site aerial of proposed high school campus, looking from the southwest.

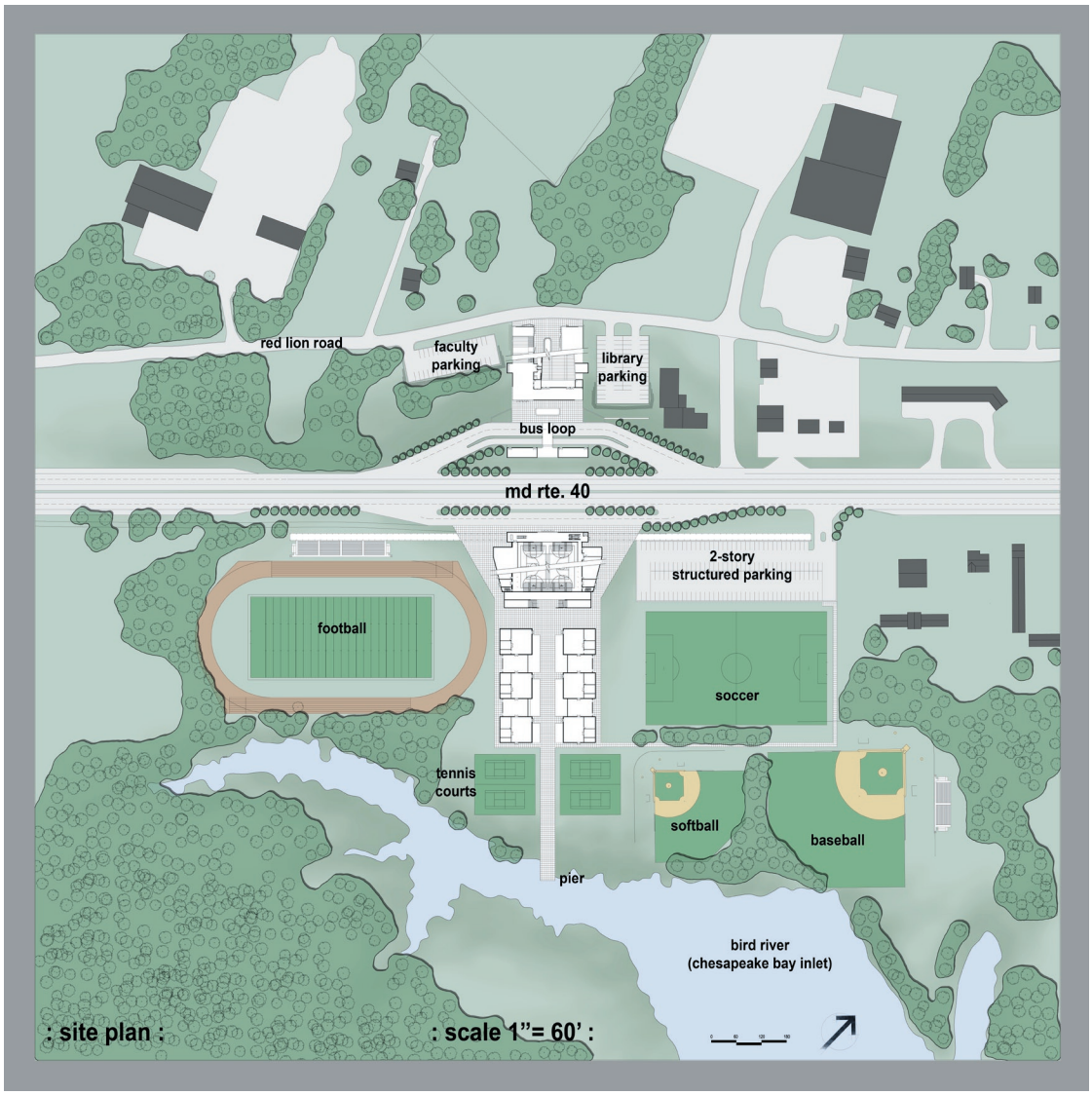


Fig. 7-03: Formal review presentation graphic. Site plan for proposed high school campus.

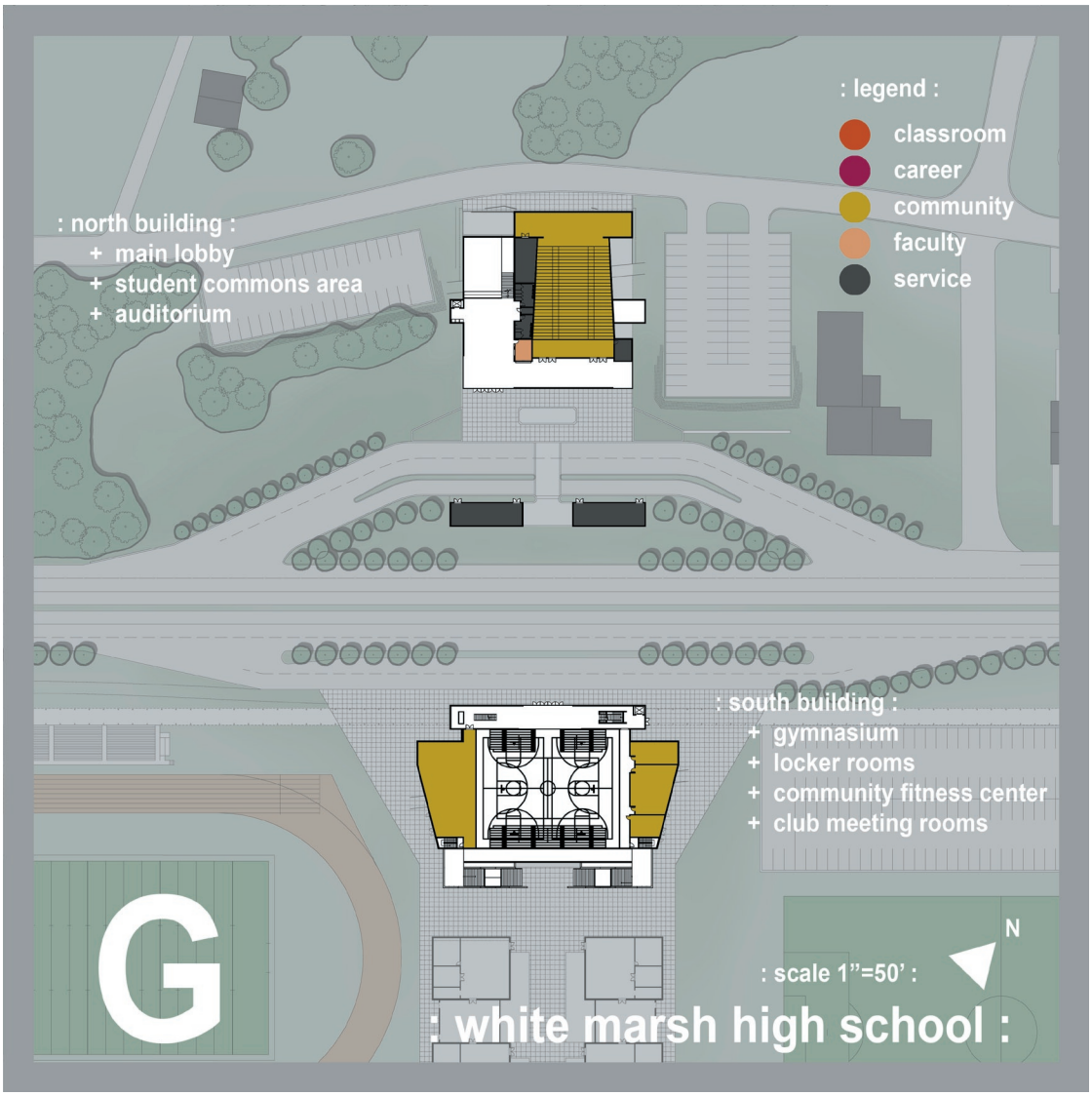


Fig. 7-04: Formal review presentation graphic. Ground floor plan of proposed high school.

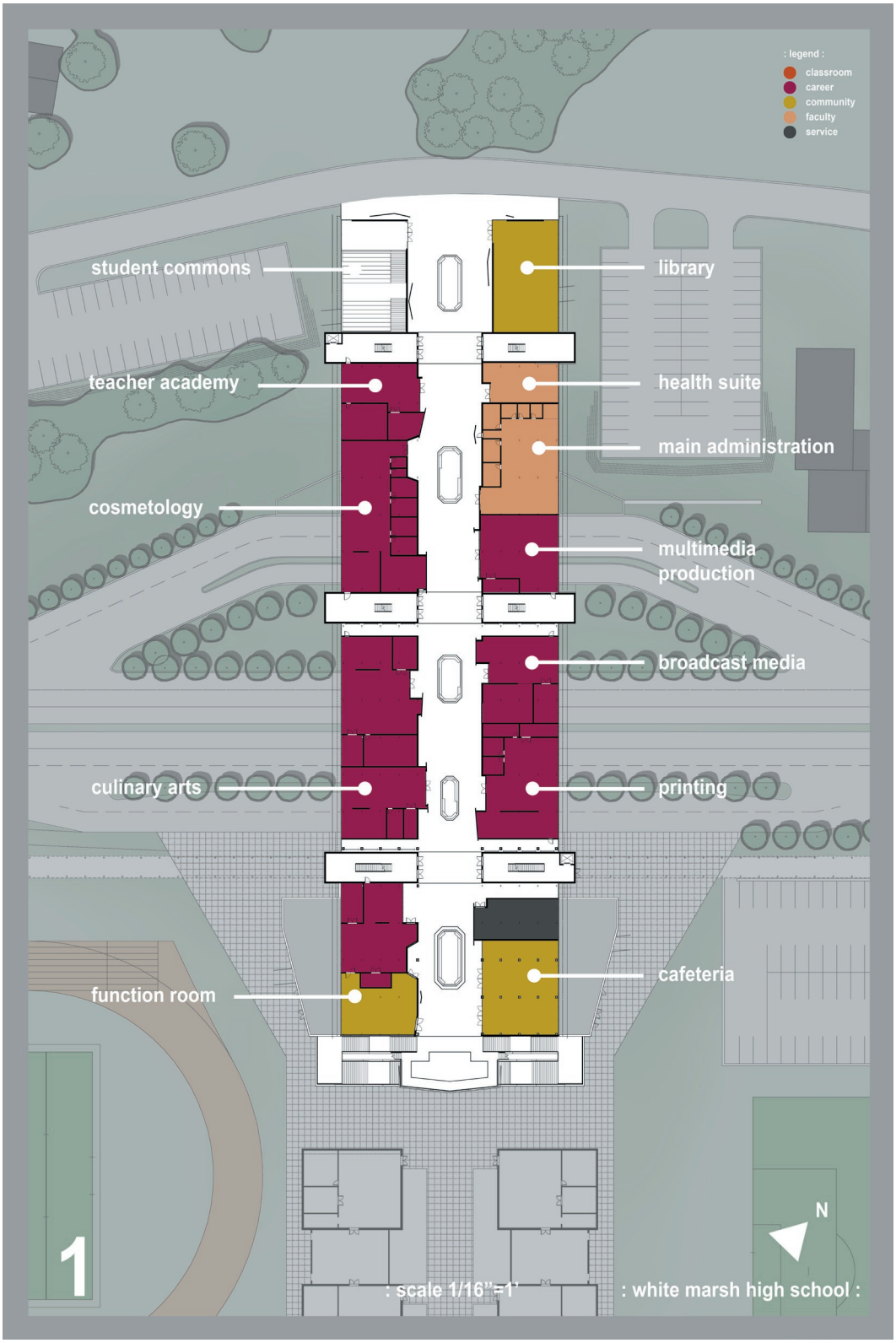


Fig. 7-05: Formal review presentation graphic. First floor plan of proposed high school.

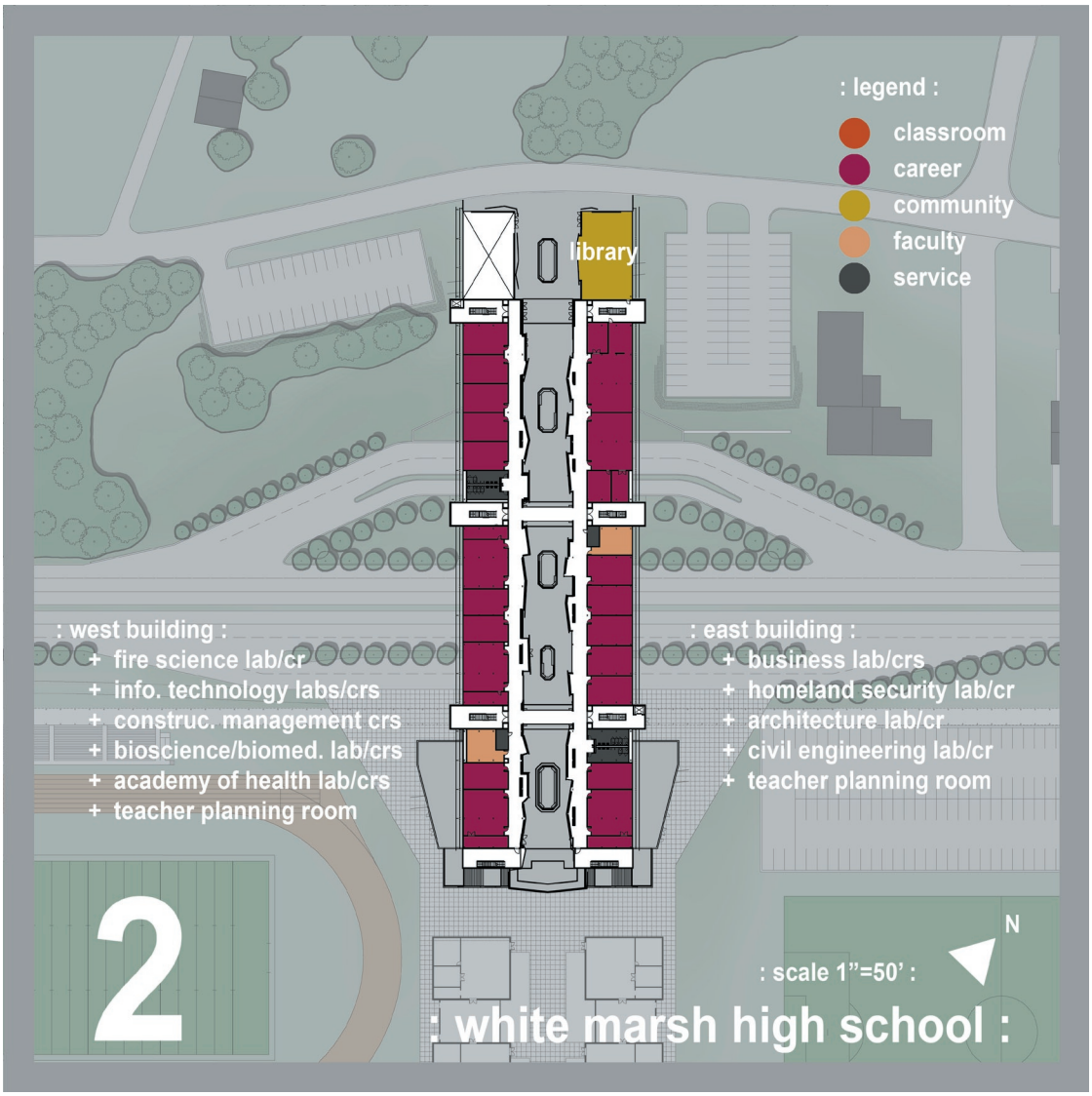


Fig. 7-06: Formal review presentation graphic. Second floor plan of proposed high school.

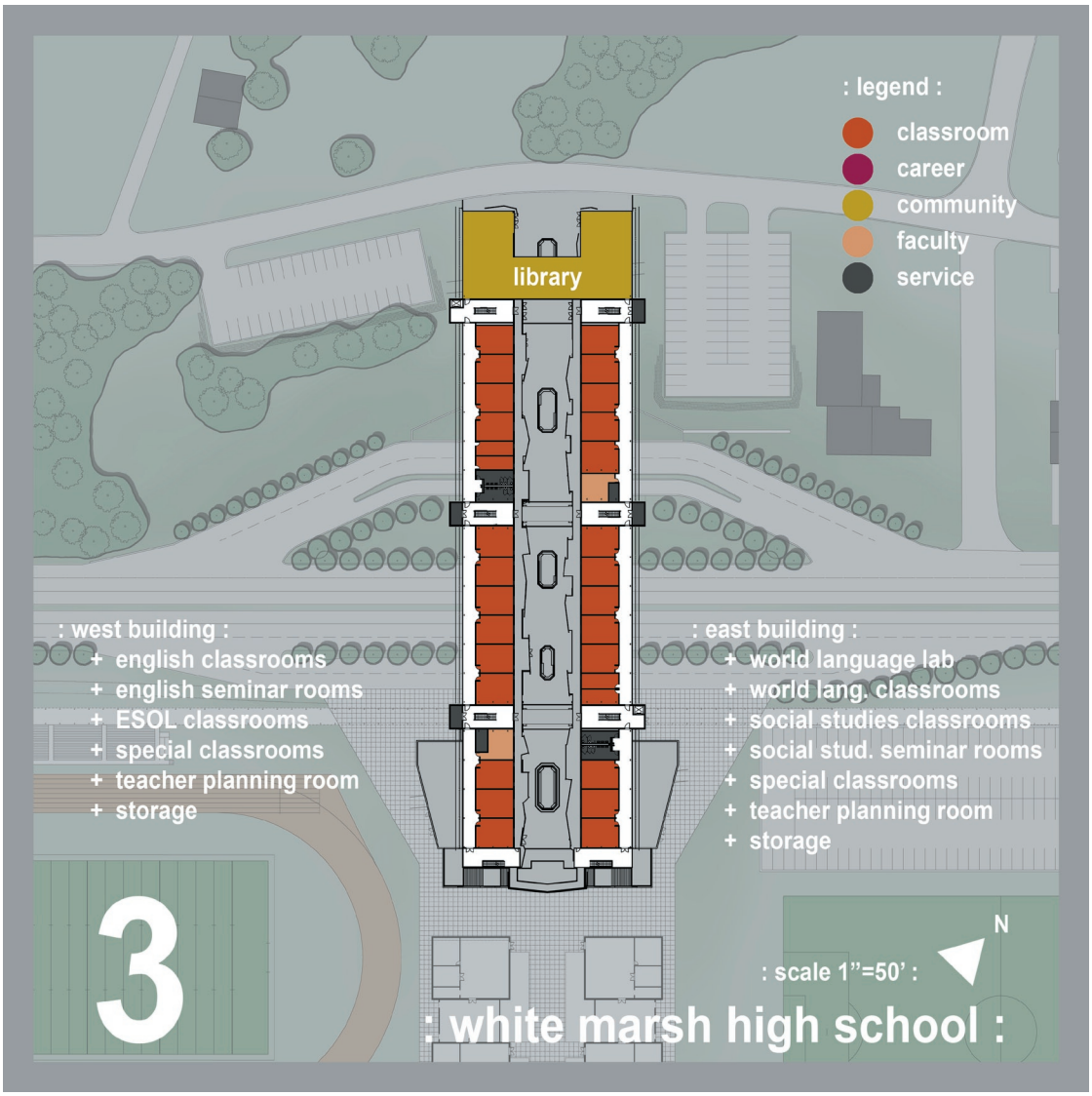


Fig. 7-07: Formal review presentation graphic. Third floor plan of proposed high school.

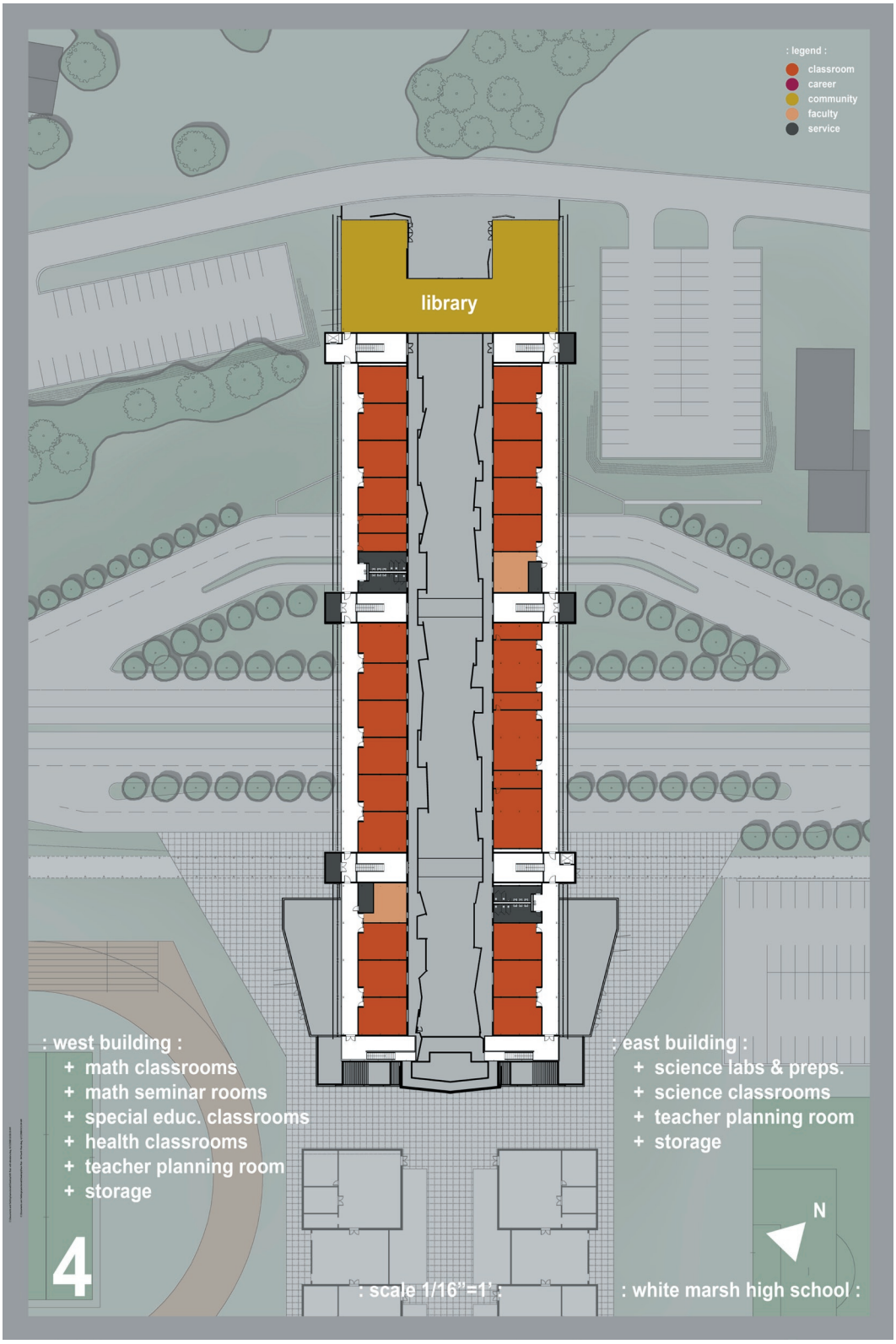


Fig. 7-08: Formal review presentation graphic. Fourth floor plan of proposed high school.

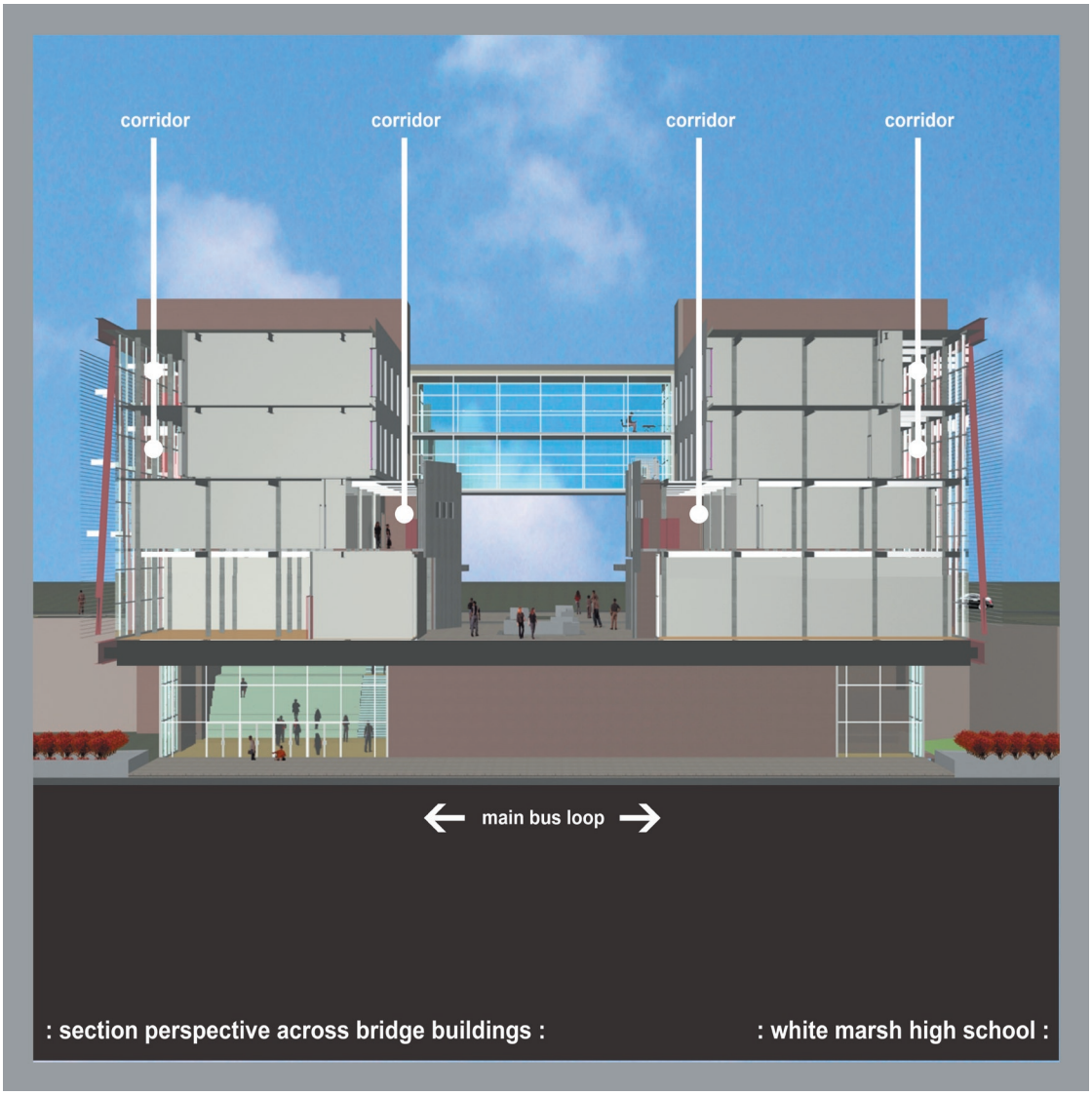


Fig. 7-09: Formal review presentation graphic. Section perspective cut through buildings/bridge crossing MD40. Location by floor of circulation space noted.

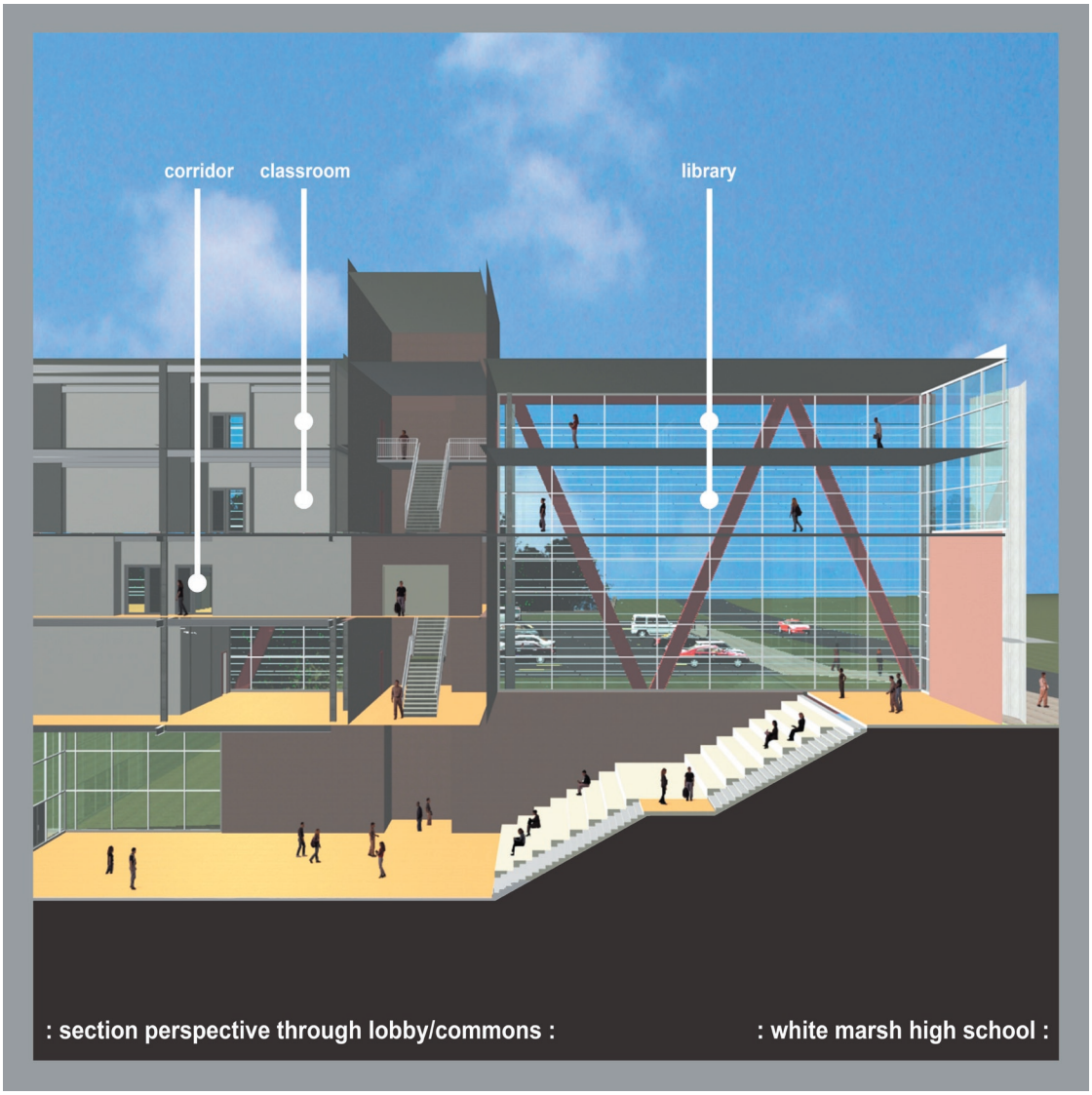


Fig. 7-10: Formal review presentation graphic. Section perspective through atrium, library, and lobby.

Fig. 7-11: Formal review presentation graphic. Perspective view down 1st floor pedestrian avenue from south stair landing.

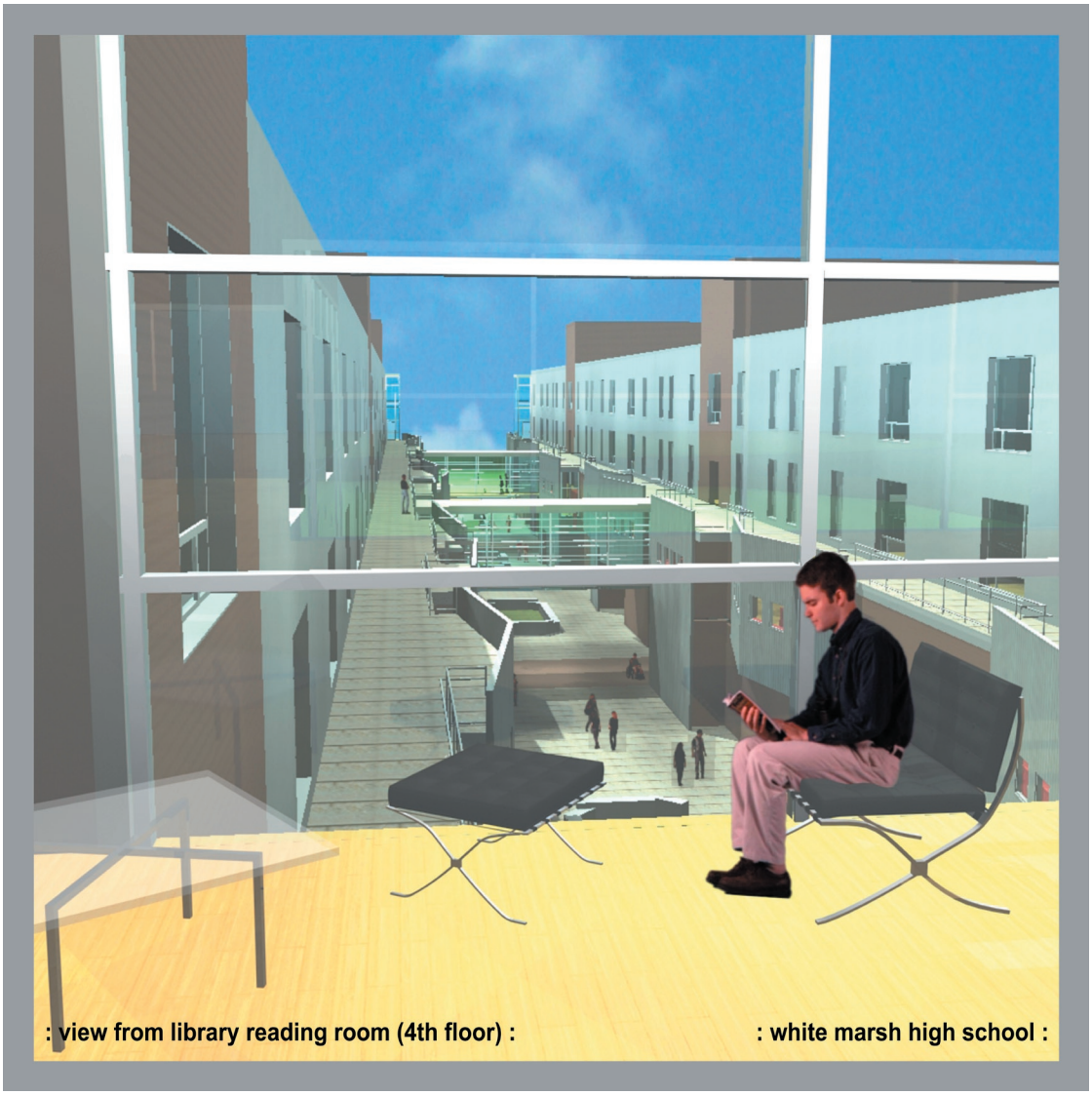


Fig. 7-12: Formal review presentation graphic. Perspective view between buildings from 4th floor library reading room.

Fig. 7-13: Formal review presentation graphic. Perspective view from bridge crossing between buildings.

Fig. 7-14: Formal review presentation graphic. Perspective view down second floor corridor.

Fig. 7-15: Formal review presentation graphic. Perspective view of south end of building from construction trade "street".

Fig. 7-16: Formal review presentation graphic. Perspective view of atrium terraced seating area from lobby.

Fig. 7-17: Formal review presentation graphics. Above, site section and west elevation of building. Below, perspective view of east facade of building while drivng along MD40

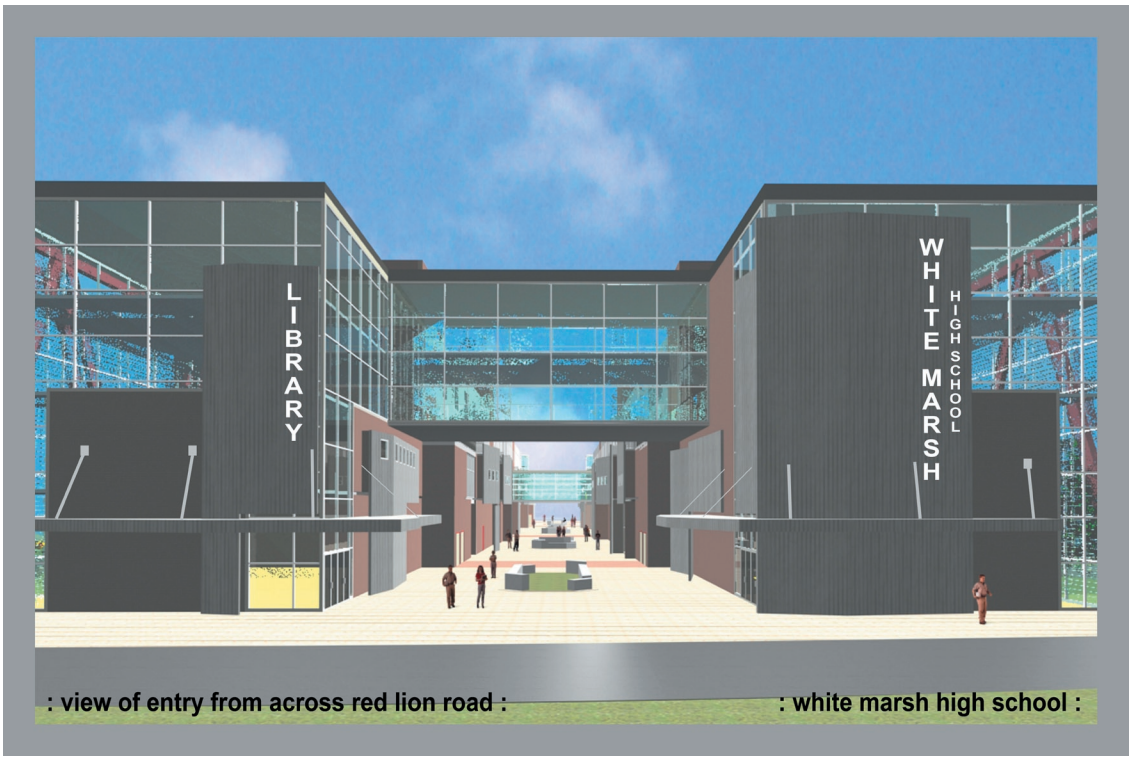


Fig. 7-18: Formal review presentation graphic. Perspective views of entry to pedestrian avenue along Red Lion Rd.

Chapter 8: Conclusions

May 10 , 2008 – Three Weeks after Final/Formal Review

Site Conclusions

Over the course of the design process, the location chosen to site the building proved to be more prudent than first suspected. This conclusion primarily comes from recognition of potential in the site that was not originally considered. In retrospect, the strongest impetus for selecting the building's site was the issue of MD40 acting as a barrier that needed crossing. This goal was accomplished. However, were the idea of making connections across MD40 not of any consideration in the discussion of siting the building, the same site could have been considered for another reason. Often times, the timeline of school development runs as follows: [1] a strong community grows too large for its school facilities, [2] as no site of size is available within the community, a site is selected on the undeveloped periphery, [3] a school is built, [4] houses/developments are built around the school, [5] the population spreads out or outside populations come in. However, in this case the site selected is not peripheral. It is a site already between communities that was once of great esteem but now has lost much of its original value due to the interstate drawing traffic away. The region needs new value, something a school and the resulting housing can provide. Currently, the site is well served by a nearby water amenity, park amenity and shopping amenity that are wasted on a light industrial and commercial use. A change would be wise to make best use of these beneficial circumstances.

To this end, the thesis was not served well by a lack of two explorations: [1] context, and [2] a community master plan. In terms of theory, one could argue the merits of this region being transformed to a mixed use community with a large residential component. However, without a sense of the bulk of the buildings that result, it was difficult to evaluate the school's bulk related to context. Compared to the sparse, existing conditions, the school building would look to be a monster. It was conceived that mid-rise housing would be an ingredient in the development solution along MD40, as high population numbers are expected due to BRAC action to the north. If this were designed, the site selection would be bolstered.

Likewise, without a master plan for community development north of MD40, it is difficult to convince any of the value of a building as connector. If a community to the north was, for example, planned with a green space or pedestrian/biker friendly avenue running from Philadelphia Rd. to Red Lion Rd., the value of the school building connecting residents to green space would be strengthened, for there would be a straight line connection for a greater sphere of residents to get to the school and the amenities beyond. Extending Joppa Rd. (a consideration some weeks ago in the process) would also enhance connectivity between the school and surrounding communities, as well as improve traffic flow. Also, considerations related to support schools in the area would benefit from actual siting in a master plan. It has been a consistent thought during the thesis process that a new middle school would be sited on the south side of MD40 a short distance away from the high school. With this location, field space and

parking in the structured garage could be shared, further enriching the sustainability of the thesis. Not mapping this thought on paper leaves a void.

Program Conclusions

The primary conclusion related to program is that the thesis would have been better served by a more unique appraisal of what the building actually is. The goal was community involvement, but the methods for getting there were hopeful and vague. In retrospect, describing the school as a Community Learning Center (CLC) would have been a more fruitful approach. In many ways, the school as designed has the tools to function as a CLC, but were the program considered wholeheartedly as such from the start, better results would have followed. Another alternative, which was brought up at the final review, was considering the program as a town center more than a school. School program could and should be considered a component of this, but perhaps in place of the vocational elements of the school, municipal elements of a community could have been added. For example, post offices have historically been the key to keeping small town centers viable. If a post office were added to the avenue level of the school building, it would more reasily ensure activity on the pedestrian level than proposed school-focused, vocational activities, such as culinary arts.

Architectural Conclusions

The resultant architectural solution to this thesis endeavor is memorable (or brandable), creates a civic space in the pedestrian avenue, achieves a transparency between the student and the community around, and stacks a lot of

program into an efficient mass. It is also out of scale to both the pedestrian between buildings and motorists passing underneath the building on MD40. A few reactions come to mind. First, perhaps the parti selected and the amount of program inserted into it were incongruous. If, for example, the top level were removed and the student population was reduced accordingly, the solution as designed may have been more reasonably scaled. Second, much of the success of this design scheme relies on articulation of detail that was unexplored in this thesis. On the exterior skin, articulation of the curtain wall façade needed to be examined on a pane by pane basis, perhaps varying the level of transparency of glass or controlling the pane proportions better. Likewise, the louvered sun/sound control construction should have been pulled back in some areas to allow for more variety in lighting and appearance. Color on walls beyond the wall would also have been a worthwhile exploration as it would reduce some of the cold, institutional character of the exterior skin. All of these moves would aid in reducing the perceived scale of the building from the outside.

Along the pedestrian avenue between buildings, a similar approach is needed. The entrances to the vocational clusters, in particular, would have benefited from more care at creating a human scale experience. This would be accomplished through, again, some work with the storefronts at each entrance. Also, articulation in the masonry, canopies or awnings, the addition of human scale accessories like benches or furniture, and signage would help. As described previously, if the height of the building was reduced from four to three stories the

railed overlook could have been 15’ above the avenue level instead of 27’. This would have helped the scale miscue profoundly.

There was one prominently designed interior space in the thesis. It was the student commons terrace with stairway. It also struggled with scale. The space was designed with two functions in mind: service as a small, informal assembly space and as a “watering hole” for students to meet and gather. In achieving the scale of the former, the latter suffered. The resulting space was too big and too sterile to be a good place for student gathering. Furniture would have helped in the rendering, but not enough to hide its poor design. If the height to be traversed by the stairs in the space were less than the 25’ that was the reality, it may have been more successful as well. Such a large height, in the end, was not able to be overcome.

The exposed structural system as designed was not successful. Scale was an issue, as was believability and physical functionality. A key factor in this was the structural expression departing from the truest diagram of bridge design. The final design resembled a lukewarm hybrid between a truss bridge and a suspension bridge, which while reasonable, was probably a poor decision. If a truss bridge was the intention, the stanchions should have been cut down. If the stanchions are most desirable, make a suspension concept work and get rid of the heavy structure. One of the most egregious sins was the avoidance of design of the “cross” structure, as it was difficult to bring in line with other design intentions. If a suspension option were pursued, this would not have been needed structurally (as I understand the diagram for suspension bridges). Or one could

have taken the third approach, and make a building with no reference to a bridge whatsoever. Hide how the building crosses the highway inside, as other examples have done.

The site architecture, which mainly took the form of playing fields and pathways seemed to work out well. A number of enjoyable field experiences were created. A baseball diamond with a watery target over the outfield fence would be an exciting environment for a young player. Likewise, the football stadium with "curb appeal" to MD40 would make for an exciting community event. Motorists passing by would see the field lit up with lights and excitement as they pass beneath an illuminated glass tube school building stretching across the street. Accessibility and connection to the water was also successfully handled through the community pier, useful for launching boats or simply meeting and talking with friends. A language of furnishing including covered walks was thought of and minimally noted in the final design, but there is opportunity for it to be implemented well with the layout of fields as shown in the site plan.

Appendices

Part 1	SPACE	EDUCATIONAL SPECIFICATIONS # of Rooms	Area Per Room	PROGRAM SQFT	SCHEMATIC DESIGN ACTUAL SQ FT	DIFFERENCE
A	**ENGLISH**					
	Classrooms	8	800	6400		(6400)
	Seminar Room	2	400	800		(800)
	Storage *	1	200	200		(200)
	Teacher Resource Stations	8	75	600		
				8000		
B	**MATHEMATICS**					
	Classrooms	8	800	6400		(6400)
	Seminar Room	1	400	400		(400)
	Storage *	1	200	200		(200)
	Teacher Resource Stations	8	75	600		(600)
				7600		
C	**SCIENCE**					
	Biology- Lab	1	1040	1040		(1040)
	Chemistry- Lab	1	1125	1125		(1125)
	Physics- Lab	1	1115	1115		(1115)
	Science, Technology & Society Lab	1	0	0		
	Prep Rooms	1	310	310		(310)
	Prep Rooms	1	545	545		(545)
	Prep Rooms	1	345	345		(345)
	Classroom	8	800	6400		(6400)
	Teacher Resource Stations	12	75	900		
				11780		
D	**WORLD and CLASSICAL LANGUAGES**					
	Classroom/ Carrell Dock	4	800	3200		(3200)
	Multimedia Computer Language Lab	1	1000	1000		(1000)
	Storage *	1	200	200		(200)
	Teacher Resource Stations	5	75	375		
				4775		
E	**ESOL**					
	Classrooms	2	800	1600		(1600)
	Storage *	1	200	200		(200)
	Teacher Resource Stations	2	75	150		
				1950		
F	**SPECIAL EDUCATION**					
	Classrooms	8	750	6000		(6000)
	Storage	1	200	200		(200)
	Teacher Resource Stations	8	75	600		
				6800		
G	**SOCIAL STUDIES**					
	Classrooms	6	800	4800		(4800)
	Seminar Room	2	400	800		(800)
	Storage *	1	200	200		(200)
	Teacher Resource Stations	6	75	450		
				6250		
H	**VISUAL AND PERFORMING ARTS**					
	Music/ Drama	1	800	800		(800)

Part 1	SPACE	EDUCATIONAL SPECIFICATIONS # of Rooms	Area Per Room	PROGRAM SQFT	SCHEMATIC DESIGN ACTUAL SQ FT	DIFFERENCE
	Art Classroom/ Laboratory	1	1200	1200		(1200)
	Band Room (On stage)	1	1150	1150		(1150)
	Auditorium	1	4900	4900		(4900)
	Stage	1	1575	1575		(1575)
	Storage	1	600	600		(600)
	Teacher Resource Stations	2	75	150		
				10375		
I	**HEALTH EDUCATION**					
	Classroom/ Computer Lab	2	800	1600		(1600)
	Storage *	1	200	200		(200)
	Teacher Resource Stations	2	75	150		
				1950		
J	**PHYSICAL EDUCATION**					
	Gymnasium	1	9000	9000		(9000)
	Weight Room- Boy/ Girls	1	600	600		(600)
	Storage	1	270	270		(270)
	Office	1	340	340		(340)
	Ticket Sales	1	100	100		(100)
	Female Coach Office	1	280	280		(280)
	Male Coach Office	1	280	280		(280)
	Toilet	1	200	200		(200)
	Concessions Room	1	250	250		(250)
	Aux Gym	1	1470	1470		(1470)
	Storage for Aux. Gym (Basement)	1	400	400		(400)
	Showers/ Lockers, Boys (Basement)	1	4600	4600		(4600)
	Showers/ Lockers, Girls (Basement)	1	3875	3875		(3875)
	Storage	1				0
	Laundry	1				0
	Pool Equipment	1				0
	Teacher Resource Stations	2	75	150		
				21815		
K	**POOL**					
	Pool (Basement)	1	6900	6900		(6900)
						0

Part 2	SPACE	EDUCATIONAL SPECIFICATIONS # of Rooms	Area Per Room	PROGRAM SQFT	SCHEMATIC DESIGN ACTUAL SQ FT	DIFFERENCE
A	**COMMUNICATION AND BROADCAST TECHNOLOGY**					
	Studio	1	1200	1200		(1200)
	Classroom	1	800	800		(800)
	Storage (lockable room)	1	400	400		(400)
	Teacher Resource Station	1	75	75		
				2475		
B	**PRINTING TECHNOLOGIES**					
	Classroom	1	800	800		(800)
	Production/ Fabrication Lab	1	1500	1500		(1500)
	Dark Room	1	200	200		(200)
	Tool and Material Storage	1	200	200		(200)
	Clean Storage	1	150	150		(150)
	Paint Storage	1	150	150		(150)
	Teacher Resource Stations	1	75	75		
				3075		
C	**MULTIMEDIA PRODUCTION AND TECHNOLOGY**					
	Computer Lab	1	2000	2000		(2000)
	Storage	1	200	200		(200)
	Teacher Resource Stations	2	75	150		-150
				2350		
D	**FINANCE ACADEMY (NAF)**					
	Classroom/Lab	1	1000	1000		(1000)
	Teacher Resource Stations	1	75	75		-75
				1075		
E	**FINANCE AND ACCOUNTING**					
	Classroom/ Lab	1	1000	1000		(1000)
	Teacher Resource Stations	1	75	75		-75
				1075		
F	**MARKETING**					
	Classroom/Lab	1	1000	1000		(1000)
	Teacher Resource Stations	1	75	75		-75
				1075		
G	**BUSINESS ADMINISTRATIVE SERVICES**					
	Classroom/Lab	1	1000	1000		(1000)
	Teacher Resource Stations	1	75	75		-75
				1075		
H	**BUSINESS MANAGEMENT**					
	Classroom/Lab	1	1000	1000		(1000)
	Teacher Resource Stations	1	75	75		-75
				1075		
I	**CULINARY ARTS**					
	Commercial Kitchen Lab	1	1400	1400		(1400)
	Baking Kitchen Lab	1	1400	1400		(1400)
	Classrooms	2	600	1200		(1200)
	Storage	2	200	400		(400)
	Walk-in coolers	2	150	300		(300)
	Laundry Room	1	100	100		(100)

Part 2	SPACE	EDUCATIONAL SPECIFICATIONS # of Rooms	Area Per Room	PROGRAM SQFT	SCHEMATIC DESIGN ACTUAL SQ FT	DIFFERENCE
	Function Room	1	1000	1000		(1000)
	Teacher Resource Stations	2	75	150		-150
				5950		
J	**COSMETOLOGY**					
	Lab	1	2000	2000		(2000)
	Reception/Waiting	1	300	300		(300)
	Classrooms	2	600	1200		(1200)
	Lockers	2	200	400		(400)
	Dispensary	1	200	200		(200)
	Laundry Room	1	100	100		(100)
	Toilet	2	75	150		(150)
	Back-up Product Storage	1	100	100		(100)
	Teacher Resource Stations	2	75	150		-150
				4600		
K	**CARPENTRY**					
	Classroom	1	500	500		(500)
	Production/ Fabrication Area	1	2000	2000		(2000)
	Storage	1	400	400		(400)
	Lockers	1	200	200		
				3100		
L	**MASONRY**					
	Classroom	1	500	500		(500)
	Production/ Fabrication Area	1	2000	2000		(2000)
	Storage	1	400	400		(400)
	Lockers	1	200	200		
				3100		
M	**ELECTRICAL**					
	Classroom	1	500	500		(500)
	Production/ Fabrication Area	1	2000	2000		(2000)
	Storage	1	400	400		(400)
	Lockers	1	200	200		
				3100		
N	**HVAC**					
	Classroom	1	500	500		(500)
	Production/ Fabrication Area	1	2000	2000		(2000)
	Storage	1	400	400		(400)
	Lockers	1	200	200		
				3100		
O	**PLUMBING**					
	Classroom	1	500	500		(500)
	Production/ Fabrication Area	1	2000	2000		(2000)
	Storage	1	400	400		(400)
	Lockers	1	200	200		
				3100		
P	**CIVIL ENGINEERING/ARCHITECTURE**					
	Classroom	1	500	500		(500)
	Production/ Fabrication Area	1	2000	2000		(2000)
	Storage	1	400	400		(400)
				2900		
Q	**ARCHITECTURAL DRAFTING/DESIGN**					
	Classroom	1	500	500		(500)

Part 2	SPACE	EDUCATIONAL SPECIFICATIONS # of Rooms	Area Per Room	PROGRAM SQFT	SCHEMATIC DESIGN ACTUAL SQ FT	DIFFERENCE
	Production/ Fabrication Area	1	2000	2000		(2000)
	Storage	1	400	400		(400)
				2900		
R	**CONSTRUCTION MANAGEMENT**					
	Classroom/Lab	1	1000	1000		(1000)
	Teacher Resource Stations	1	75	75		-75
				1075		
S	**CONSTRUCTION MAINTENANCE**					
	Classroom/Lab	1	1000	1000		(1000)
	Teacher Resource Stations	1	75	75		-75
				1075		
T	**BIOSCIENCE ENGINEERING**					
	Classroom	1	700	700		
	Lab	1	1400	1400		
	Storage *	1	350	350		
	Teacher Resource Stations	1	75	75		
				2525		
U	**BIOMEDICAL SCIENCES**					
	Classroom	1	700	700		
	Lab	1	1400	1400		
	Storage *	1	350	350		
	Teacher Resource Stations	1	75	75		
				2525		
V	**ACADEMY OF HEALTH PROFESSIONS**					
	Classroom	1	700	700		
	Lab	1	1400	1400		
	Storage *	1	350	350		
	Teacher Resource Stations	1	75	75		
				2525		
W	**PRE-ENGINEERING**					
	Classroom	1	700	700		
	Lab	1	1400	1400		
	Storage *	1	350	350		
	Teacher Resource Stations	1	75	75		
				2525		
X	**MANUFACTURING**					
	Classroom	1	700	700		
	Lab	1	1400	1400		
	Storage *	1	350	350		
	Teacher Resource Stations	1	75	75		
				2525		
Y	**IT NETWORKING**					
	Classroom/Lab	1	1000	1000		(1000)
	Teacher Resource Stations	1	75	75		-75
				1075		
Z	**ACADEMY OF INFORMATION TECH.**					
	Classroom/Lab	1	1000	1000		(1000)

Part 2	SPACE	EDUCATIONAL SPECIFICATIONS # of Rooms	Area Per Room	PROGRAM SQFT	SCHEMATIC DESIGN ACTUAL SQ FT	DIFFERENCE
	Teacher Resource Stations	1	75	75		-75
				1075		
AA	**FIRE SCIENCE**					
	Classroom/Lab	1	1000	1000		(1000)
	Teacher Resource Stations	1	75	75		-75
				1075		
BB	**HOMELAND SECURITY**					
	Classroom	1	700	700		
	Lab	1	1400	1400		
	Storage *	1	350	350		
	Teacher Resource Stations	1	75	75		
				2525		
CC	**TEACHER ACADEMY**					
	Classroom	1	700	700		
	Lab	1	1400	1400		
	Storage *	1	350	350		
	Teacher Resource Stations	1	75	75		
				2525		

Part 3	SPACE	EDUCATIONAL SPECIFICATIONS # of Rooms	Area Per Room	PROGRAM SQFT	SCHEMATIC DESIGN ACTUAL SQ FT	DIFFERENCE
A	**ADMINISTRATIVE SUITE**					
	Principal	1	200			0
	Assistant Principal	4	160			0
	Secretary & Reception	1	350			0
	Partnership Liaison	1	125			0
	Work-Base Coordinator	1	125			0
	Business Manager	1	125			0
	Parent Liaison	1	125			0
						0
	Conference Room	1	400			0
	Work Room/ Mail Room	1	600			0
	Guidance:					
	Guidance- Offices (3)					0
	Guidance- Conf. Room					0
	Guidance- Storage					0
	Guidance- Reception (shared with SSS)					
	Department Heads (9)	9	120	1080		0
B	**INFORMATION RESOURCE CENTER**	1	3125	3125		0
C	**CAFETERIA AND FOOD SERVICES**					
	Cafeteria	1	5830	5830		0
	Kitchen	1	1740	1740		0
D	**HEALTH SUITE**	1	800	800		(800)
	Rest Area					
	Storage					
	Wait/ Treatment					
	Office					
	Toilets (2)					
E	**STUDENT SUPPORT SERVICES**	1				
	Offices (6)					0
	Records Room					0
	Conference Room					0
	Reception (shared with Guidance)					0
F	**STAFF SUPPORT SERVICES**	1				
	Faculty Lounge					0
G	**MAINTENANCE OPERATION**	1				
	TEACHER RESOURCE:					
	1ST FLOOR					

Part 3	SPACE	EDUCATIONAL SPECIFICATIONS # of Rooms	Area Per Room	PROGRAM SQFT	SCHEMATIC DESIGN ACTUAL SQ FT	DIFFERENCE
	TR #1:					
	Business			375		
	Health			150		
	Visual/ Performing Arts			150		
	Pysical Education			150		
	TOTAL			**825**		(825)
	TR #2:					
	Tech Ed			225		
	Electrical			75		
	Electronics			150		
	CADD			375		
	Masonry			75		
	HVAC			75		
	Plumbing			75		
	TOTAL			**1050**		(1050)
	2ND FLOOR					
	TR #3:					
	English			675		
	ESOL			150		
	World and Classical Languages			375		
	Culinary Arts			150		
	TOTAL			**1350**		(1350)
	3RD FLOOR					
	TR #4					
	Social Studies			600		
	Special Education			600		
	TOTAL			**1200**		(1200)
	TR #5					
	Science			900		
	Math			675		
	TOTAL			**1575**		(1575)

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Various publicly available documents, including charts and maps, from the Maryland State Department of Education at the website, http://www.marylandpublicschools.org/MSDE and its associated pages.

Various publicly available documents, including charts and maps, from the Baltimore County Public School system, at the website, http://www.bcps.org and its associated pages.