I. INTRODUCTION

A. PURPOSE

Educational Specifications (Ed Specs) were developed to serve as the benchmark for future school renovations and new construction projects. The purpose of the Ed Spec is to define the programmatic, functional, spatial, and environmental requirements for educational facilities, whether new or remodeled.

In essence, an Ed Spec tells the story of the school facility and how the built environment will support the academic program and vision of school leadership. These generic Elementary and Middle School Ed Specs are primarily intended for use as planning guides by architects and project planners, but are also intended to serve as a communication and benchmarking tool for all project stakeholders.

The general concept embodied in the specifications is to provide adequate details for proposed spaces while leaving ample flexibility for creativity and options in design by the architects. Each Ed Spec is meant to be a living document—developed and amended over time.

During the planning phase of a specific project, the Ed Spec is utilized to understand and develop project scopes of work and budgets, while clearly communicating the intent of a project to vendors and thus providing well informed responses to meet actual project needs. Unique site locations of new schools may necessitate floor plan modifications and the program and space requirements should be modified within the parameters of this document. ***A detailed discussion of Urban School Models, used as a tool within the planning phase, is provided in section III.***

During the implementation phase, the Ed Spec will be reviewed for quality control allowing Alexandria City Public Schools (ACPS) to measure project deliverables against the stated benchmarks and standards within the Ed Specs. Design deliverables will also be examined for compliance within the standards with a goal of meeting those benchmarks by 15 percent. Additionally, the Ed Spec will help provide foundational support for project decisions.

The Ed Spec serves as a valuable aid for facility and staff. These are user friendly documents that allow those outside of design and construction professions to understand the building and intent of its spaces.

Planning a state-of-the-art school requires consideration of several influencing factors including historical and community context, the current and future learning pedagogy and curricular goals, technical expertise of faculty and administrators, national and regional trends and benchmarks, as well as strategic goals and objectives.

For school planning, Ed Specs guide the cooperative efforts of facility specialists, administrators, faculty, and instructional consultants, in addition to the careful involvement of outside partners and community stakeholders. In order to create the best possible learning environment for children, efforts have been made to incorporate the best ideas from existing plans and facilities, as well as to anticipate future needs for educating Alexandria's children.

B. PROCESS

The overall workflow for the development of the Ed Specs is shown in figure XX. The process began with a series of discussions devoted to aligning the Ed Spec with the strategic objectives and vision for future schools followed by several weeks of interviews with technical experts, building users, and other stakeholders.

The Project Planning Team was comprised of ACPS and City staff, Studio Twenty Seven Architecture and Brailsford and Dunlavey. The Team solicited community and student input at key intervals to ensure the document considers all perspectives related to facility needs, adjacencies, and space prioritizations. Input from specialists in technology, facility planning, other school divisions, and elementary school pedagogy has been added to the basic plan to ensure quality facilities well into the twenty-first century.

C. STRATEGIC VISION

ACPS staff was guided through a series of visioning sessions with educators, administrators, and community members that challenged them to clarify their expectations related to facility operations, sustainability, architectural quality, space priorities, and the community context. The visioning sessions focused on identifying gaps between ACPS' future goals and their current realities. The following narrative summarizes the areas of greatest need and formulates the concept for the construction and operation of a school of the future in Alexandria.

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a. *Building Concept and Priorities of Spaces.* The desire to teach whenever and wherever drives the need for future facilities to implement a spatial organization that provides both formal and informal learning spaces and maximizes collaboration and interaction between students and faculty.

School designs should focus on creating collaborative and adaptable learning spaces supported by a robust and seamless integration of technology and flexible and ergonomic furniture. Incorporating an overall organization of small learning communities with breakout spaces in hallways (ELA's), collaborative spaces in classrooms, and spaces that facilitate chance interactions throughout the school will allow teachers to collaborate across disciplines and tailor learning objectives and lessons to students' individual needs.

Providing multifunctional spaces for third party partner and community programs that extend educational and extra-curricular services to students, families and the community is a priority. The facility should operate as one organism that can be segmented into different functions and zones depending on the time of day and use.

b. *Community Context.* ACPS school facilities should serve as neighborhood assets and centers for parent, family and community interaction and engagement. Parental and family support plays a critical role in the success of students. ACPS students and families come from diverse backgrounds and schools should be welcoming and inviting places that include dedicated space for parent and family engagement as well as spaces available for community and partnership use.

Each school community is unique and designers should consider what spaces best support the community's needs; however, all schools and their sites should be planned and designed to support community use during non-school hours. Implementing a secure separation between the academic core and the shared use spaces along with the careful application of active and passive design strategies will create safe and secure learning environments. The site also adds opportunities for extended outdoor learning and becomes a neighborhood asset outside of school hours.

c. *Organizational and Operational Paradigm.* ACPS believes an integrated, interdisciplinary team approach increases student achievement and faculty collaboration by enhancing the overall learning experience. A collaborative team approach is best facilitated with small learning communities, extended learning environments, and a departmental organization of spaces. Media Centers should be seen as the "learning commons" and be utilized regularly as an extension of teacher's classrooms and workspaces.

ACPS desires to increase inter-student collaboration and group learning and activities. To support this, flexible and adaptable informal and formal teaching spaces are required. Emphasis will be on spaces and configurations that support critical thinking and project based learning ideally within groups of four students with the ability to break out of formal learning environments. Utilizing a push-in and team teaching approach, special education students will learn in the same collaborative learning environment as their peers.

d. *Architectural and Construction Quality.* ACPS has a strong belief that high-quality architecture has a positive influence on student success and faculty retention and is committed to delivering high-quality, state-of-the-art, and sustainable facilities to students, faculty, and the community. This belief applies to both external and internal qualities of the facility. The school facility and grounds are considered a learning tool and creativity in design and architecture is a priority.

Quality of design and engineering should focus attention on areas that most impact the learning environment with a particular emphasis on incorporating researched-based facility elements, such as enhanced natural lighting, acoustics, air quality, climate control and technology, that directly impact student achievement and educator effectiveness. Externally, the architecture must be respectful of the historical and cultural context of the community while simultaneously inspiring students and the public.

Materials and system selections should consider extended life cycles. Building systems, materials, and finishes must be resilient, easy to maintain, and create a positive, aesthetically pleasing learning environment. Life cycle of materials should balance quality and

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potential for future costs in an effort to ensure appropriate use of public funds is achieved.

The complete Elementary and Middle School Educational Specifications, including further information on planning concepts, design principals, and spaces can be found in the appendix of this document.

II. NATIONAL TRENDS IN EDUCATIONAL FACILITY PLANNING

A. 21ST CENTURY LEARNERS

Learning environments should be planned and designed with all learners in mind including auditory, tactual, kinesthetic, and visual.

Individual learning styles impact the way in which individual students:

- Concentrate in one's immediate surroundings
- Process information
- Make decisions and solve problems
- Complete tasks and assignments
- Interact with others
- Retain new information

Today's learners are technologically savvy and are accustomed to having information at their disposal. Today, learning occurs any time, any place, any path, and at any pace. Classrooms are transitioning from environments focused on teacher-directed whole-group instruction to learner-centered workplaces that support a collaborative culture of students at work.

While schools and homes continue to be important places for learning and with the knowledge and understanding that students also learn in ways not bounded by classroom walls nor the schedule of the school day, these "other" areas of learning become a critical component in planning and designing innovative, inspirational, and thriving educational environments.

B. STUDENT FOCUS GROUP

The Planning Team held a focus group with students from George Washington Middle School to discuss current and future learning environments and help inform the plan. The prevailing theme centered on students wanting the opportunity to have choices for how and when they learn throughout each class period, as well as throughout the day. They generally understood that each student has a unique style of learning and recognized the importance of providing appropriate environments and opportunities for each learning style.

Additional student discussion points captured generally accepted evidence based design elements as well as other trends in modern educational environments including:

- Exciting, engaging and varying learning spaces
- Access to natural daylight and climate control
- Ability to control acoustics and ambient noise
- Furniture options, adaptability, convertibility, and ergonomics
- Ability to work alone and/or in groups
- Space to move around and work within classrooms
- Informal break out spaces within corridors
- Healthy eating options and improved dining facilities
- Use of the media center for multiple activities (quiet and noisy)
- Access to deliberate outdoor learning spaces
- After school access to spaces such as the Media Center and fitness spaces

C. CLASSROOMS & TECHNOLOGY

The "classroom of the future" should be more personalized, student-directed, collaborative, interdisciplinary, and hands-on than those of even 10 years ago. As the focus of education moves away from the transmitting of information to developing creative problem solving and communication skills, the classroom setting is morphing into a beehive of activity – a learning studio.

At different times, students work alone, in pairs, or in groups:

- Working alone - reading, writing, interacting with the computer, or just thinking.
- Working together in pairs or groups - dissecting problems or reading and reacting to one another's written work, role-playing, or sharing ideas, opinions, and experiences.
- Interacting with the teacher and the whole class - listening, making presentations, asking questions or brainstorming ideas.

In addition, teaching methods address a variety of learning styles. Children with disabilities are educated

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alongside their non-disabled peers in their neighborhood school.

The classroom of the future should no longer be one-directional with rows of desks facing the front of the room. There should be a variety of focal points with mobile resources to support learning, flexible furniture, and robust technology. Rooms should range in size and purpose from small incubator and assessment spaces to large seminar and presentation areas. Corridors and informal learning spaces should create a seamless and extended learning environment. Technology is infused seamlessly into the education program and physical building. Wireless connectivity allows for learning - to occur at all times.

D. Media Centers and Student Commons

The 21st Century school media centers are changing from the quiet book-lined storage spaces for research and reading to multi-media, interactive studios of social collaboration for faculty and students. They are seen as a learning commons—an extension of the classroom that serve as the social and technological heart of the school.

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New media centers are more than 50 percent digital and offer both learning and gathering spaces as well as production areas. The ideal media center may move from noisy to quiet - through a café and mobile computing environment, to small, AV-enhanced, group study conference areas, to individual study carrels or a media production room that allows students to communicate and learn via various aspects of today's multi-media technology.

Multi-media technology is what this generation of students understands and uses. They communicate and learn through on-line devices, but also publish and perform. The media center may include a computer lab for research, a publications room for the school newspaper and yearbook, a video production and editing lab for film, a distance learning lab, and a variety of display venues.

National standards for media centers call for 4-6 square feet per student. Even at this size, most learning commons cannot offer a full range of media options. Multimedia satellites instead are infused throughout the school, complementing core curricular activities. Many learning commons also offer virtual space with internet, bringing together a generation that grew up on social media.

E. Building & Site

The school building itself is considered a learning tool and community asset. There is a sense of identity and the quality of architecture instills a sense of place and pride. The architecture considers learning opportunities over the entire campus, including school grounds and landscaping.

Transparency of spaces also helps foster an internal sense of community and excitement about the learning activities that are occurring within. Use of glass allows for visual connections externally and internally. Front entrances are inviting and welcoming for all community member – parents, families, and neighbors. The school is a hub of activity before and after school. Health services and other non-educational support are often provided.

In addition, ACPS decisions regarding buildings and grounds should consider recommendations from The City with regard to open space on school sites—including a goal of no net loss of usable open space. A more detailed discussion of open space guidelines is presented within "Section IV.A.p. Sites" later in this document.

F. Evidence-Based Environmental Elements

Evidenced-based design is the consideration of credible research findings in the planning and design process with a goal of achieving positive outcomes. Researchers have presented findings that link measurable outcomes such as student attendance, academic performance, faculty retention, and disciplinary actions. More specifically, the following four design elements have been connected to these outcomes: lighting quality, indoor air quality, acoustics, and furniture design.

a. Lighting Quality. The Heschong Mahone Group found statistical correlations between the amount of daylight in an elementary school classroom and the performance of students on standardized math and reading tests in 1999. ***Goal:*** *Improve natural and artificial lighting in classrooms*.

b. Environmental / Air Quality. According to the US Center for Disease Control and Prevention, American children miss approximately fourteen million school days each year due to asthma. Controlling environmental factors such as dust, pollen, and carbon monoxide could help prevent more than 65 percent of asthma cases of elementary school-age students according to the American Journal of Respiratory and Critical Care Medicine. ***Goal:*** *To ensure comfortable*

rooms, address temperature control, ventilation, air filtration, carbon dioxide levels, and HVAC background noise.

c. Acoustics. Research links the importance of maintaining appropriate acoustic conditions for student learning. This relates to noise from external sources and reverberation in the classroom and is linked to academic achievement, behavior, attention, and academic concentration. Acoustics are also important for teacher wellness and avoiding straining vocal cords while attempting to speak over noise. Classroom design parameters are generally accepted as outlined. ***Goal:*** *Limiting reverberation and background noise and improving sound isolation.*

d. Ergonomics. A 2007 study compared adjustable furniture in schools to traditional fixed furniture. Students using adjustable furniture were found to have higher grades than those in the control group using traditional school furniture. Characteristics of furniture that promote good posture should be considered as well as adjustable desks and chairs to allow students of varying sizes and body types to improve their comfort levels when sitting for long periods of time. Research studies continue to explore this issue. ***Goal:*** *Continue research exploring adjustable furniture to ensure comfortable experiences for students that enhance their learning.*

In summary, these national trends provide an important context for many of the ideas that ACPS is working to implement and how those concepts are articulated within this document.

III. ACPS LEARNING AND TEACHING MODEL

Learning and teaching in ACPS is a well-executed balance between a rigorous curriculum, proven instructional strategies (pedagogy) and relationships with students that communicate high expectations and commitment to student success.

ACPS developed and uses a 21st century curriculum focused on helping students become critical thinkers and problem solvers. In addition to helping students acquire declarative and procedural knowledge, each unit has a focus on higher-order thinking skills to ensure students are developing critical thinking skills needed for post-secondary success: reading complex text, writing at a post-secondary level, analyzing and interpreting data and participating in discourse across the disciplines.

A. Instructional Methods

Instructional methods vary with grade level, but maintain continuity from early childhood through the primary, intermediate, and middle grades. Predominant elements include:

- Integrated learning, where content areas cross disciplines
- Flexible groupings (In primary grades, regrouping stays within the classroom).
- Mentoring of older to younger students
- Extended day learning opportunities
- Parent involvement and volunteer activities

ACPS offers 'What to Expect' brochures for every grade level available on its web site and the full program of studies is available for middle and high school. These documents should be referenced by architects to better understand program offerings and curriculum goals.

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IV. PLANNING CONCEPTS

The following section provides executive summary level descriptions of the capacity analysis and planning concepts of each program space within an ACPS school facility.

Every school project begins with establishing the number of students that will be served when the project is complete or the "capacity". Capacity is the primary driver in determining the number, type, and size of the spaces in the new or modernized building.

While there is no ideal school size, schools in ACPS range from ~350 students to ~900 students at the elementary level and typically between ~1100 and ~1300 at the middle level. Additionally, the middle school's Ed Spec is based on a capacity of 1200 students due to the current and projected sizes of the middle schools. Ideally, elementary capacities would range between 450 students and 800 students, and this prototype is based on 700 students for illustration only. Nationally, the average school size is 600 (540 in Virginia) with smaller schools in urban cores.

The Division has been provided with an active, editable spreadsheet that allows planners and architects to develop facilities lists for a range of schools based on the capacity and unique program needs in real time.

Simply defined, school capacity is a product of the number of classrooms at a school and the student stations assigned to each room type. Only classrooms that are 600 square feet or more with a teacher and students regularly assigned to the space are counted toward full time capacity. For elementary schools, small instructional spaces and specialized labs including art, music, or resource are not part of the capacity calculation. It is possible for a school's capacity to change from year to year based on average class sizes (determined by the budget) or changes in the number and type of programs.

By applying actual school staffing to enrollment, it can be determined that for most ACPS elementary schools, class sizes will range from 20 to 24 in grades kindergarten through 5th grade, while middle school ranges fall between 20 students for core classes to 25 students in the encore (art, vocal music, library, and physical education) classes.

Currently, for elementary grades, ACPS budgeted class size caps range from 22 in kindergarten to 26 in 5th grade, but the average class size in ACPS is lower. The classroom size limits enunciated by the ACPS School Board are generally in line with the regional averages and in keeping with the division's long range policies and goals. It is important to size all classrooms to accommodate the maximum number of students even if the average is used for capacity planning.

At the middle school level, ACPS has become more concerned about the size of these schools. All middle school buildings function in a grade level multi-team environment. In this setting, teams of teachers (English, Social Studies, Math, and Science) together teach the same group of students (100-110). The team usually has the same planning period so they can collaborate and create and interdisciplinary curriculum customized to their students' needs. This strategy makes it difficult to "float" teachers. However, since teachers usually teach 5 out of 7 periods, the overall utilization of the building in any given period is 71-80%. For this Ed Spec, maximum capacity will be factored at 80% utilization.

Once a capacity is proposed, many other areas of the building are sized to support the enrollment. The number of small group rooms, art and music labs, and support staff offices are based on staffing formulas. The size of the core areas such as media center, dining and food services, physical education facilities, and site amenities are based on local and national benchmarks related to size.

The following charts (figure xx) summarize the breakdown of the proposed capacity for both a prototype 700 student elementary school and prototype 1200 student middle school.

Per the Guidelines for School Facilities in Virginia's Public School, the goal of the optional guidelines developed by the Virginia Department of Education is

"… to provide recommendations that will help local school divisions ensure that their school sites and facilities support the principles of good teaching and learning and promote sound educational programs."

The guidelines developed here by the project team respond to or exceed Virginia State guidelines and recommendations.

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A. Program Area Summaries

The following section provides executive level narrative summaries of the core program space areas.

Supporting figures for each individual item listed below can be found in the appendix of this document.

a. *Main Office-Reception, Administration, and Student Services.* As students, families and other visitors enter an ACPS building, it is important that they are greeted with an inviting and well organized front office suite.

Elementary schools should also have their main offices located at the primary entrance. The architect should consider security when designing the main spaces while office space should be organized to provide direct visual access to the entrance doors. Architects should also provide appropriately sized office spaces with an adjoining shared conference room and adjacent staff restroom. Occupational and Physical Therapy services as provided by ACPS, consist of staff traveling between multiple school locations. Within the main office, provide an appropriately sized space that includes itinerant work stations and storage. Near or adjoining the main office, provide the Family and Community Engagement center. Other administrative functions can

be dispersed throughout the school via grade level suites to encourage maximum student collaboration and connection.

For middle schools, the primary administrative office, guidance services, and adult restrooms should be located in a centralized area near the main entrance to the school. A digital kiosk in the lobby may provide real-time information on school's administrative and building operations.

Visitor parking should be located by the front door. Signage and building design should clearly indicate the school entrance. Immediately upon entry, visitors should be directed to the Welcome Center/main office. For security reasons, no visitor should be able to enter the classroom areas without being checked through the reception area.

b. *Health Services.* Health Services should be located near the main entrance to the school. Health Services is responsible for providing health related amenities to all students and staff. The space should be organized to provide appropriate space for:

- health screenings
- illness or injury treatment
- meetings and trainings
- prescription medication storage and distribution
- secure records keeping
- private consultations
- rest and recovery units
- waiting area

In addition, it is possible that a facility in the future will provide (location dependent) community partner/provider operated wellness centers. These centers will require additional spaces accommodating such amenities such as:

- full medical evaluations
- full laboratory services
- dental services
- radiology services
- pharmaceutical services

Cooperative and collaborative wellness centers are desired (location dependent) and operated through community partnerships.

If the school division elects to provide a school based health center (SBHC), the architect should work with officials to ensure full space programming requirements are met according to federal regulatory standards. This center should be adjacent to the school clinic but implementation of a full SBHC will require significant advance coordination by ACPS.

c. *Core Instructional Spaces.* The basic organizational structure of the school should reflect a cluster concept and should consist of general purpose classrooms, commons space for informal instruction, a small group room, two and three dimensional display areas, and a teacher work center. Each cluster should also contain a resource classroom used by support educators and an extended learning area to facilitate collaborative teaching and learning. At the elementary level, student restrooms should be located within all classrooms or shared by two adjoining classrooms.

d. *Classrooms* Elementary and middle school classrooms should utilize flexible, easy to arrange and store furniture. Student arrangements should reflect small collaborative groupings over individual desk arrangements. Many elementary classrooms are designed around discovery-based learning centers. Provide 'teaching and learning' surfaces on two walls to include touch screen interactive boards, magnetic white boards and tackable surfaces at student height. The provision of an itinerant or hoteling space for drop-in or special needs instructors is a unique feature that should be included in each classroom. Restrooms should adjoin classrooms at every grade level to increase flexibility for conversion to younger grades if necessary. Each classroom should include a sink and a water bubbler.

Extended learning areas (ELA) should be incorporated into designs as additional teaching spaces learning areas that occur adjacent to each academic cluster. ELA's are open spaces off the corridor that are meant to facilitate break out instruction, small group and project-based work in addition to multi-class collaboration and joint teaching initiatives. ELA's vary in size based upon the individual needs of the school and the academic cluster and should be designed and equipped to accommodate a variety of furniture arrangements to optimize flexibility.

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e. Science. Each elementary-level classroom should be designed to support science activities and simple lab components. Schools should supplement the in-classroom sinks by providing a portable science demonstration cart for each academic cluster. Additionally the provision of an outdoor classroom, a garden area, and/or a food lab should also be considered in order to support elementary level science instruction. If a food lab is provided, it should be located off the main dining area and equipped as a dual purpose warming and cooking studio for both teaching and extracurricular activity support.

Middle school science classroom should be designed to support combined science lectures and hands-on lab activities. Integrate technology to support wireless one-to-one device connectivity and Bluetooth precision measurement device connectivity. Science classrooms should be integrated into the grade-level academic clusters. Additionally, the provision of an outdoor classroom, a garden area, bio-retention pond, greenhouse, water collection observatory, and/or a food lab should also be considered in order to support science instruction.

f. Career Technical Education. At middle school, space should be provided for: (1) Business, (2) Family & Consumer Sciences (FACS), and (3) Technology programs. FACS courses require access to kitchen studios while business courses require a standard flexible classroom. Technology course space requires a dedicated multipurpose technology lab that allows for flexibility to shift from between various course topics supported with portable furniture and equipment. Programs taught at the middle school level build foundations for more specialized high school program offerings.

g. Special Education. Special education facilities should be integrated throughout the school to support the concepts of inclusion and the specialized requirements for the students. Currently, more than 70 percent of all students with disabilities are included in standard learning environments for 80 percent of each day. In all schools, provide at least one resource space for every two grades or at least three spaces per school to support individualized learning needs and/or speech therapy. Typical occupancy of a pullout space is approximately four to five people. A dedicated, programmatically-sized classroom may be necessary on a location-by-location basis to support City-wide programs and would be identified at the time of individual site planning. Special education facilities should be integrated throughout the school to support the concepts of inclusion. Special attention should be given to accessibility of all facilities and an integrated learning program.

h. English Language Learning (ELL). ELL instruction occurs at every elementary school in the division but enrollment can vary from as little as five percent of the school's total student population to over 50 percent. The majority of ELL instruction is pushed-in to the general education classrooms with an itinerant instructor floating into classes as needed. Elementary schools also provide an English Language Development (ELD) break out class which can typically be accommodated in one of the resource classrooms; however, in schools with a large ELL population, such as Ramsey ES, it is possible that a dedicated classroom will be required.

Middle schools also provide English for Academic Purposes (EAP) break out classes to help students with specific needs. These break-out classes can typically be accommodated in the larger resource classrooms. It should be noted that beginning in the 2015 school year a new International Academy program, modeled after that which exists at T.C. Williams, will be implemented at Hammond MS. Designers should be careful to inquire about the site-specific requirements.

i. Talented and Gifted (TAG). A TAG program exists at every school in the division, although enrollment varies widely from school to school. At the elementary level, staffing levels are based upon enrollment but at most schools there is one full time TAG teacher. For grades K – 3, TAG curriculum is 'pushed in' to the standard classrooms and is managed by the elementary teachers. At the 4th and 5th grade levels the same strategy is utilized for social studies and science curriculum; however, mathematics and language arts TAG course work is 'pulled out' into a separate classroom. Typical class size for these TAG classes is about 15-20 students, warranting the provision of an assigned, standard classroom. Additionally, TAG curriculum emphasizes project-based learning which may occasionally require use of

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ELA space or resource rooms along with the provision of storage for student projects. At the middle school level, honors (TAG) classes are taught by the subject area teachers as part of their normal daily schedule and student enrollment varies from 10 to 20 percent of the total student population. Therefore, separate, individual TAG classrooms are not necessary. The TAG program does, however, include a TAG resource teacher who provides curriculum guidance and instructional support to the individual subject area teachers. The TAG resource teacher may 'float' from class to class occasionally requiring the use of itinerant desk space in the classroom and, because of the emphasis on project-based learning, the TAG resource teacher may occasionally work with a small group of students in an ELA space or a resource room.

j. Early Childhood. ACPS does not currently provide universal pre-kindergarten programs and, at some schools, early childhood education is provided either through a state funded grant (Virginia Preschool Initiative) or federally funded grant such as Head Start (provided by a community partner, The Campagna Center). In accordance with national trends toward earlier schooling, ACPS desires to implement universal prekindergarten at every school. For planning purposes, this document allocates classrooms for early childhood at every school at 80 to 90 percent of the planned kindergarten classrooms. At schools that house Head Start, classes can be held in standard PreK/K classrooms described in this document.

k. Advancement Via Individual Determination (AVID). AVID is an elective course that targets students in the academic middle who have a desire to attend college. Enrollment in AVID varies year to year and from school to school but approximately 10 to 15 percent middle school students currently take the course, which amounts to about 25-30 students per class period throughout the school day. The AVID academic week includes two days of traditional classroom-based instruction, two days of small group tutoring, and one day of team building activities or guest speakers.

Accommodating all of these activities in one space requires a larger than average classroom that can be partitioned into two smaller rooms to minimize noise and maximize available whiteboard space during tutoring sessions. On tutoring days the class is divided into four smaller groups at a ratio of about seven students to one tutor. Several small tables should be utilized to maximize flexibility and all furniture should be on casters due to daily rearrangement. It is suggested that a small adjacent room be added to accommodate hoteling space for tutors and storage for student work files. The AVID room should be placed in a centralized location at an equitable distance to all grade levels, with a suggested adjacency to the media center.

l. Visual and Performing Arts. ACPS has a strong arts focus in the elementary and middle grades. Well-designed spaces need to support a vigorous curriculum and creative presentations. Art, music, and multi-purpose classrooms should be shared by all grade levels for general class and small group instruction. The location and access to these rooms should promote orderly transitions.

Larger ACPS elementary schools often have more than one art teacher (but less than two). The main art instructor assigned to the school will own the main art classroom and ancillary spaces. Optimal location for the art room is on the ground floor with a northern day lighting orientation. Access to an outside patio or seating area should offer additional work space, display spaces, and performance spaces. Itinerant art instructor assigned to the school will function out of the Early Childhood Dining/ELA space where a separate art storage location is provided. This location provides the opportunity for push-in art assembly or the ability to program the adjacent ELA as a full-size classroom when needed.

Additionally, larger elementary schools also often have one music teacher each for choral, band and orchestra – not all full time. Large practice and performance spaces are not provided for part-time programs and so the stage may be used part of the day for practice for orchestra or one of the other classes. If possible the music suite should be located near the stage and instrument storage shared between the band and orchestra. Chair and music stand storage can be provided on or under the stage.

For middle school, art rooms should support 2D and 3D instruction. The optimal location for the art room is on the ground floor with a northern day lighting

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orientation. Access to an outside patio or seating area will offer additional work space, display spaces, and performance spaces. Display areas in the corridor should allow for 2D and 3D projects.

A multi-purpose performance venue (auditorium), at the middle school level, will also act as a drama classroom (stage), a practice room, a large group gathering space, and a community meeting space. The room should have a flat floor with flexible seating options and may have telescoping seating for some portion of the room. Appropriate acoustics, sound and lighting systems are critical to the room's flexibility and functionality. If possible, the music suite should be located near the auditorium. Locate dedicated small group practice rooms within the music suite along with storage areas.

m. Media Center. The media center serves a dual role – its traditional role as a gathering place for research and learning and a new role as a technological information base and learning hub. In this new role, the media center may house a wireless voice/video/data network, which runs throughout the entire building. This network enables the transmission of media services to the desktops of teachers and students without physically entering the media center. The new library will utilize digital technology to enhance voice, video, and data communications within the school, among division facilities, and with distant learning resources.

n. Physical Education. To support the elementary and middle school physical education program, a variety of indoor and outdoor areas are required. Outdoor physical education teaching areas should be located near the indoor gymnasium. Physical education facilities should be designed with a focus on community use during non-school hours, since there is a high demand for both indoor and outdoor facilities.

ACPS offers formal physical education to elementary students twice a week. For larger schools this may mean 2-4 teachers are teaching in the gymnasium at the same time. At a safe 100 square feet per student, larger schools need a full size gymnasium to accommodate the program. Because the elementary schools do not have intramural sports, no seating is required. To further support the physical education program and provide for after school programs, larger schools should have a smaller multi-purpose space.

ACPS offers formal physical education to middle school students daily on a rotating quarterly schedule. Intramural sports are offered each season and utilize both indoor and outdoor space. Fixed seating requirements should seat the entire school enrollment in bleachers. To further support the physical education program and provide for after school programs, larger schools should have a smaller multi-purpose space and a full locker room with individual showers.

Parking should be located near the gymnasium and a separate entrance should be provided for after school activities. Flexibility of space use is desired and designers should provide the ability to separate the gymnasium into two smaller gym stations during teaching periods.

o. Dining and Food Service. The dining space(s) should accommodate one-third of the projected student capacity each lunch period. The dining area(s) should be warm and inviting spaces with plenty of natural light, pleasant acoustics, and multiple seating choices. The furniture should be age appropriate and serving lines height sensitive which may require having two distinct areas for primary and intermediate students. It is proposed through creative design that dining area(s) should effectively house multiple functions including assemblies, community meetings, and potentially be utilized as learning areas.

For elementary schools, this educational specification recommends providing for two separate dining areas: one for the early childhood grades (PreK and K) and one for grades one through five. The early childhood dining area should be located adjacent to the classrooms where it can also function as the ELA and an indoor play area in a fashion similar to the distributed dining concept. The dining area for grades one through five should be much larger and designed as a more traditional centralized cafeteria adjacent to the kitchen. The space should also include the school stage for performances. The key to a well-designed multi-purpose performance space is to consider the technology, acoustics, and layout very early in the design process. The architect should consider the room volume, configuration, technology requirements, acoustics, and general layout as it relates to the stage

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and kitchen. These key design points can then be further enhanced by the selection of materials and a well-designed audio system.

For middle school students, this educational specification recommends a more traditional, centralized dining space adjacent to the kitchen. This space will serve multiple functions and will also include a stage to host school performances. The architect should consider the room volume, configuration, technology requirements, acoustics, and general layout as it relates to the stage and kitchen. These key design points can then be further enhanced by the selection of materials and a well-designed audio system.

Food service is responsible for food preparation and delivery of food programs division wide. Food services facilities should provide appropriate space for both 'scratch' and 'warming' kitchens with appropriate equipment. Provide appropriate sized storage facilities to support healthy eating program offerings which include; breakfast, bag meals, meals between bells, snacks, lunch, and supper.

Architects should consider serving and dining areas that incorporate composting and recycling facilities, homelike environmental qualities, breadth of flexible seating options, and design qualities that support visual and verbal communication between students and faculty.

p. Site. Site circulation should be organized for safety and efficiency. This should be accomplished through careful separation of vehicular traffic, including the separation of school buses, parents, and staff. Particular consideration should be given to providing safe passage to pedestrian traffic. Sufficient stacking space should be provided to prevent congestion of busy streets.

All play areas should be protected from vehicular and pedestrian traffic, so students can be assured of a safe and secure environment on the entire school site. Shading elements should be considered along with an outdoor learning area and garden.

The Virginia Department of Education Guidelines recommend that each school "site have areas that can be developed to provide the minimum number of play areas require for physical education."

Alexandria school sites are urban in nature and most current and future sites cannot accommodate the recommendations outlined in the Guidelines for School Facilities in Virginia's Public School. However, every elementary school site should accommodate non-structured or natural play areas as well as at least one playground. It is recommended that architects work

CASE STUDY: Bailey's Upper Elementary School for the Arts & Sciences / 6245 Leesburg Pike, Falls Church, Virginia

This school for grades 3-5 is the first mid-rise elementary school in Fairfax County. Fairfax County Public Schools purchased the vacant, five story office building in December 2013 and retrofitted it to a school in time for a September, 2014 opening. Approximately 600 students attended the school in 2014.

The school is located in the Seven Corners Area, 1.6 miles from Bailey's Lower Elementary School for the Arts & Sciences, which houses grades pre-K-2.

The center of the L-shaped building is the "main circulation spine," with a large stairwell. The common rooms are located close to the center, with the classrooms on the far ends of the building. Some uses such as small auditorium spaces and the media center span two floors and provide their own separate connections between floors. There are three or four classrooms per floor, organized into learning communities and connected by new stairways to classrooms above or below. All of the classrooms have exterior windows. About half the classrooms have bathrooms, while the other bathrooms are near the elevators. Students do not use the elevators on a regular basis; the elevators are primarily used by students and staff with disabilities.

The school also has a black box theater, a story pit in the library, a cafeteria with small tables giving it a café feel, science labs, a TV studio and art rooms.

Three wood-floored rooms with padded walls provide indoor space for physical-education class. The school does not have a playground. A second construction phase could add a playspace in what is now an asphalt parking lot, and possibly an enclosed field house.

The entrance was moved to the back of the building to meet ADA accessibility requirements and to better accommodate a bus dropoff and kiss and ride area.

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with ACPS and RPCA to prioritize types of outdoor space development on a site-specific basis. Architects should endeavor to design new schools or future renovations in a way that will maximize available open space. Ideally, all elementary schools will be designed to accommodate one multiuse field play area that conforms to the state guidelines.

q. Site Management. Recreation, Parks, and Cultural Activities (RPCA) is a partnership program that utilizes shared ACPS facilities for afterschool programming. RPCA operates the majority of playing fields, courts, parks, and playgrounds adjacent to Alexandria schools. When funds are available to enhance the campus or grounds of the school, architects should coordinate and consider RCPA's requirements towards playgrounds, courts, fields, and gymnasium spaces, per the joint ACPS/RPCA Facility & Outdoor Maintenance & Use agreement.

r. Parking and Transportation. ACPS recommends the minimum parking requirements based upon proposed capacity prototype. Actual parking requirements may be impacted by factors such as zoning, site constraints, absences or presence of other modes of transportation, etc. The architect must coordinate at time of design and it should be noted that ACPS offers incentives to encourage carpooling and the use of mass transit by staff.

V. DESIGN PRINCIPLES

The following section provides executive summaries of the guiding design principles that should be applied to each space within an ACPS school facility. The appendix of this document includes expanded detailed guidance for some of the categories discussed here.

URBAN SCHOOL MODELS: As Alexandria becomes more urban, there are fewer vacant sites or sites developed at a low intensity that could potentially be used for school sites. In this changing environment, the City and ACPS are exploring urban school models. For purposes of this plan, urban school means a smaller school site than is the norm in Alexandria with a school building that is taller (3+ stories) than the norm in Alexandria. While an urban school can often serve as the center of a community through the co-location of other uses, such as a library, recreation facilities or senior center, such co-locations can occur on traditional school sites as well; co-location is examined in further detail in applicable sections of this document.

An urban school can also include completely separate uses within the same building. A school might occupy the first few floors of a building with offices or residences above, or a school might occupy a separate wing of a mixed use building. A school which included preschool or elementary grades would need to be on the lowest occupiable floors, with consideration given to having the youngest students on the ground floor. In a mixed-use building, the portion devoted to the school would need its own entrances, and would likely require separate elevators and stairwells for security purposes. Separate alarms and HVAC systems would also be required.

The Educational Specifications that are part of this plan were developed with a traditional school in mind. With an urban school model, most of the specifications would remain the same. Given the limited size of an urban school site, however, some of the Educational Specifications might need to be provided in a non-traditional manner. Nearby community and private facilities could in certain circumstances be used to meet the specifications. Providing play space in an adjacent park is one case in point.

The table on the right lists Elementary and Middle School Educational Specifications that might be accommodated in a non-traditional manner in an urban school. In all cases, any nearby spaces or facilities would need to be within ¼ mile walking distance and the walk would need to be on a safe, continuous sidewalk or trail, through open space or along a roadway categorized as a primary collector, residential collector or local street. Students would not be allowed to cross or walk along Controlled Access Facilities/Expressways[1] such as I-395 or Arterials such as Duke Street, King Street or Route 1.

Specification	Potential Alternate Provision
Gymnasium	- Less than full size - Use of nearby public/private gym
Auditorium	- Use of nearby theater/ performance space
Cafeteria	- Distributed eating throughout school - Lunch in classrooms - Use of private catering company - Use of nearby restaurant/ cafeteria
Media Center	- Use of nearby library - Mobile library - Media satellites throughout school
Art	- Mobile art lab
Administrative Offices	- Distributed throughout school
Health Services	- Use of nearby public health clinic - Partnership with a nearby private clinic (ex. Minute Clinic) - Mobile health unit
Early childhood (Pre-K)	- Located in a nearby facility
Aftercare	- Located in a nearby facility
Outdoor play space (hard and soft surface)	- Rooftop - Use of nearby facility (must be fenced)
Bus	- Bus drop-off location required - Use of BRT lanes for school buses
Kiss and Ride	- Dedicated on-street parking spaces
Parking	- Less parking if near Metrorail or Metroway (Bus Rapid Transit) - Use of shared parking

*NOTES: **(1)** Street classifications may change as a result of the update to the Pedestrian and Bicycle Master Plan and the development of Complete Streets Design Guidelines. The intent though would still be to keep children away from high capacity roads.*

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OPEN SPACE GOALS & GUIDELINES

1. The City recommends establishing policies on zoning with regard to open space on school sites, including a goal of no net loss of usable open space. The 2002 Open Space Master Plan Goal #7 calls to "maximize use of public school open space areas." This is an important goal as the City is increasingly dense and school sites provide some of the largest open spaces on public land in Alexandria. The open space at school sites contributes to the performance measure the City has to maintain of 7.3 acres of open space per 1,000 residents. A loss of open space on existing school sites would reverse the efforts to maintain this ratio. In order to preserve this open space, the City recommends:

Existing schools sites renovations:

- School sites shall avoid any net loss of open space on the property and seek to improve the quality of the open space on existing sites.
- If open space is zoned Public Open Space (POS) it cannot be built on. However, if the building renovation or addition is best situated on existing POS then there must be a rezoning that results in the equivalent amount of new POS elsewhere on the site for recreation or natural area purposes—ensuring that the City does not lose open space acreage (as occurred with the Jefferson Houston School redevelopment project).

New schools sites:

- Given the densification and urbanization of the City, there will be a need to design and build for "urban model" facilities to accommodate enrollment projections. As with many urban schools in other jurisdictions, there may not be opportunity to incorporate, on-site, the outdoor recreational and nature area spaces suggested in the educational specifications.
- However, it is developmentally important for students to recreate, have access to explore nature, and learn in an outdoor classroom, as advocated in many recent initiatives including the First Lady's Let's Move campaign, the City of Alexandria Eco-City Charter (2008), and the Partnership for Healthier Alexandria's Playspace Policy (2013).
- In order to provide recreational and outdoor spaces for new urban schools, the City recommends the following three strategies:
  A. Build multi-story schools to maximize the availability of outdoor space on the site
  B. Explore creative options for urban recreational space, such as rooftop courts or partnerships with private gyms
  C. If no open space is available on site, ensure that the school is located within 0.25 miles (a child's walking distance) of an existing park that has safe access and connections. The Park shall be able to accommodate outdoor educational classes and be enhanced, as necessary, to manage increased use.

2. Meet the Guidelines for School Facilities in Virginia's Public Schools (2010) standards for school sites, including the acreage of outdoor play area space per pupil. Recent studies have shown that ensuring access to play, whether active recreation or exploration in nature, have positive impacts on both physical and mental health. The Summary of Facility Space Requirements on page 39 in the Educational Specifications (see appendix) provides guidance of recreational play space, per the Guidelines for School Facilities in Virginia's Public Schools. Including these standards in any school site project ensures that students receive the benefit of recreational opportunities. The State guidelines do not include specific size per pupil standards for natural areas, however, the City encourages opportunities to connect children to nature. Moreover, the 2013 Parks and Recreation Needs Assessment showed that 67% of Alexandria residents have a need for natural areas and 81% have a need for walking trails, furthering the desire to incorporate accessible nature into school sites that are open to the public after school hours and for after school activities.

3. Where a full sized field can physically fit, meet the requirements of the National Federation of State High Schools Standards for athletic fields. ACPS school sites provide some of the largest recreational areas in the City and the best locations for full sized fields that meet the requirements of the National Federation of State High School Standards. Through the RPCA and ACPS shared use agreement, ACPS gives RPCA the priority to use their facilities, including sports fields, one hour after school lets out each day. Each school community is unique and designers should consider what spaces best support the community's needs, however, ACPS and the City should plan and design school sites to support community use during these non-school hours. A full sized field at a school not only benefits the school time use of the field for students, but also the City-wide community of children and adults that play sports thoroughout.

4. Maximize community use and recreation program space and delineate clear access to public use spaces for students and community, as identified in the education specifications and the 2014 Facility & Outdoor Maintenance & Use Agreement. The 2014 Facility and Outdoor Maintenance and Use Agreement ("agreement") provides a structure for the broad and cost effective use and maintenance of all ACPS and city owned and operated facilities in spaces and provide maximum effective public benefit of all community facilities. School divisions and governmental agencies across the Country are beginning to realize that they need cooperation, especially considering the ever-shrinking budgets and meeting the diverse needs of the community. Planning for future schools should include joint use considerations at the beginning of, and throughout the process.

5. Maximize canopy coverage and fulfill the goals of the Urban Forestry Master Plan. The 2009 Urban Forestry Master Plan included specific recommendations for increasing tree canopy on school sites. Alexandria City Public School properties are perhaps the City's greatest untapped public resource for planting trees and adding to the City's tree canopy cover. Public school properties are important community green spaces and should be managed for the benefit of the neighborhoods in which they are located. In order to implement the Urban Forestry Master Plan, the City recommends that ACPS and the City inventory and then develops comprehensive management plans for all trees on public schools.

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A. Furniture & Equipment

Classrooms vary in shape and size; therefore, the furniture should be flexible to accommodate a variety of classroom formats for both individual and group activities. Teachers and students should have storage space for personal belongings, papers, books, supplies, and teaching materials.

To the extent possible, movable furnishings should be used, rather than fixed casework, to provide flexibility for future reconfiguration. Furniture should be selected for its ergonomic traits, with consideration for variability and adjustability to support diverse learning styles. In middle schools, architects should consider full height private lockers in hallways for every student.

B. Technology

The facility should contain the latest in technology and infrastructure should be provided to support wireless access to data and video throughout the building. It is intended that access to technology will be seamless and pervasive throughout the building with only the minimal number of hard drops needed to support voice, teaching stations, and wall-mounted devices. Technology infrastructure should support the concept that learning can happen anywhere by enabling a one-to-one student to device ratio and the notion of "bring your own device". The specific tools and design guidance will be determined based on the best practices at the time of construction.

Every learning area should be wired for teacher audio enhancement. Research into this cutting-edge technology suggests that student learning can improve in classrooms where the teacher's voice is amplified and the classroom acoustics are designed to support voice clarity.

C. Universal Design

The entire facility should be accessible for students, staff, and visitors. This should be accomplished through judicious use of ramping and elevators with sufficient internal clearances for circulation, convenient bus/van loading and unloading, and nearby handicapped parking spaces. All elements of the Americans with Disabilities Act must be complied with, including way finding and signage, appropriate use of textures, and universal accessibility of all indoor and outdoor school facilities.

D. Safety & Security

ACPS wants to maintain an inviting and de-institutionalized environment, while simultaneously providing a safe environment for students, staff, and community. The organization of a building will have a major impact on student behavior and safety concerns. Architects should refer to Crime Prevention Thru Design (CPTED).

All school locations should include a double perimeter approach where every visitor is guided through a secure exterior door into a secure holding vestibule prior to gaining access to the main office. Visual access from the main office to the exterior vestibule is mandatory and every entrance to the school should have a CCTV IP camera. Consult with ACPS over the most current keying policy.

E. Community Use and Partnerships

ACPS is pleased to have community and non-profit partners in its buildings offering valuable services and programs for students and families. Partnership programs and other regular community activities require shared, co-located and sometimes dedicated space that is internal to the school yet has the ability to operate beyond ACPS school hours. Extended hours of operation require the partnership programs and community activity area to have an entrance that can be separated from the main school. This allows partnership program to operate independently of the school's staffing requirements and provides the necessary security to protect the main school. This secondary building entrance for after school program use should be visible to all spaces co-located in the community use and partnership area, specifically the gym and multipurpose rooms. This space will be utilized by after school programs for record keeping, registration transactions, secure money storage, and child pickup. During general school hours, partnership programs should function under ACPS' security policies and use of secondary entrances should be restricted.

Program offerings are location dependent and include, but are not limited to:

- Tutoring
- Family and Community Education Centers (FACE)
- Recreation, Parks & Cultural Activities (RPCA)
- Medicaid Therapy
- Campagna Center

Functions of these programs should be co-located with the ability to utilize standard classrooms, the gymnasium, multipurpose room and media center. It is also important to note that licensed programs have specific requirements that should be considered as a part of any plans to renovate or build new facilities. While the requirements are not onerous, failure to incorporate their consideration during the planning process can significantly constrain having access to such programs.

ACPS has a standing partnership with Alexandria City's Department of Recreation, Parks, and Cultural Activities (RPCA) for the maintenance and after-school programming of fields. At several schools, RPCA operates after school and community programs in the gymnasium or multipurpose room; per the joint ACPS/RPCA Facility and Outdoor Maintenance and Use Agreement.

F. Family and Community Engagement Centers

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ACPS serves a diverse community of families who have immigrated to the DC Metropolitan area from all over the world. It is understandable that newcomers to the school may be hesitant to engage staff and need additional support. The Division wants to establish Family and Community Education Centers (FACE) at each school to welcome families and provide the additional resources to help them succeed.

A typical FACE center would ideally be located near the main office and include a reception area with comfortable seating for individual conversations, table seating for meetings and classes, private offices, and storage.

G. Parent Teacher Associations

Provide flexible use space to accommodate the mission and program offerings of the PTA group. PTA's meet on a monthly schedule, typically during the evening and have 30 to 35 participants in attendance. PTA meetings include School Board Members, parents, and, on occasion, the Superintendent. The PTA's offer volunteer after-school programs that require access to standard, flexible classrooms, the gymnasium, the media center, and the cafetorium. Consider co-locating PTA with other partnership functions like the FACE center. PTA functions require dedicated storage space and direct interaction with the school's main office suite and staff.

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H. Energy & Environmental Performance

ACPS is dedicated to renovating existing or building new facilities that meet or exceed the City of Alexandria Eco-City standards and LEED environmental performance standards. ACPS desires to offer schools that teach faculty, staff, students and the community the importance of environmental stewardship. ACPS believes quality architecture and high energy performance facilities positively impact the education of students and increase retention of staff and students. At this time, city development standards require compliance with LEED Silver certification standards for major construction projects.

I. Materials & Finishes

ACPS believes high-quality architectural materials and finishes create an atmosphere that supports and inspires learning. All spaces should be conducive to teaching and provide a warm and welcoming feeling and meet the principles of Evidence Based Design (lighting, environmental / air quality, and acoustics). All materials must be highly durable and resilient yet support a creative learning environment. ACPS is cognizant that materials should be reasonable in cost and not exuberant when considering budget and life-cycle costs to maintain and upkeep. Balance is necessary to maintaining budget and achieving ACPS' facility standards.

J. Operations & Mechanical

Provide mechanical systems that are climate appropriate and responsive to the life cycle, maintenance and efficiency expectations of ACPS. Provide passive systems that pair with active systems and coordinate to achieve maximum efficiencies while coordinating with the users to determine the location of universal and dedicated systems.

VI. ELEMENTARY AND MIDDLE SCHOOL PROTOTYPES

The careful organization of programmatic components during early design phases is critical for the success of a future school program.

A. The 700 student elementary school prototype

There are two academic clusters in the 700 student prototype. A single main entry is a specific determination of ACPS's security plan and that entrance is supported by administration and family and community engagement center functions. Academic clusters are located in the quiet areas of the building that can be isolated during off-hours. Noisier and shared programmatic clusters are grouped toward parking, public and play areas and allow for after-hours access. Informal "break-out" or Extended Learning Areas happen throughout the building.

The number and size of support spaces and labs are driven by staffing formulas and national benchmarks. For new schools or the modernization/addition to an existing school, this information would inform a 'site specific' educational specification

B. The 1200 student middle school prototype

There are three academic clusters in the 1200 student prototype. Academic clusters are positioned at the corners of a diamond-shaped plan with the fourth corner taken by the main entrance. A single main entry is a specific determination of ACPS's security plan and that entrance is

supported by administration and family and community engagement center functions. Academic clusters are located in the quiet areas of the building that can be isolated during off-hours. At the middle school level, each academic cluster includes a per grade administrative suite. Noisier and shared programmatic clusters are grouped toward parking, public and play areas and allow for after-hours access. Informal "break-out" or Extended Learning Areas happen throughout the building.

The number and size of support spaces and labs are driven by staffing formulas and national benchmarks. For new schools or the modernization/addition to an existing school, this information would inform a 'site specific' educational specification.

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