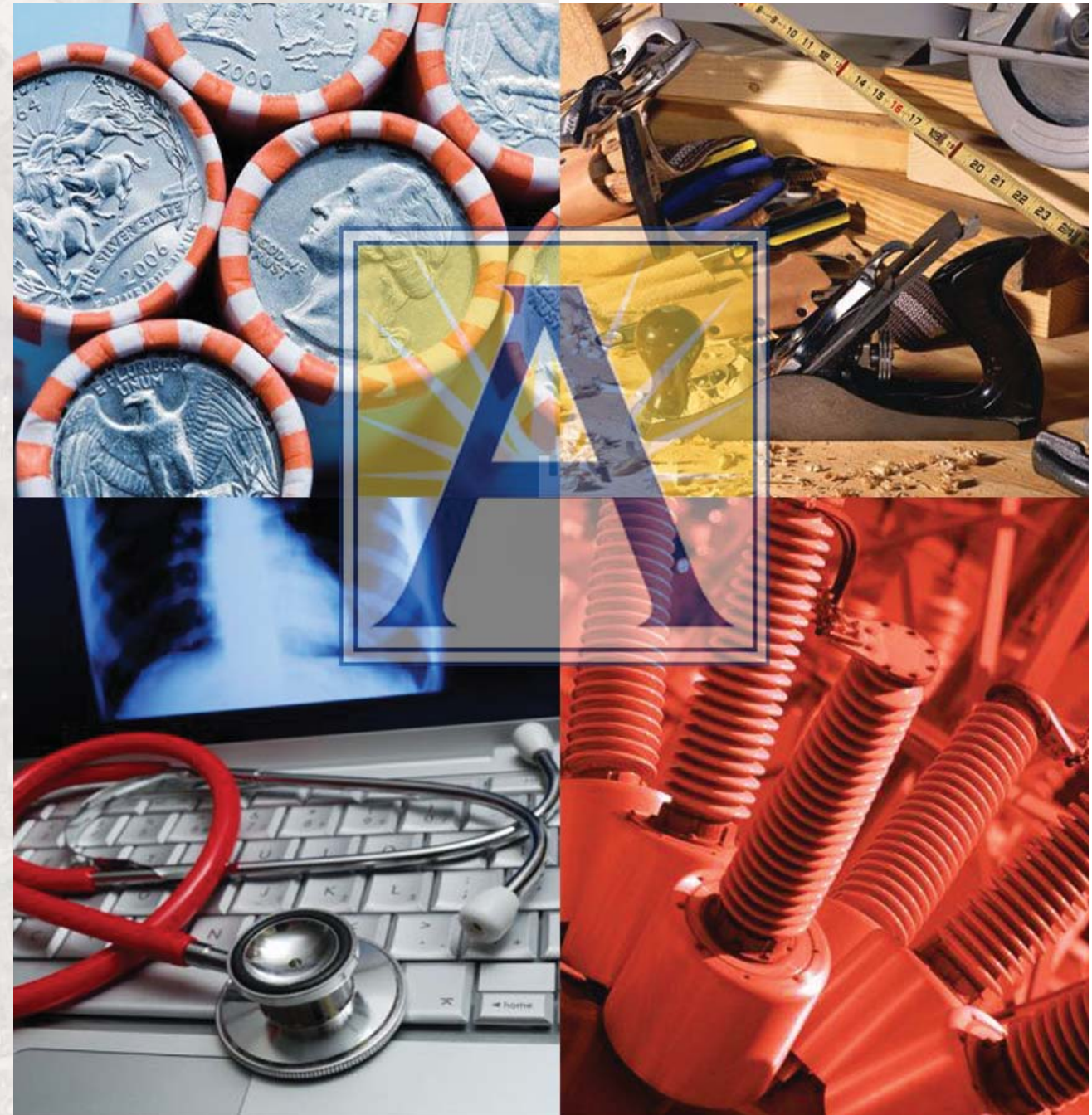


*Arlington Career Center
Feasibility Study*



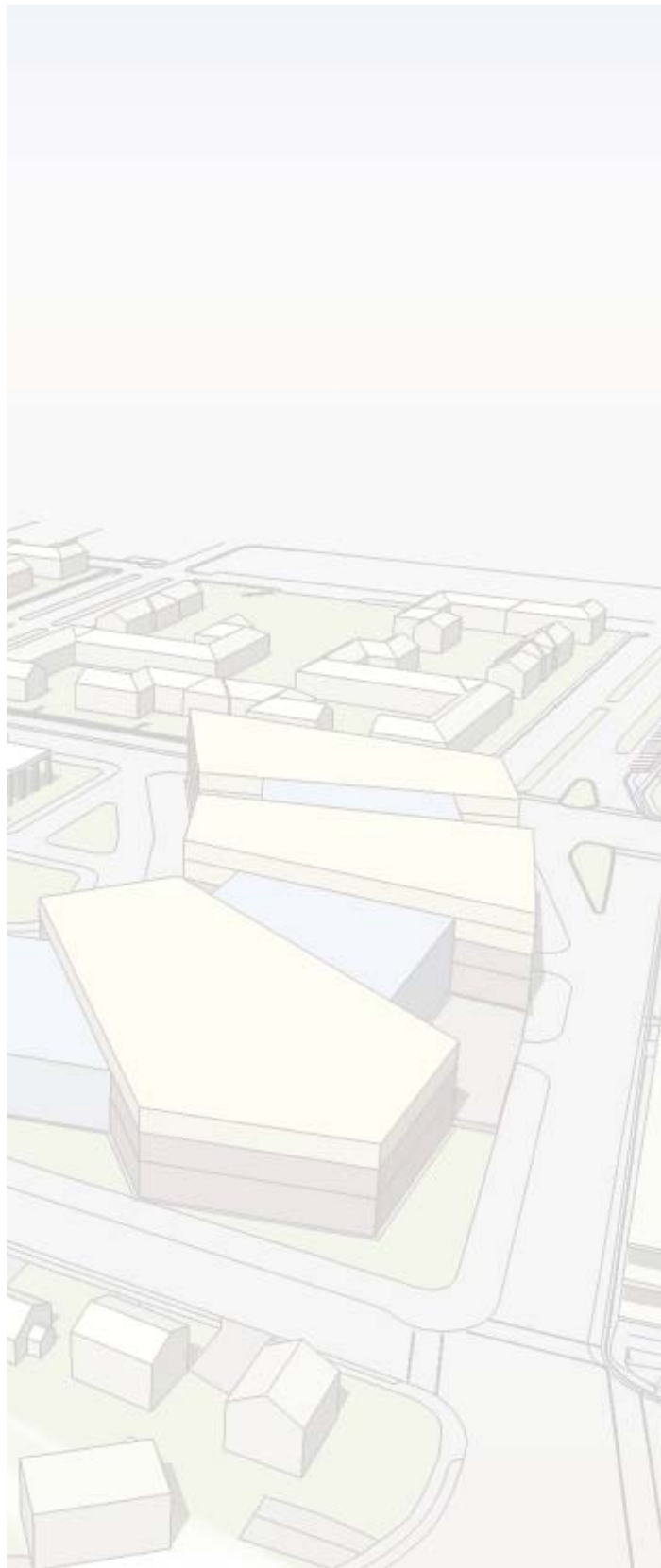


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CREDITS

Arlington School Board

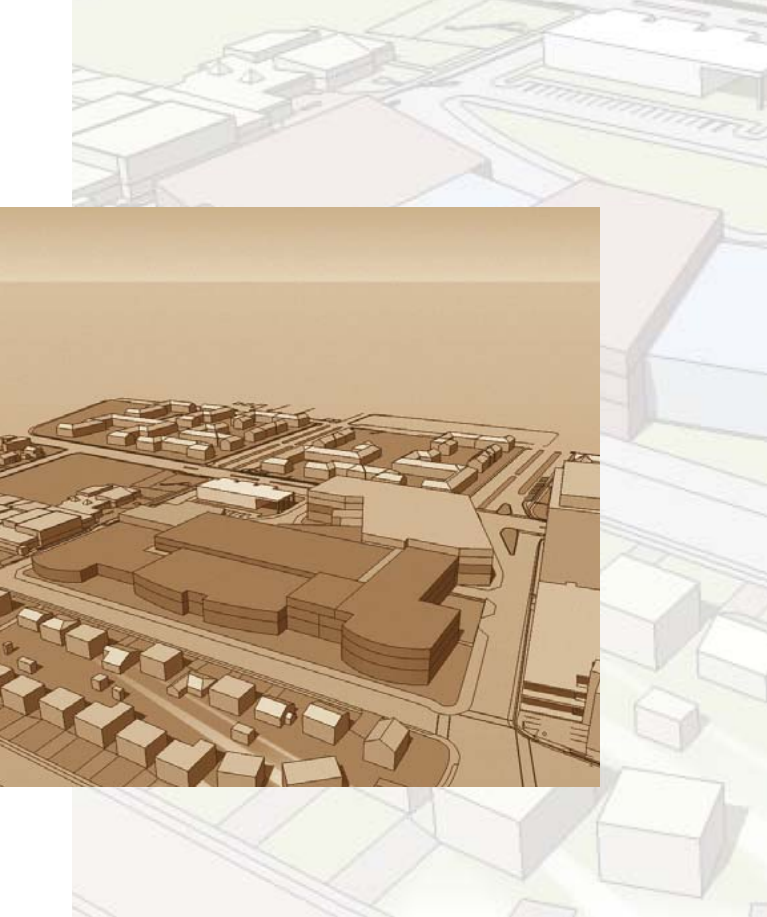
*David Foster, Chair
Ed Fendley, Vice-Chair
Sally M. Baird
Libby Garvey
Frank Wilson*

Arlington Public Schools

<i>Dr. Robert Smith</i>	<i>Superintendent of Schools</i>
<i>Clarence Stukes</i>	<i>Assistant Superintendent for Facilities and Operations</i>
<i>Dr. Mark Johnston</i>	<i>Assistant Superintendent for Instruction</i>
<i>Sarah Woodhead</i>	<i>Director, Design and Construction Services</i>
<i>Vaughan Olbrys</i>	<i>Project Manager, Design and Construction Services</i>

Building Level Planning Committee:

<i>Dr. Jerry Caputo</i>	<i>Career Center Principal</i>
<i>Nancy Opsut</i>	<i>Career Center Assistant Principal</i>
<i>Cindy Schall</i>	<i>Career Center Teacher</i>
<i>Ricky Sullivan</i>	<i>Career Center Teacher</i>
<i>Mike McGhee</i>	<i>Career Center Teacher</i>
<i>Shelia Napala</i>	<i>Career Center Teacher</i>
<i>Tom O'Day</i>	<i>Career Center Teacher</i>
<i>Lauren Geigan</i>	<i>Career Center Student</i>
<i>Sean Greiner</i>	<i>Career Center Student</i>
<i>Kathy Kingsford</i>	<i>Advisory Committee Parent</i>
<i>Beverly J. Petronello</i>	<i>Advisory Committee Parent</i>
<i>Teresa Estes</i>	<i>Career Center Parent</i>
<i>Catherine Harrison</i>	<i>Career Center Parent</i>
<i>Katherine Gathro</i>	<i>Career Center Parent</i>
<i>Randy Thomas</i>	<i>Career Center Parent</i>
<i>Donald Hodgen</i>	<i>Career Center Parent</i>
<i>John Snyder</i>	<i>School Facilities and Capital Programs Advisory Council</i>
<i>John Morrill</i>	<i>Arlington Heights Civic Association Representative</i>
<i>Betty Siegel</i>	<i>Arlington Heights Civic Association</i>
<i>Ernest Butler, Jr.</i>	<i>Penrose Neighborhood Association Co-President</i>
<i>Jackie Ware</i>	<i>Penrose Neighborhood Association</i>
<i>Lisa Larimer</i>	<i>Environment and Energy Conservation Commission Representative</i>
<i>Colleen Connor</i>	<i>Arlington County DCPHD Planning</i>
<i>Susan McCarthy</i>	<i>Special Projects Coordinator for Arlington Libraries</i>
<i>Eric Murdock</i>	<i>Arlington County Transportation Commission Representative</i>
<i>Christian Dorsey</i>	<i>Arlington County Planning Commission Representative</i>





Brian Stapleton
Kris Martini
Pat Teske
Sarah Woodhead
Vaughan Olbrys
Michael Foster
Dale Leidich

Educational Design Team

Chair:
Coordinating Chair:

Coordinating Team:
Kathleen Bragaw
Alison Denton
Gene Brown
Suzanne Swendiman
Mike Morton
Margaret Gilhooley
Sarah Woodhead
Vaughan Olbrys
Michael Carver
Alvera Wilson

Career/Technical Team:
Phyllis Gandy
Kris Martini
Marilyn Faris Scholl
Pat Teske
David Welsh
Jerry Caputo
Barbara Thompson
Elliot Johnson
Betty Sanders

Instruction Team:
Pat Robertson
Connie Skelton
Carol Erion
Julie Crawford
Cleveland James
Sara Pula
Marie Bullock
Francesca Reilly-McDonald

APS Special Education Coordinator
APS Technology Education Supervisor
APS Instructional Technology Services Supervisor
Director, Design and Construction Services
Project Manager, Design and Construction Services
Career Center Architect (MTFA Architecture)
Career Center Architect (MTFA Architecture)

Mark Johnston, Assistant Superintendent, Instruction
Mark Macekura, Coordinator, Special Projects

Specialist, Special Projects
Facilities Planner
Director, NVCC, Arlington Campus
Director, Alternative and Extended Instruction
Director, CTAE
Supervisor, Gifted Services
Director, Design and Construction Services
Project Manager
Director, Technology Services
Financial Analyst

Mike Morton, Team Leader
Supervisor, Business/IT/Computer Science/Marketing
Supervisor, Technology, Trade, and Industrial Education
Supervisor, Family and Consumer Sciences
Supervisor, Instructional Technology Services
Teacher, Career Center
Principal, Career Center
Administrator, Arlington Mill
Director of Counseling Services, Swanson
Assistant Principal, Wakefield

Margaret Gilhooley, Team Leader
Supervisor, Mathematics
Supervisor, Science
Supervisor, Arts
Director, Special Education
Administrator, Langston
Counselor, Yorktown
Director of Counseling Services, Washington-Lee
Specialist, ESOL/HILT Special Projects

Design Consultants:

MTFA Architecture - Architecture and Planning
Michael Foster, FAIA
James Clark, AIA
Dale Leidich, AIA
Brian Vassallo
Natalie Davito
Vishal Verma
Grace Lee
Nathan Sonoskey

Planning Alliance -Educational Planning
Sue Robertson, REFP
Mandolin Mauldin

VIKA - Site and Civil Engineering
Robert Cochran, LS
Ryan O’Gara, AICP

Ehlert/Bryan - Structural Engineering
James Leeuwrik, PE

E. K. Fox & Associates - Mechanical, Electrical, Plumbing
Engineering
Ben Crowley, PE

R.W. Brown Associates – Cost Estimating
Robert W. Brown

ECS Mid-Atlantic (Environment and Hazardous Materials)
Allen Sullivan



EXECUTIVE SUMMARY

Arlington Public Schools (APS) is in the last phase of an ambitious school renewal effort, which includes the Arlington Career Center. This study was commissioned to evaluate and develop the critical programming, planning and cost information needed to understand how this project fits into the Capital Improvement Plan (CIP), the APS' vision for technical and career-oriented education, and the overall economic land use stewardship for the County.

The project was initiated as a long-needed renovation and renewal of the existing facility. The project has been further influenced by critical objectives to address evolving educational imperatives and site utilization opportunities to positively affect the future of Career and Technical Education in Arlington:

The following influences have affected the process and results of this study:

1. To need to respond to rapidly changing educational requirements for job seeking in the current and future workplace.
2. The desire to better serve and enhance continuing education.
3. The need to give vocational and career education students an integrated pathway to jobs and continuing education.
4. The opportunity to better serve CTE students through partnerships in the work place and with higher education.
5. The need to respond to and address the recommendations of the Multi-Site Study to more efficiently use the site for other APS and County needs and to reduce the costs of leased space.
6. The creation of more functional and efficient community library.

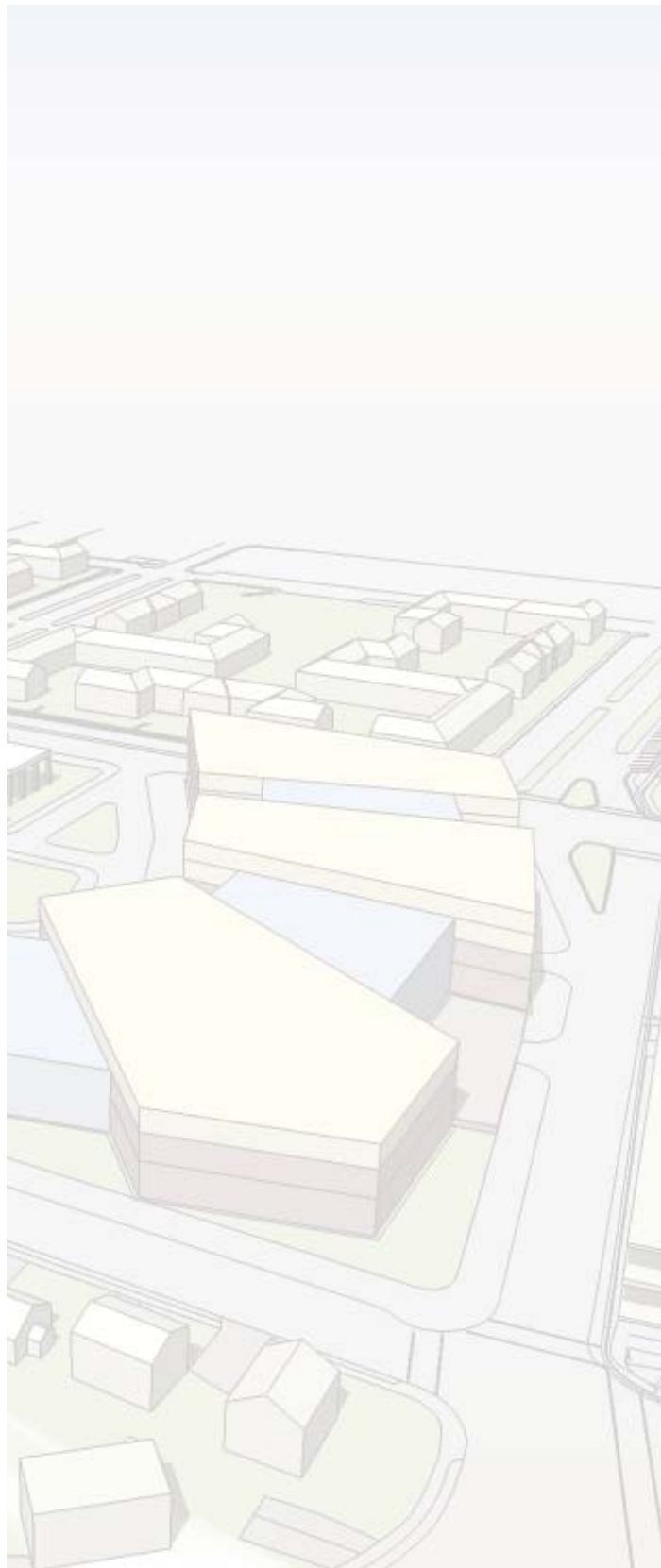
7. The desire to understand and address the Superintendent's recommendation to enhance and expand the Science, Technology, Engineering, and Mathematics (STEM) curriculum, which exists within the present Career and Technology Education (CTE) curriculum, so that valuable resources can be used by more students.

MTFA prepared this study in collaboration with Arlington Public Schools' Design and Construction Services, the Career Center Building Level Planning Committee, the APS Educational Design Team (specifically assembled to delineate the educational vision and goals for the project), and a team of highly qualified professional engineers and planners. The study includes a detailed evaluation of the existing Career Center building, educational planning information about the CTE and STEM programs and space requirements. The study also explores four site development concept options for implementing the programs. Each of these is consistent with the recommendations of the Multi-Site Study.

In addition to the guiding principles collectively developed for the project, this study demonstrates that it is possible to celebrate and distinguish the existing Arlington educational opportunities within a larger campus community. The campus setting allows synergies among diverse student needs, which will enrich the existing alternatives for students.

This study presents an exciting and innovative vision for a future educational pathway in Arlington. It's also a unique opportunity to support the revitalization of Columbia Pike through community design excellence.





THE DESIGN PROCESS

THE INITIAL CHARGE

MTFA Architecture was selected by Arlington Public Schools (APS) to provide architectural and engineering design services for the renovation of the Arlington Career Center. The project is part of a multi-phase modernization and facility renewal program initiated by APS in the late 1980's.



Career Center Photo by Daniel Ryan (PRIME Intern)

THE MULTI - SITE STUDY

The Multi-Site Study is a comprehensive study initiated by APS to evaluate the economic and development potential of APS properties and determine the most effective and efficient use of those properties. The Multi-Site Study was being conducted concurrently with the planning and design efforts for the Career Center, and it included the evaluation of options affecting the Career Center. Consequently, the planning and programming efforts for both the Multi-Site Study and Career Center renovation were linked.

The recommendation of the Multi-Site Study was to replace existing leased space, to replace APS administrative offices and to consolidate the Langston-Brown and Arlington Mill High School Continuation programs at the Career Center site. Because of the recommendation of the Multi-Site Study, the scope of work and evaluation goals changed from simply housing the existing program to include the recommendations of the Multi-Site Committee and the Superintendent.



Multi-Site Study - Committee's Preferred Scenario

THE CTE/STEM INITIATIVE

Concurrent with the Multi-Site Study and the initial scope of work, the Superintendent of Arlington Public Schools proposed that a Science, Technology, Engineering, and Mathematics (CTE/STEM) educational initiative be integrated into the Career Center planning effort to supplement and enhance the existing programs and provide additional educational opportunities. Further, this initiative proposed the co-location of higher education programs and educational opportunities at the Career Center to provide diverse dual-enrollment and dedicated college educational opportunities. Northern Virginia Community College (NVCC) has participated in the planning effort and has expressed a strong desire to provide higher educational programming through both dedicated and shared-use space.



THE EDUCATIONAL PLANNING

A planning and programming effort was begun in order to understand and quantify the needs of the existing programs, as they related to the renovation and renewal of the Career Center. This effort was paused briefly due to the influences of the Multi-Site Study and the CTE/STEM initiative. To evaluate and quantify the changes in broad terms, APS established an Educational Design Team composed of teachers, administrators, counselors, the architectural design team and its educational planning consultant. The Educational Design Team, lead by APS staff, conducted a comprehensive discussion of curriculum, needs, goals, and principles for implementing the CTE/STEM initiative. It addressed the consolidation of the High School Continuation Programs and integration of the higher education opportunities.

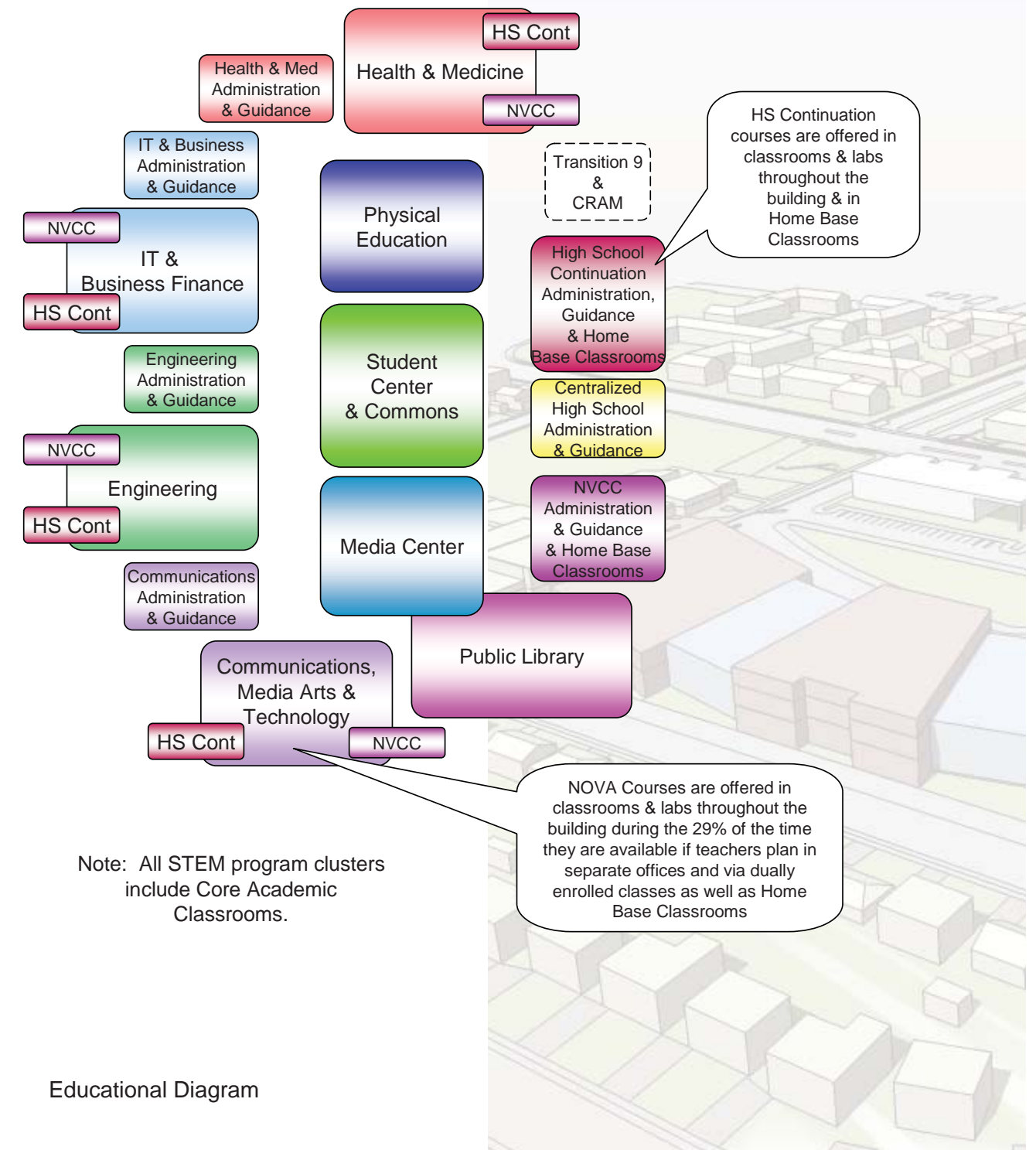
The discussions occurred during the months of May and June 2009, resulting in a detailed draft educational specification prepared by MTFA Architecture's educational consultant, Planning Alliance. The draft educational specification includes a capacity model, a detailed space program, individual program breakdowns and qualitative requirements, and relational diagrams that form the basis of the design options presented in this report. The detailed draft educational specification is not included in this report, but the capacity model and summary space program are included.



Educational Specification Interview

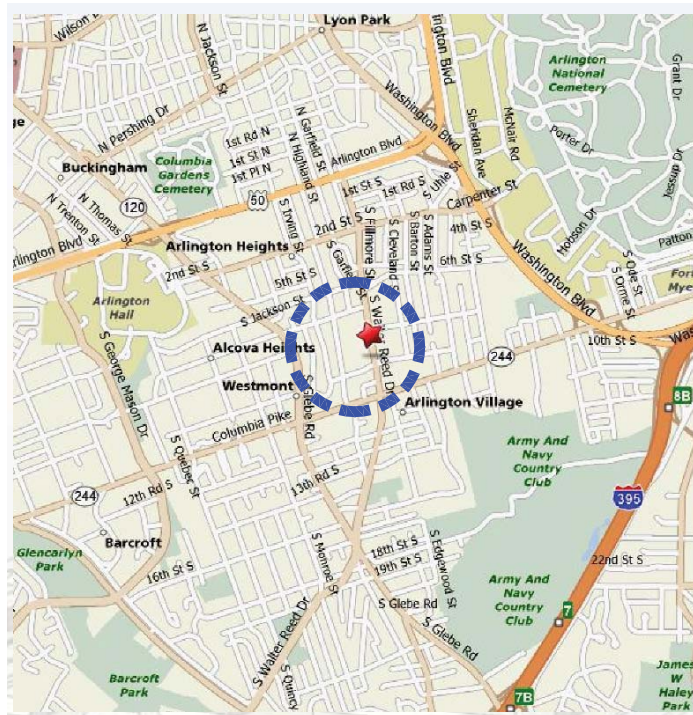
THE BUILDING LEVEL PLANNING COMMITTEE (BLPC)

The Arlington School Board established a BLPC for the Career Center Renovation project, which began the collaborative community process related to the renovation of the Career Center. Because of the significant change in direction resulting from the Multi-Site Study recommendation, the superintendent's CTE/STEM initiative, and the time necessary to allow the Educational Design Team to develop an appropriate educational specification, only four meetings were held by the BLPC.

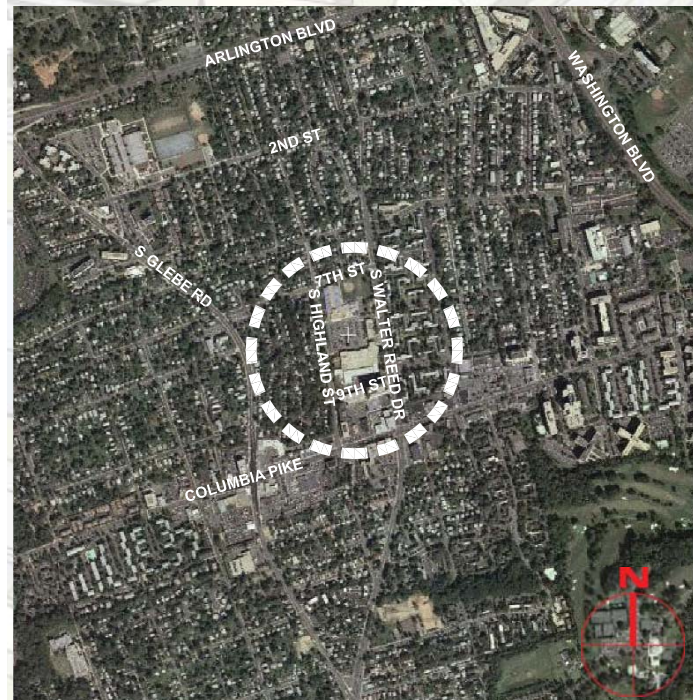


Educational Diagram

THE CONTEXT



Location Map



Career Center 816 Walter Reed Drive

LOCATION

The Career Center is located one block north of Columbia Pike on S. Walter Reed Drive. The site is bounded on the east by S. Walter Reed Drive, on the south by 9th Street South, on the west by South Highland Street, and on the north by 7th Street South.



Columbia Pike Library



Arlington Career Center



The Fenwick Center

NEIGHBORHOODS

The neighborhoods surrounding the Career Center include a historic apartment community called Fillmore Gardens to the east, the Columbia Pike Corridor to the south, Arlington Heights to the north, and Alcovia Heights to the west.

The historic Fillmore Gardens Apartment community is a post-war era garden apartment community composed of separate three story apartment buildings with brick exteriors and gabled roofs. The apartments are occupied by residents with a broad range of economic and ethnic backgrounds typical of Arlington's diverse population. The grounds of the community are characterized by mature landscaping with broad lawns between buildings. Parking is located on the street or in pull-off parking areas on the grounds of the community.

The Arlington Heights and Alcovia Heights post-war era neighborhoods are residential single family and duplex style detached residences. These neighborhoods are characterized by houses and duplexes constructed of brick with both flat and gabled roofs. The streets are lined with mature trees and sidewalks. Parking is located on the street and in individual driveways adjacent to each residence. Like in Fillmore Gardens, residents are people from a broad range of economic and ethnic backgrounds. There are many families with school aged children.



S. Walter Reed Drive

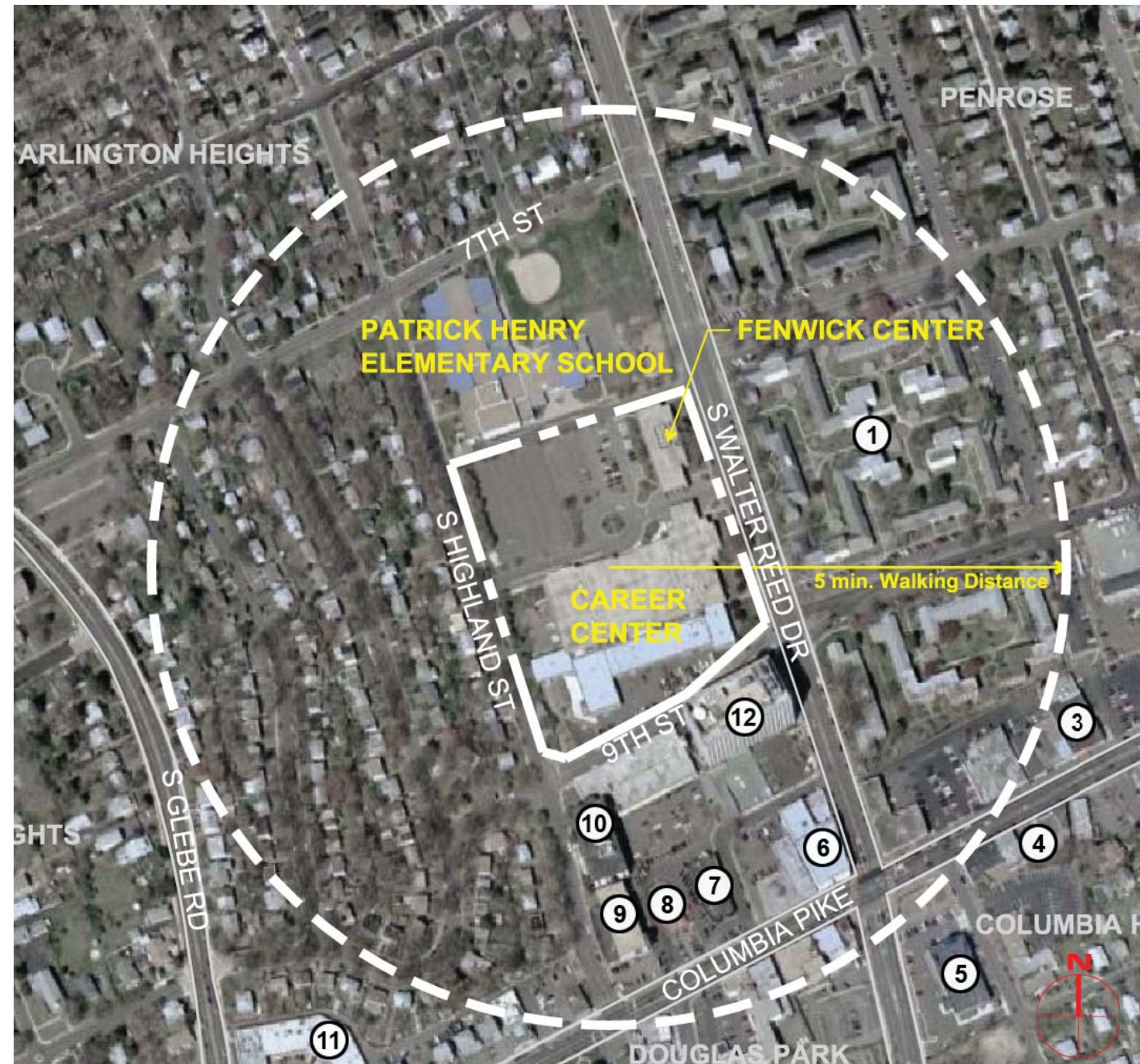


AMENITIES

Because of the proximity to Columbia Pike and S.Walter Reed Drive, the Career Center has convenient access to major Metro bus routes. Within a five minute walk from the site are the following (refer to adjacent map for location)

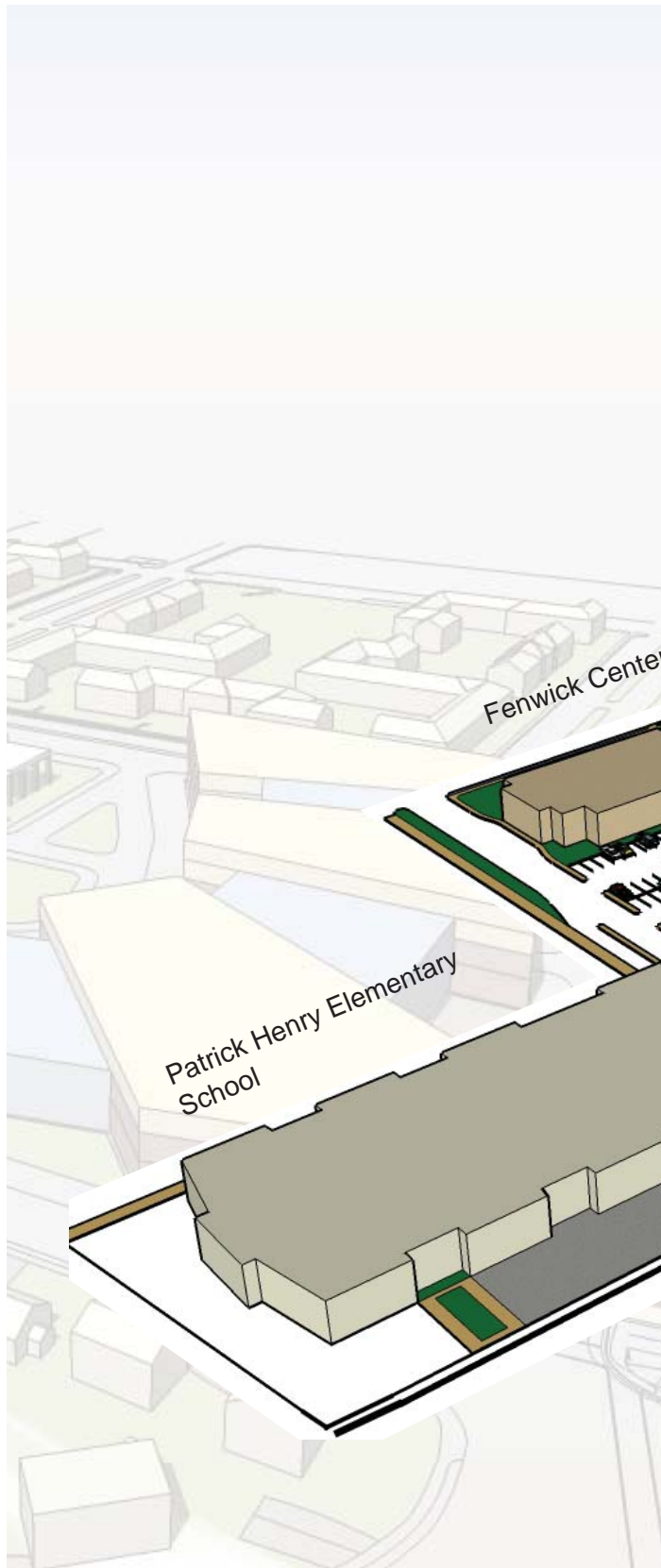
1. Fillmore Gardens Apartments
2. Adams Square Mall (Giant Food and retail shops)
3. CVS Pharmacy
4. Arlington Village Center (Shops)
5. Eckerd Pharmacy
6. Arlington Cinema 'N' Draffhouse
7. 7-Eleven
8. McDonald's Restaurant
9. Highland Building (medical, retail, offices)
10. Ethiopian Community Development Council
11. Westmont Shopping Center (retail shops)
12. AT & T Building (offices)

The Columbia Pike corridor has been targeted by Arlington County as a key economic development zone, which will inevitably increase the visibility and relevance of the facility within the context of its neighborhood and as a key public amenity itself.



Career Center Location And Amenity Map





THE EXISTING FACILITY

GENERAL OVERVIEW

The Career Center is a two-story structure built in 1973, which houses instructional classrooms, administrative offices, specialized vocational and technical training labs, a child care and pre-school program, offices and studio space for Arlington Educational Television, and a branch of the Arlington Public Library. The Career Center has been continuously operated for its originally designed use, since its opening.

THE SITE

The Career Center site is a block away from Columbia Pike. The site is approximately 8.5 acres. It contains a parking lot, combination car and bus circulation roadway, a playground and playground structure, and an enclosed surface parking area associated with the automotive instructional program.

Site utilities include underground electric, natural gas, and public domestic water and sewer. Storm water is handled by direct connection to the public storm sewer or surface absorption (scupper and downspouts). The on site surface parking areas, including the enclosed parking area for the automotive program, are displaying significant signs of deterioration and are in need of re-paving or overlay paving. The on site concrete sidewalks are generally in good condition and only need minor remedial work.

ZONING

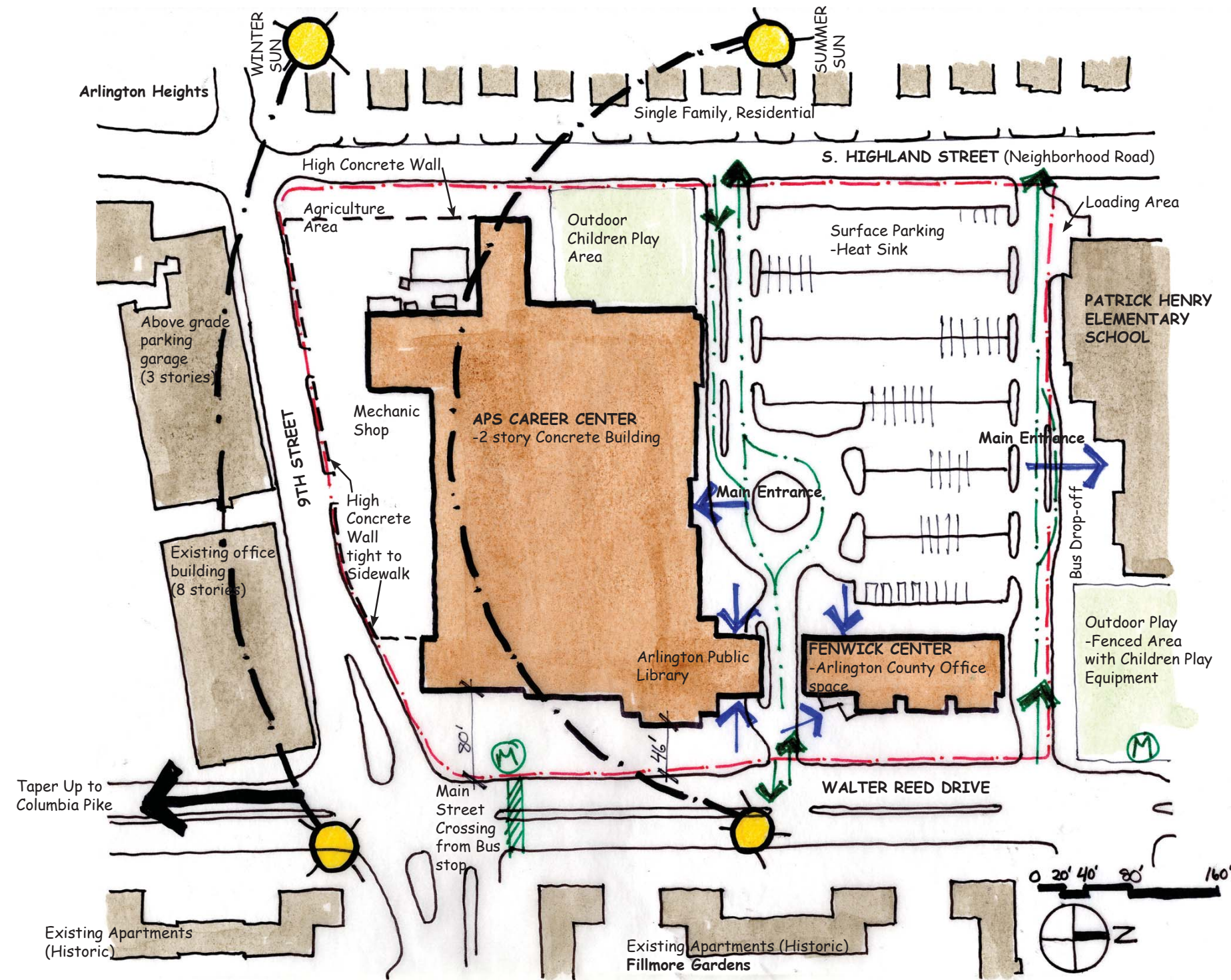
Because the project will significantly alter the existing facility, a Use Permit will be required. The process by which the Use Permit will be obtained is currently under review by APS and Arlington County. The project does not fall into the Form Based Code. However, the general design guidelines and planning principles contained in the Form-Based Code are considered to be valuable and APS and the design team will work to incorporate these guidelines and principles into the proposed solution, when possible.

In addition to the Career Center, Patrick Henry Elementary School and the Fenwick Center also occupy this site. Below is a summary of specific information related to the site:

Zoning Type:	S-3A
Size of the Site:	8.539 acres
Parcel Number:	RPC# 25014004
Set back requirements:	50 feet from the street centerline or 25 feet from the street right-of-way
Height Limitation:	45 feet or as allowed by special use permit
Allowable Square Footage:	To be determined
Utilities:	
	Gas – Washington Gas
	Water – Arlington County
	Electric - Dominion Virginia Power
	Sewer/Strom Sewer – Arlington County
	Telephone – Verizon
	Cable – Comcast



SITE ANALYSIS



Aerial Photograph

THE BUILDING EXTERIOR

Roof

The two-story portion of the building has a built-up roofing system over rigid insulation on concrete decking supported by a concrete structural frame. These areas are considered to be flat, as the roofing system itself actually provides the slope to the roof drains. The one-story high-bay portion of the building, located over the mechanical and automotive program areas, consists of concrete decking material supported by open-web steel joists. The joists and the decking are sloped, so this portion of the roof is considered to be a low-sloped roof, because the structure actually provides the slope to drainage. The roof system over this area is also built-up type over rigid insulation.

With the exception of intermittent roof leaks encountered seasonally, the roof systems have generally been performing properly. The built-up roof over the main part of the building is approximately 15 years old. The roofing system over the rest of the building is approximately 10 years old. Both roof systems are exhibiting normal deterioration typical of this type of roof system, such as surface cracking, minor surface buckling, thinning of the wear layer and associated aggregate, and minor isolated soft spots.

Exterior Walls

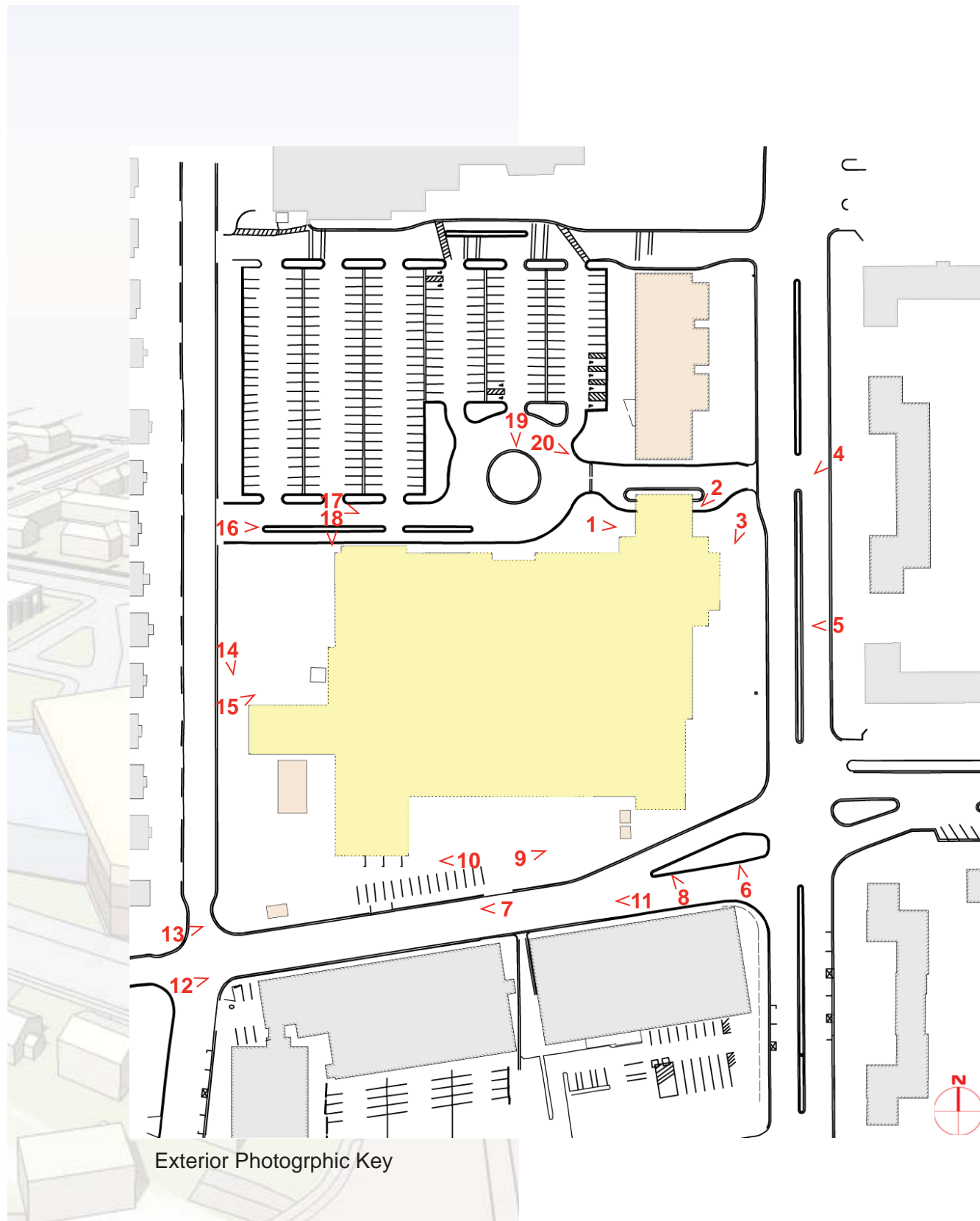
The exterior of the building consists of a combination of cast-in-place concrete wall panels and precast window and wall panels. In general, both appear to be performing well and only minor deterioration and surface degradation were observed. The exterior of the building, as is the case with most concrete exterior wall systems, is susceptible to the build-up of surface dirt and grime. The appearance of the facility could be greatly enhanced, if the exterior surfaces were professionally cleaned.

The surface degradation observed includes damage from vehicles, minor cracking, voids in the continuity of the material from casting, and steel reinforcing that has rusted from exposure to moisture. In all cases, the observed deficiencies were limited in nature and do not appear to affect the integrity of the exterior envelope, but they should be repaired, so that they do not become problematic in the future.

Exterior Doors and Windows

The windows are thermally broken commercial-grade aluminum windows with double pane insulated glazing. From discussion with staff, it appears that the windows were replaced approximately 12 years ago. The windows are in good shape and there are no performance issues. Minor deterioration of sealant around windows was observed, but it was not pervasive. A comprehensive review and repair of all exterior sealants should be performed, as suggested above, on a periodic basis as part of a routine maintenance plan.

The aluminum storefront and doors in the facility are in reasonable condition and performing well. It appears that these were replaced at the same time as the windows. Access and service doors located around the building should be surveyed and repaired. Deteriorated doors, door hardware, frames, and seals were observed in most of the conditions. In addition to functional improvements, repairs will enhance the safety and security of the school.



Refer to the Exterior Photographic key on page 11.



Photograph 1



Photograph 2



Photograph 3



Photograph 4



Photograph 5



Photograph 6



Photograph 7



Photograph 8



Photograph 9



Photograph 10



Photograph 11



Photograph 12



Photograph 13



Photograph 14



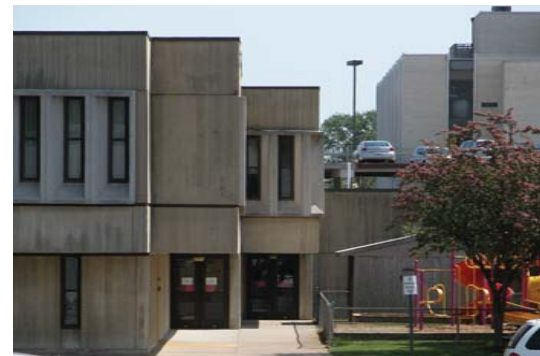
Photograph 15



Photograph 16



Photograph 17



Photograph 18



Photograph 19



Photograph 20

THE BUILDING INTERIOR

Interior Finishes

The interior of the building consists of a combination of VCT, carpet, and terrazzo flooring, painted drywall, painted masonry units, painted demountable walls, and acoustical panel ceilings, with exposed concrete and brick in many locations.

In general, the interiors appear to be well maintained and in very serviceable condition. The VCT floors appear to be in satisfactory shape and should perform well for the foreseeable future with ongoing maintenance. Most locations with carpet appear to be in reasonable condition and properly maintained. The terrazzo flooring is in very good condition, with the exception of normal and anticipated minor cracking. Terrazzo has an almost indefinite service life.

All walls and wall surfaces in the building appear to have benefited from an ongoing maintenance program and are performing well. The demountable partitions, which date back to the initial occupancy of the building, are still serviceable, but are not as flexible and easy to reconfigure as drywall partitions. The drywall partitions, painted block walls, and exposed surfaces in the building are clearly included in an ongoing maintenance program and should perform well indefinitely.

The ceilings in the building, like the walls and floor, are in reasonable condition and consist of acoustical panel and drywall ceilings in most of the standard instructional spaces. The specialized instructional spaces typically have exposed ceilings. Acoustically, the standard instructional and administrative spaces perform adequately, which is not uncommon given the vintage of the building

and the typical finishes. In the specialized instructional spaces, the exposed ceilings and the hard surfaces result in poor acoustic performance. The inherent acoustic performance and educational effectiveness of student learning could be enhanced through a comprehensive review and targeted improvements in materials and finishes.

The most significant observation about the interior materials and finishes is that of character and perception. The building is clearly a product of its time (early 1970's) and as such appears to be dated and somewhat dark. While this does not directly affect the usefulness of the building for its intended use, it does affect the perception of users and visitors. The building has very limited opportunities for natural lighting and relies almost entirely on artificial fluorescent lighting. Based on a number of recent studies, the addition of natural lighting could positively impact student learning and create a more pleasing and welcoming interior environment for all.



Career Center Lobby



Automotive Technology Lab



Aeronautics and Engineering Lab



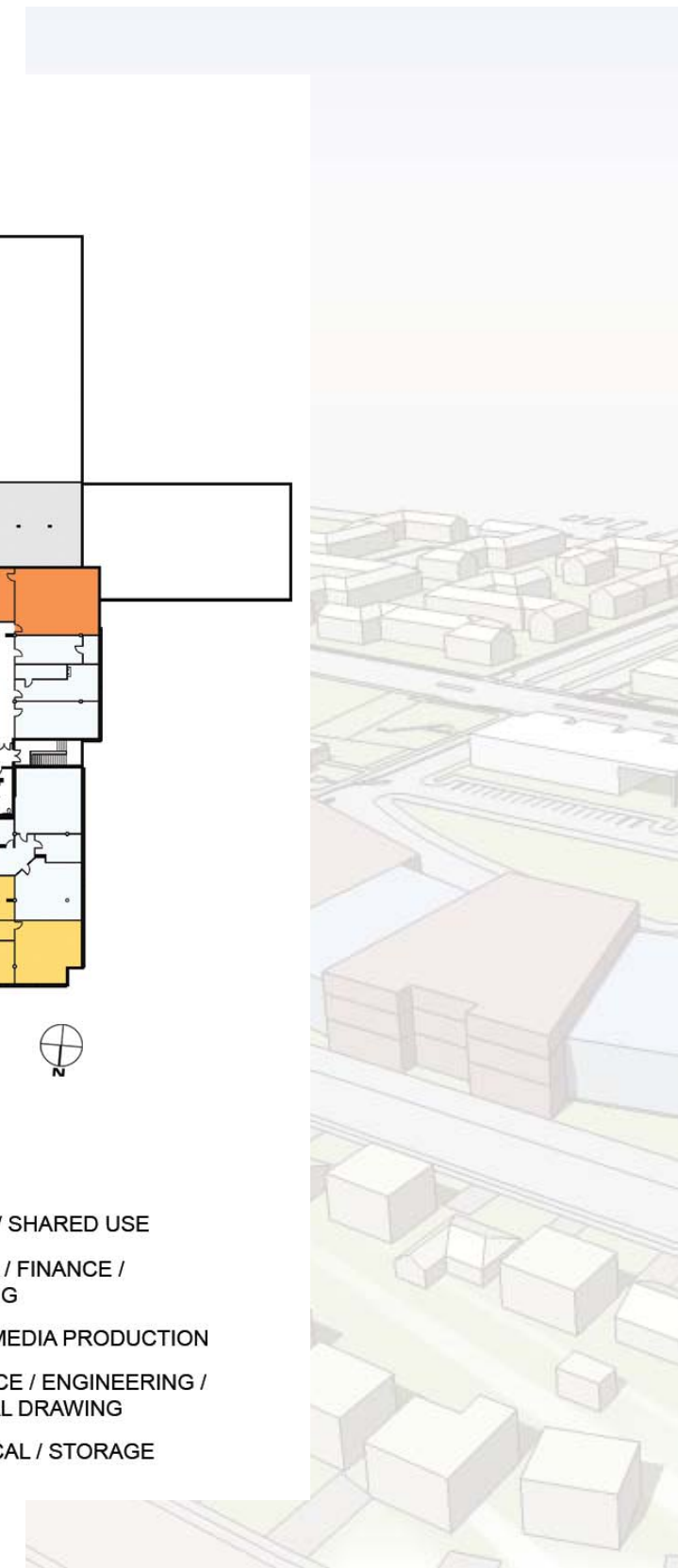
Culinary Arts Kitchen



INTERIOR PHOTOGRAPHIC KEY



- | | | | | |
|--------------------------------------|-----------------------------|-------------------------------|-----------------------------------|---------------------------------------------|
| EXPERIENCE BASED CAREER EDUCATION | FORENSICS | COMPUTER SYSTEMS / TECHNOLOGY | MECHANICAL / HVAC / REFRIGERATION | COMMON / SHARED USE |
| SPECIAL ED. ASSESSMENT | AUTO BODY / AUTO TECHNOLOGY | ADMINISTRATION | CARPENTRY / ELECTRICITY | BUSINESS / FINANCE / MARKETING |
| DIGITAL PHOTOGRAPHY / COMMERCIAL ART | AIR FORCE JROTC | ARLINGTON EDUCATIONAL TV | ANIMAL SCIENCE | TV / MULTIMEDIA PRODUCTION |
| COSMETOLOGY | CRAM / HILT / SWAT | PHYSICAL THERAPY / EMT | CULINARY ARTS | AEROSPACE / ENGINEERING / TECHNICAL DRAWING |
| | | EARLY CHILDHOOD / PRESCHOOL | MECHANICAL / STORAGE | |



Refer to the Interior Photographic key on page 14.



Photograph 1



Photograph 2



Photograph 3



Photograph 4



Photograph 5



Photograph 6



Photograph 7



Photograph 8



Photograph 9



Photograph 10



Photograph 11



Photograph 12



Photograph 13



Photograph 14



Photograph 15



Photograph 16



Photograph 17



Photograph 18



Photograph 19



Photograph 20



Photograph 21



Toilet Rooms

The toilet rooms in the Career Center are very basic and appear adequate for the current population. Minor adaptations have been implemented to provide handicapped accessibility, primarily at water closets. Lever handles, fixture heights, and accessory heights (mirrors) generally have not been addressed to meet ADA guidelines. The quantity of fixtures and sizes of the toilet rooms are inadequate by modern standards and code requirements, but this is typical for a building of this age. In general, the toilet facilities are meeting the daily needs and demand, except when special functions are held with above average attendance.

The toilet rooms are well maintained and serviceable. The floors are typically ceramic tile and the walls are either painted masonry or painted dry-wall.



Typical Toilet Room

Doors and Door Hardware

Both doors and door hardware are functional and adequate. There is a mixture of hollow metal and wood doors. At rated assembly locations, door hardware, including closers, generally bear the appropriate rating certifications and function correctly. There are a number of locations where both doors and door hardware need repair or adjustment, as is the case with any facility of this type. Ongoing maintenance and periodic monitoring of deficiencies should address these deficiencies and allow both to function adequately into the future.



Typical Exterior Door

Hazardous Materials/Environmental

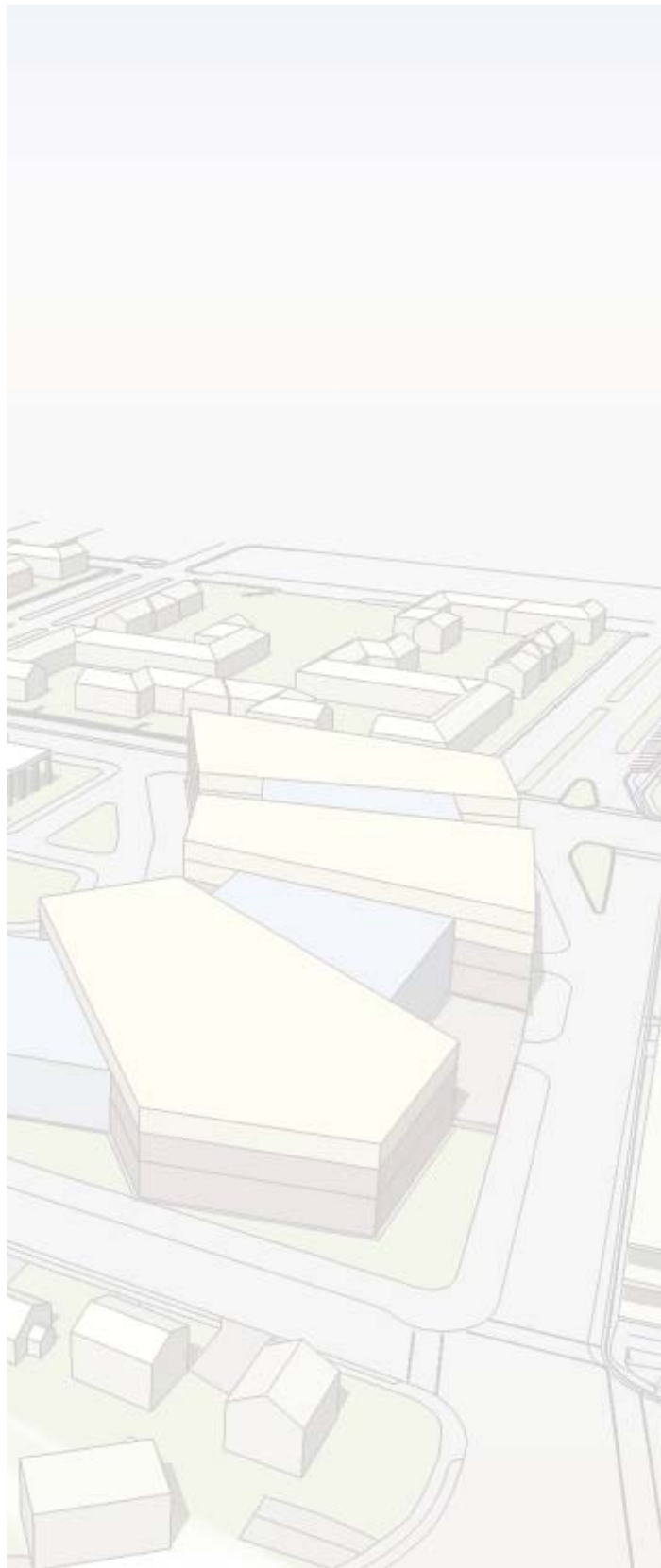
A hazardous material survey was conducted by ECS, Ltd., titled "Hazardous Materials Survey, The Career Center, 816 Walter Reed Drive, Arlington, VA", and dated March 12, 2007. The hazardous materials survey has identified a number of locations where asbestos containing material are present, but in all cases the material is in non-friable form. These locations can be left untouched, as long as they are not disturbed. From a long term perspective, it is always good to retain certified professionals to remediate these materials as part of an ongoing maintenance program. The estimated cost of remediation is approximately \$220,000. A copy of the report has been provided to Arlington Public Schools

A Phase I Environmental study was conducted for the Career Center, titled "Phase I Environmental Site Assessment, The Career Center, 816 Walter Reed Drive, Arlington, VA" and dated March 13, 2007. No significant environmental issues were identified. A copy of the report has been provided to Arlington Public Schools.



Career Center Playground





Preliminary ADA Access review

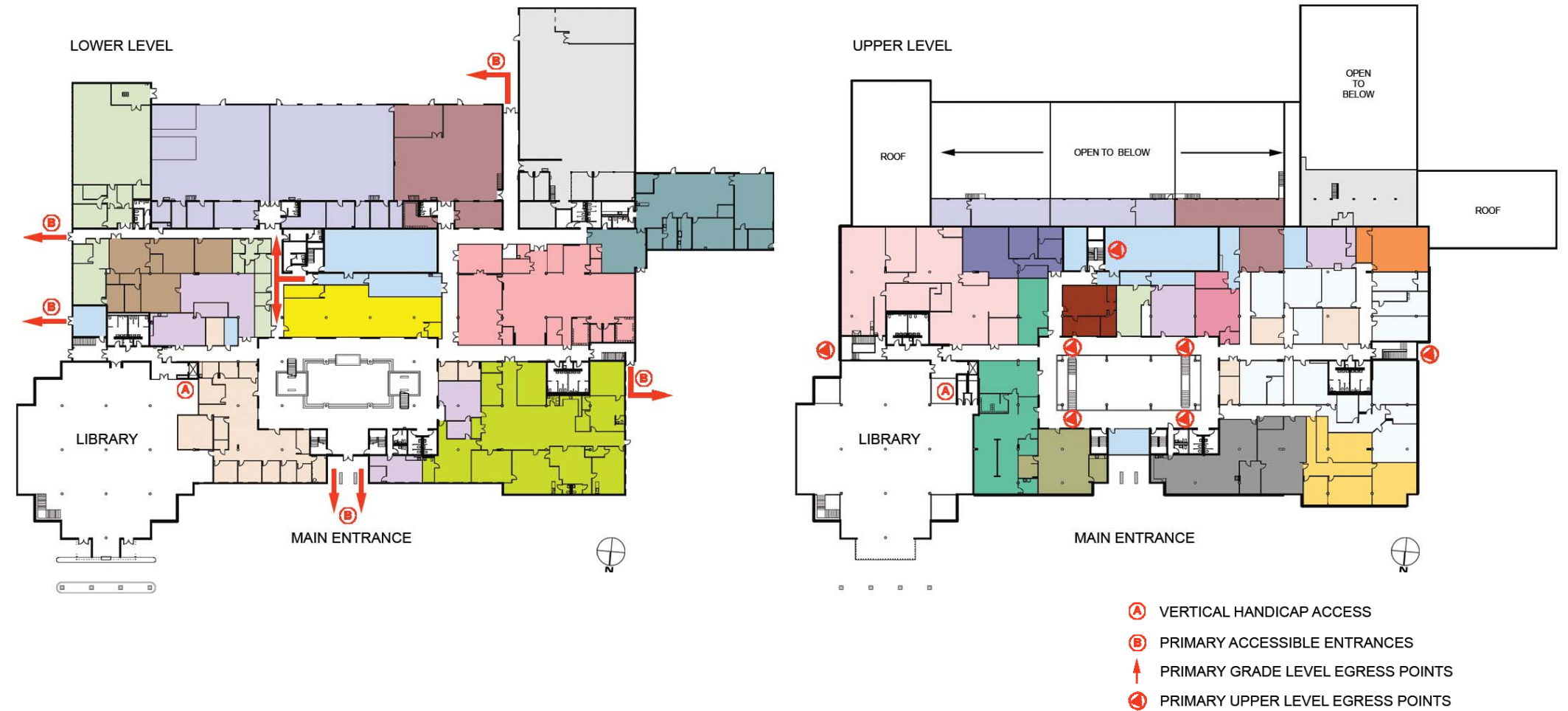
Because of the vintage of the building and the fact that it has not been renovated, changed use, or significantly updated since being constructed, compliance with current ADA technical standards is not required if pragmatic access is provided. However, significant improvements to achieve closer compliance are recommended to facilitate use and mitigate potential safety issues, particularly access across heavy traffic areas.

The parking lot and route to the front of the building do not meet current standards. Deficiencies in signage, number of parking spaces, curb ramps, and accessible routes were noted. Accessibility accommodations on the interior of the

building are limited in nature. Door hardware, toilet fixture hardware, toilet fixture heights, toilet accessories, stair railing extensions, signage, and door clearances are not in compliance with current standards. There is an elevator that allows access to the second floor of the facility, but it has not been updated to comply with current requirements.

Egress

The building has a number of grade level egress routes out of the facility and fire-rated stairwells exiting directly to grade. The egress routes, door widths, and stair railings do not comply with current code requirements, which are more stringent than the requirements at the time the facility was designed and constructed. Since the building has not been renovated or changed use, the existing egress pathways and requirements are adequate for the facility and do not have to be brought up to current standards, until a substantial renovation is undertaken.



Access and Egress Plan



STRUCTURAL

Existing Building

The existing building is a one and two-level, cast in place concrete structure with two distinct parts. The two-level portion of the building houses mostly classroom and administrative areas (Photograph 1), while the one level portion in the rear houses the high bay shop classrooms for building construction, auto trades, and animal science instruction (Photograph 2). In the central region of the building there is an atrium, or two-story space, that occupies three building bays (photograph 11).

Where the one-story portion of the building abuts the two-story portion, there are mezzanines, accessible only through the shop classrooms (Photograph 3 and 8). The roof above these mezzanines is lower than the two adjacent roof planes and has parapet walls around its perimeter, forming a yard used for the placement of roof top mechanical units (Photograph 4).



Photograph 3



Photograph 4



Photograph 8



Photograph 12

Along portions of the south and west edges of the property, there are cast in place concrete site walls that retain earth for a significant portion of their length (Photograph 12).

Structural Systems

At the two-level portion, the typical bay of the floor and roof structure consist of a reinforced, two-way, 9 inch thick, flat concrete slabs with 4½ inch drop panels at the columns (Photograph 5). Columns are typically 18 inch round concrete columns. The building has two expansion joints through the shorter dimension of the elevated floor and roof (Photograph 6 and 7). The joints isolate the building slabs at the one-quarter and the three-quarter points of the building footprint.



Photograph 5



Photograph 1



Photograph 2



Photograph 11



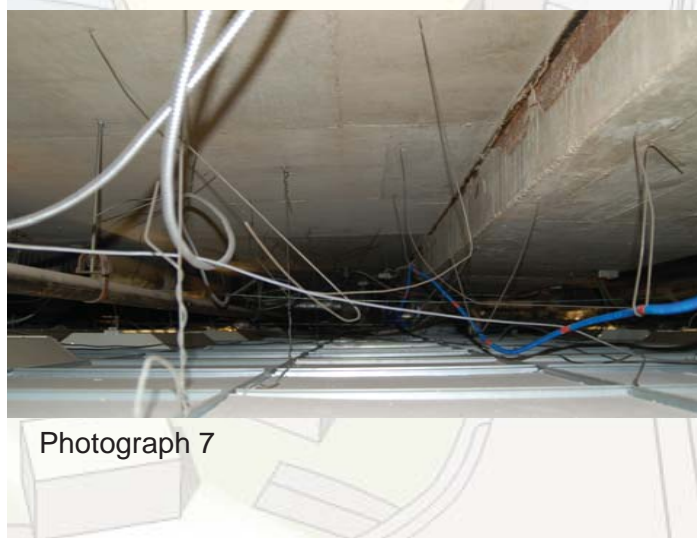
Photograph 6

Immediately around the atrium, the floors are framed with flat concrete slabs supported on cast in place concrete beams. These beams project past the slab edge extending to two-story columns that are situated within the two-story atrium space (Photograph 11). There are stairs at each end of the atrium that consist of cast in place concrete construction.

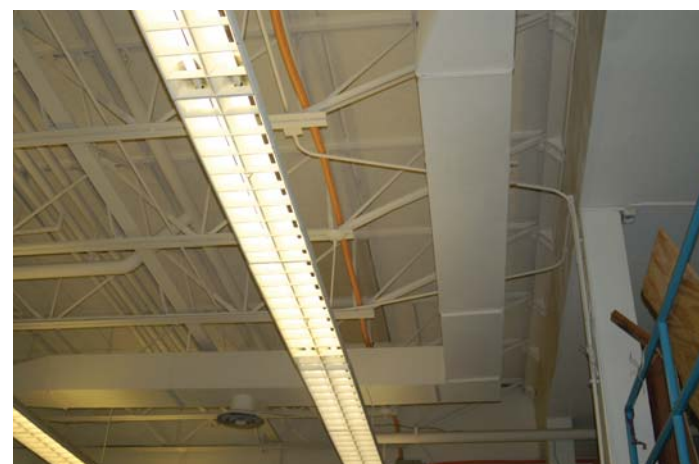
At the one-story portion of the building, the roof structure consists of long-span, open-web, steel joists supporting a 3 inch composition roof slab (Photograph 8). The joists are supported on 10 inch, load bearing, cast in place, concrete walls by means of a stiffened angle ledger bolted to the vertical concrete surface (Photograph 9 and 10).



Photograph 9



Photograph 7



Photograph 10

The mezzanine floor and roof immediately above the mezzanine consist of cast in place, concrete, flat slab construction. These slabs are supported on cast in place concrete walls, with some concrete beam and column construction where there are openings in the bearing walls (Photograph 3 and 8).

The ground level floor of the building consists of a 6 inch thick concrete grade slab. The original structural drawings identify that the building is founded on conventional spread footings. Lateral stability of the building appears to be provided by some frame action of the concrete columns, but mostly by the shear action of the cast in place concrete walls (Photograph 1 and 2).

General Condition

Overall, the building is structurally in fair condition. The structure of the building is performing adequately, though perhaps, not as well as was intended by design. At the exterior of the building, the issues noted consist of minor concrete deterioration at sporadic locations around the building perimeter (Photographs P1 through P8). Items of note are:

- cracks in the concrete wall
- concrete spalls with exposed and corroded reinforcing bars
- erosion of concrete surfaces



Photograph P1



Photograph P2



Photograph P3





Photograph P8

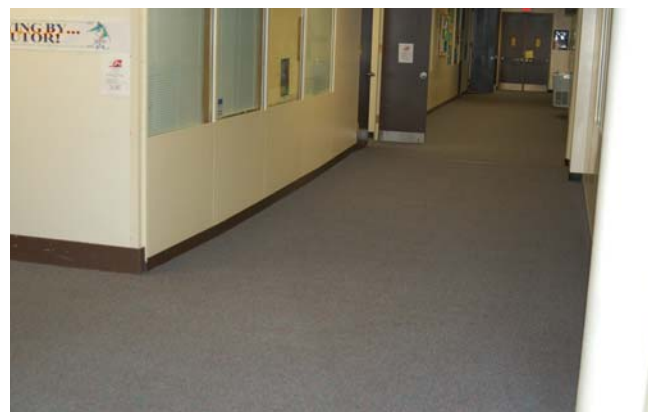
At the interior of the building, one significant issue was observed to occur at two specific locations. Significant deflection of the elevated floor slabs was observed at each side of the column lines along the two expansion joints (Photograph P10 and P11). Based on our discussion with some of the staff in the building at the time of the survey, this condition has been evident for a long time.



Photograph P10



Location of Structural Deflection



Photograph P11

Review of the underside of the 10 inch, two-way, slab reveals the presence of hairline pattern cracking (Photograph P12). The cracks are present in the mid-span of the building bays each side of the expansion joints and tend to run predominately in a direction parallel to the adjacent expansion joint.



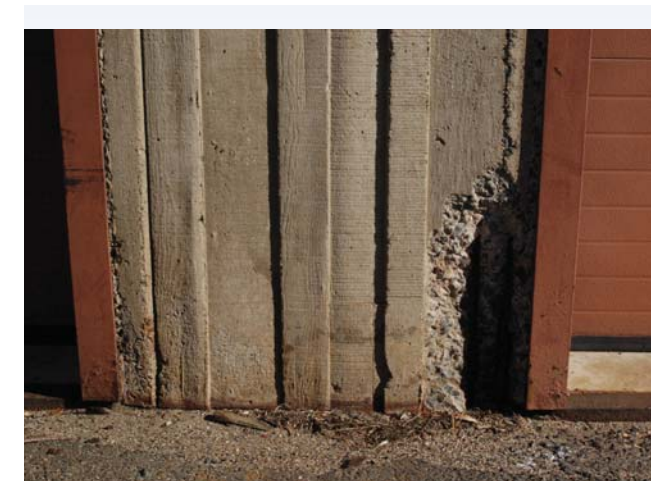
Photograph P12

Review of the structural drawings reveals that the reinforcing bar sizes, spacing, and distribution for the typical building bays is the same as used in the bays adjacent to the expansion joints. The amount of bottom reinforcing steel, mid-span, on each side of the joint does not increase, as would be structurally expected adjacent to an expansion joint, or “pinned” condition. Similarly, the plans show the reinforcing as if it were continuous over the expansion joint, but the expansion joint details clearly indicates that reinforcing is interrupted by the joints.

This observation prompted us to perform some very preliminary calculations for the elevated floor in these framing bays, in order to provide a basic understanding of the conditions. Based on these preliminary calculations, we believe that portions of the elevated floors are likely to have live load capacities less than the 100 PSF indicated in the drawings.

In our opinion, the excessive deflection appears to be a combination of elastic deflection due to the slab thickness given the pinned condition; and plastic deformation, or creep, due to under-reinforcement of the slab. This condition will require a more in-depth study by a qualified structural engineer, in order to determine actual live load capacity, and to establish if the available load capacity is sufficient to satisfy code required minimums.

If as a result of this in-depth study, it is determined that strengthening of the structure in the four bays affected by this condition, it is likely that the slab would have to be strengthened by the addition of steel beams and columns underneath the slab. Additional columns would be added to shorten the slab spans and beams would be added to stiffen and strengthen the existing slab. The upper surface could then be made level with a self-leveling cementitious topping material.



Photograph P4



Photograph P5



Photograph P6

Photograph P7

MECHANICAL/ ELECTRICAL

Mechanical System

The first floor is air-conditioned by two constant volume, direct expansion, split system air handling units (AHU-1 & AHU-2) sized at 33,000 and 35,400 CFM respectively located in the first floor mechanical equipment room. The four air-cooled condensing units that are piped to AHU-1 and AHU-2 are located on the roof. The refrigerant compressors in the condensing units have failed and have been replaced with the compressors (four for each AHU), which are now installed next to the air handling units within the mechanical equipment room. There is no means of control for the air being supplied or the space temperatures in the individual classrooms or offices. Air is being supplied to the spaces through metal ductwork directly to ceiling diffusers or registers.

The second floor is similarly air-conditioned as the first floor by AHU-3 and AHU-4 sized at 33,000 CFM each located in the second floor mechanical equipment room. The condensing units serving these units are also located on the roof. Outside air is being introduced into the air-handling units at approximately 14.2% of the total supply air. Relief air is exiting the building through four roof mounted louvered penthouses.

The remnants of the original pneumatic control system are still in place and appear to be serving a portion of the controlled components. However, a portion of the controls have been replaced with new direct digital controls. While the air compressor was functional at the time of this site visit, it does not appear that the control system is functioning in an efficient manner.

It appears that the majority of the air-conditioning system is original equipment installed when the building was first constructed in mid-1970s. The air handling unit casing are in poor condition. Many of them show signs of collapse through structural failure or excessive pressurization. The

Structural Recommendations

Exterior Concrete Repairs (Photographs P1 through P9) :

Remove loose, delaminated, and spalled concrete from sporadic locations around the perimeter of the building by chipping. Wire brush or machine clean exposed and corroded reinforcing steel, and paint exposed reinforcing steel with zinc rich primer.

Patch prepared repair areas with two-part, polymer-modified cementitious patching mortar. We estimate 40 instances of 5 square feet, uniformly distributed around the exterior of the building, for a total of 200 square feet.

Structural Review of Existing Elevated Floor (Photographs P10 through P12) :

Engage a qualified structural engineer to perform a thorough engineering analysis on the entire elevated structure to determine the actual floor and roof loading capacities, and establish if the building satisfies the minimum loading criteria required by building code.

If found to be deficient, add a single line steel columns and beams at mid-span of each of the four bays (each side of the expansion joints). Columns will extend two-stories to the underside of the roof and will bear on new concrete spread footings constructed beneath the grade slab.

Portions of the grade slab must be removed and replaced in order to install these footings. We estimate W12 steel columns on the column on the same spacing as the 18" concrete columns, heavy W18 steel beams, and 8 foot square by 20 inch thick concrete footings.



Roof Top Mechanical Equipment



Roof Top Mechanical Equipment



Roof Top Mechanical Equipment



Mechanical Room - Interior



access doors have visible air gaps when closed. The roof mounted condensing units are in poor condition. The existing cooling system appears to be in poor condition, well beyond its intended service life, not energy efficient, and incapable of providing appropriate levels of zone temperature control to meet present educational requirements. The outside air levels are also well below the levels expected to meet present building codes.

A new Carrier air-cooled water chiller is also located on the roof and was described by building personnel as serving the TV studio. Ventilation of various spaces requiring direct exhaust is being accomplished through roof mounted power ventilators. Heating along the front of the building is being accomplished through electrical radiation heaters located in the ceiling or walls.

During the visit, none of the air handling units serving the first and second floors were operating and consequently no ventilation air was being introduced into the building. Additionally, many of the compressors were in the process of being replaced. The condensing units on the roof are in poor condition.



Generator

Electrical System

Two switchboards supply power to the existing school. Switchboard 1 is 3000A, 208/120V, three-phase. Switchboard 2 is 4000A, 480/277V, three-phase. There is an emergency back-up generator that seems to have been recently installed and in good condition. There are circuit breaker type electrical panels inside mechanical/electrical rooms throughout the school. Some of the panels appear to be old and overloaded.

The lighting in the building is poor and not efficient. The existing fire alarm system includes a Simplex fire alarm control panel; annunciator panel, strobes, bells and manual pull stations. Only a portion of the building is covered with strobes and bells. The pull stations are located at the exits of the building. The existing power, telecommunications, and associated conduits are all surface mounted on the walls.



Electrical Service

Plumbing & Fire Sprinkler Systems

A 3-inch water service enters through the east face of the building. There is no visible means of backflow prevention at the service entrance to the building. Domestic hot water is being provided through a recently installed, 120 KW electric heat exchanger on the second floor. An 8-inch sanitary sewer main exits the building below the east face. A grease interceptor is located underground on the south side of the building to treat



Electrical Panels

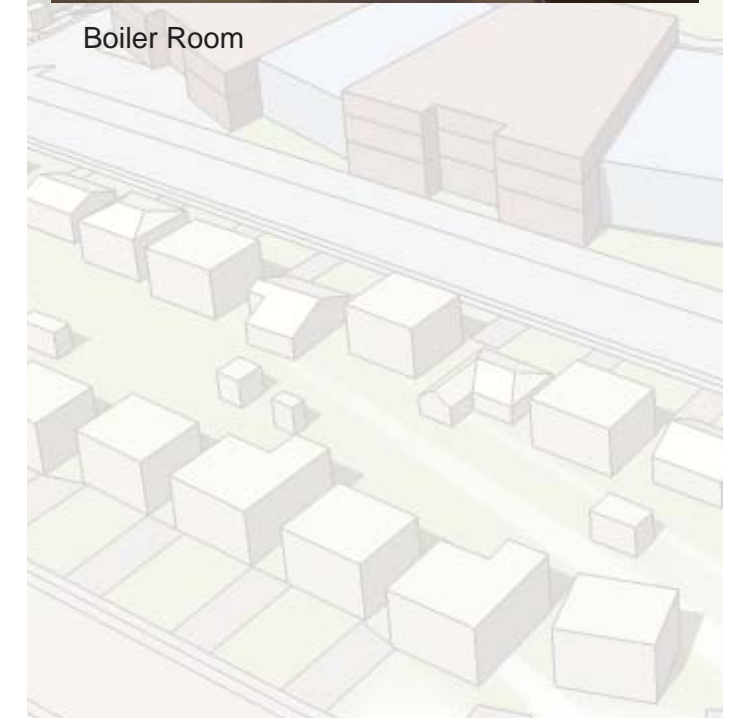
sanitary waste from the automotive shops prior to discharging to the sewer system. There does not appear to be a grease interceptor associated with the sanitary systems serving the kitchen.

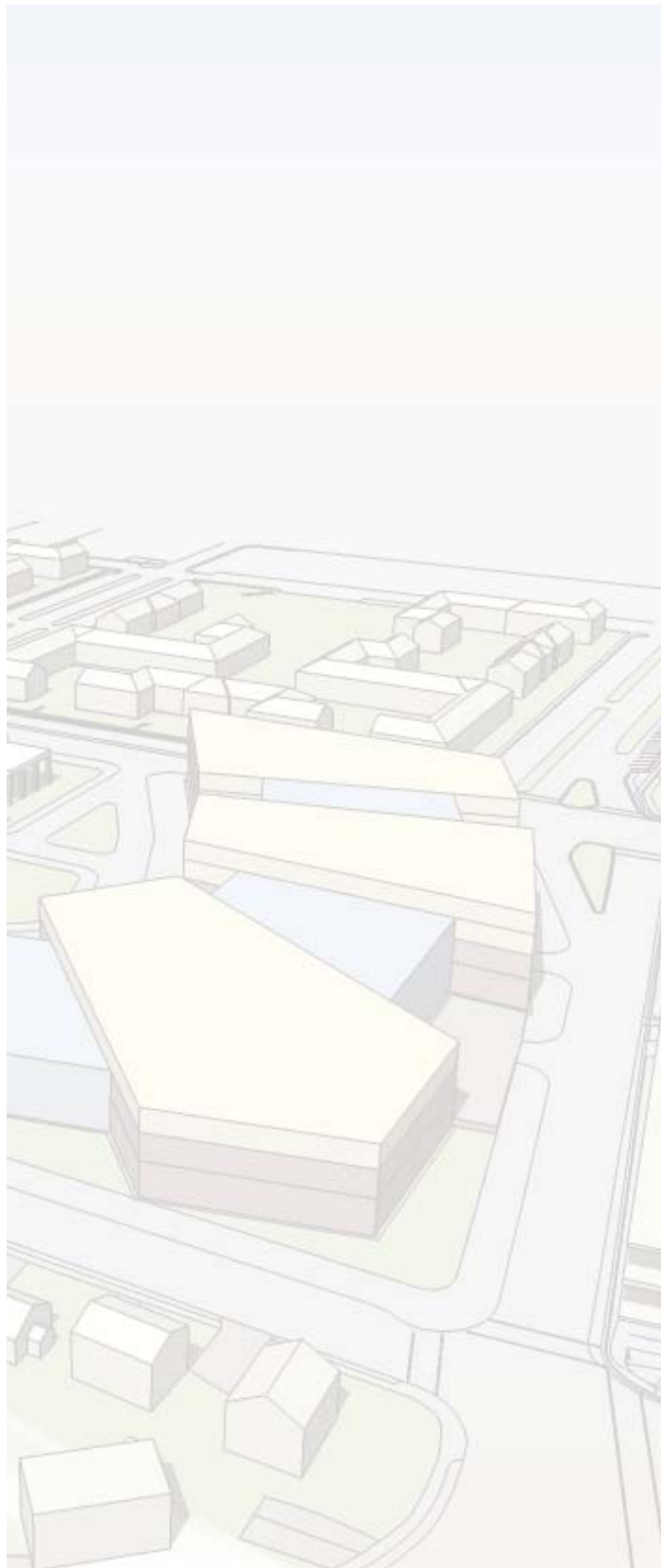
Rain water is collected from the roof drains and run through internal rain leaders to two 15-inch storm sewer mains that exit the building beneath the south face.

A natural gas meter is located on the south face of the building. A 4-inch gas line enters the building and distributes gas to various fuel burning appliances within the building.



Boiler Room





An air compressor located near the southwest corner of the building provides shop air to the automotive shops.

A Siamese connection of the north face of the building serves a dry standpipe system located in the stairwells on the north side of the building. An 8-inch fire service entering near the southeast corner of the building serves a wet pipe sprinkler system covering the shop areas along the south side of the building on the first floor.



Electrical Service



Electrical Equipment

Recommendations

A completely new heating, ventilation, and air-conditioning with appropriate building and zone control is required. The new system will provide appropriate ventilation and filtration for the health of the building occupants, and appropriate energy conservation features for the benefit of the County in accordance with current energy code standards. In general, the system has exceeded its expected useful life and will need more and more maintenance. Despite ongoing maintenance, it will continue to perform below expected minimum standards.

It is recommended to update the electrical system to comply with current building and electrical codes since most of the equipment is from the original construction of the building. The generator can be salvaged and reused but it is recommended that it be tested to the NFPA 110 standards. The fire alarm system must be upgraded and applied throughout the building. The conduits, power receptacles and telecommunication junction boxes should be replaced and installed inside the walls. The lighting should be replaced and upgraded to comply with the energy code. While the electrical systems will require far less ongoing maintenance, the sub-standard (by today's standards) lighting levels and efficiency of the lighting and power systems represent a significant ongoing cost and impediment to the effectiveness of the facility for its intended use.

A completely new plumbing system is required including water saving fixtures and new waste, vent, and water distribution throughout the building. The plumbing system has exceeded its intended service life, which will increasingly result in maintenance and serviceability issues and cost. Further, the lack of modern and highly efficient lavatories, waterclosets, and fixtures represents a significant ongoing cost in water and sewerage. Modern fixtures save money and conserve resources.

Given that the sprinkler system in the facility

is limited, we recommend that a new, wet pipe sprinkler system should be installed throughout the building. While a sprinkler system throughout the facility is not dictated by code, it is a safety precaution mandated for all new schools and represents a significant benefit to the occupants and users of the facility. Retrofitting a new system in the existing building would be cost-prohibited and may not even be possible, given the low floor-to-floor heights and existing systems.



THE EDUCATIONAL SPECIFICATIONS

INTRODUCTION

A planning and programming effort was begun in order to understand and quantify the needs of the existing programs, as they related to the renovation and renewal of the Career Center.

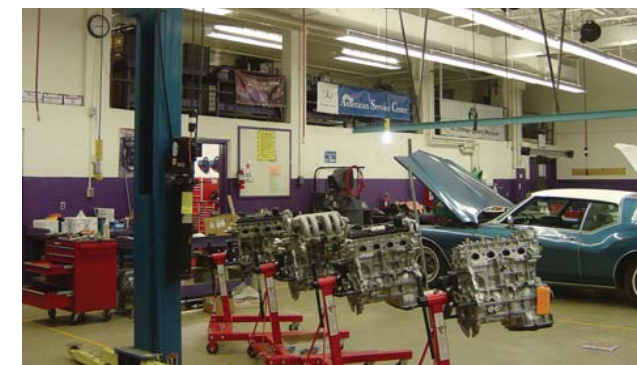
In addition, APS established an Educational Design Team composed of teachers, administrators, counselors, the architectural design team and its educational planning consultant. The Educational Design Team, lead by APS staff, conducted a comprehensive discussion of curriculum, needs, goals, and principles for implementing the CTE/STEM initiative. It addressed the consolidation and co-location of the High School Continuation Programs and integration of higher education opportunities.

EXISTING PROGRAM

The Arlington Career Center offers vocational, technical, academic and enrichment programs to high school, middle school, elementary and adult students Monday through Saturday, during the school year, and again during a six-week summer enrichment session. The Career Center works in close collaboration with all of Arlington's schools and alternative programs providing a variety of elective courses in the CTAE fields.

The Career Center prepares students to realize their potential in a changing technological society. The program helps students develop the skills, knowledge and attitudes that encourage them to become lifelong learners through a collaborative learning environment that promotes individual growth and builds upon each student's strengths, abilities and career interests.

The Career Center is an integral part of the program of studies conducted at each of Arlington's high schools. Career Center courses supplement and enrich the Arlington Public Schools' existing educational programs. The wide variety of curriculum offerings support the state standard and advanced studies diplomas. Both the skills and academic programs prepare students to continue their formal education or enter the labor market directly after high school. Approximately sixty percent of Career Center students continue their education at colleges, universities, trade schools and technical institutes.



Automobile Technology



Animal Science



Aeronautics

EXISTING PROGRAMS AND USES



HIGH SCHOOL CONTINUATION

Arlington currently divides its High School Continuation population between the Langston-Brown building in North Arlington and the Arlington Mill building in South Arlington. The students are often older and have life experiences more complex than the typical high school student, although their aspirations are often similar and their academic needs comparable. The divided population means that it is often difficult to have a critical mass at either site to make possible some advanced classes from which the students would benefit.



Arlington Mill

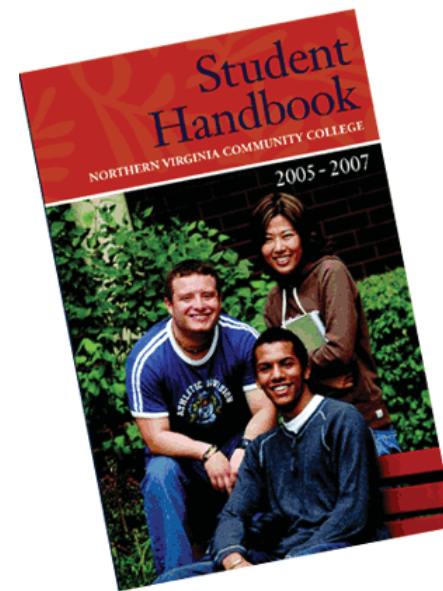


Langston Brown



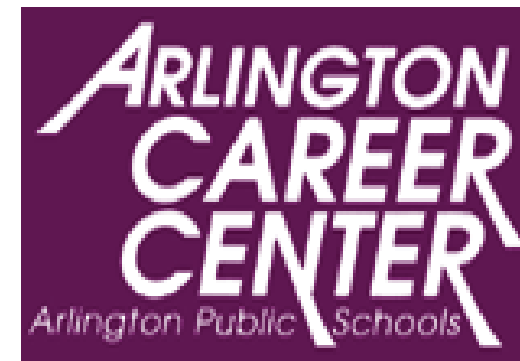
HIGHER EDUCATION

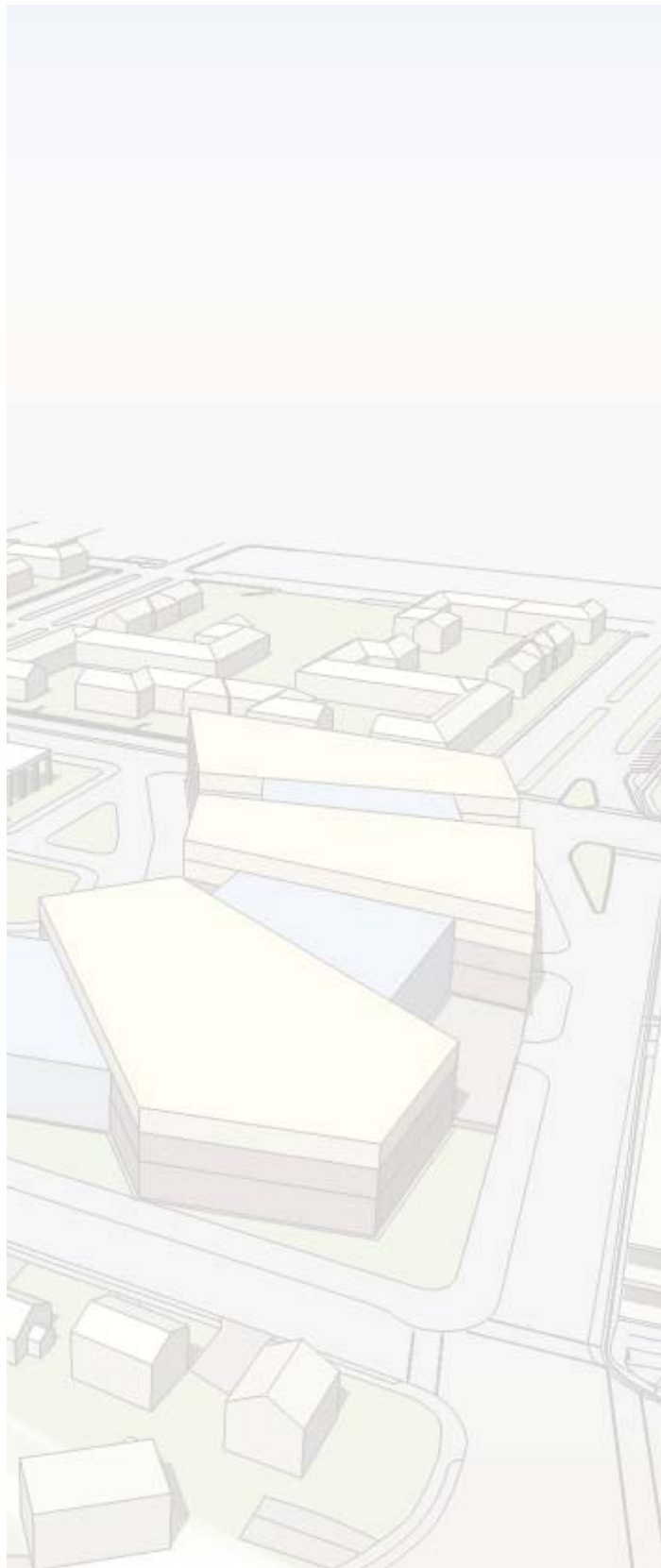
Arlington has forged close links with Northern Virginia Community College (NVCC) and other institutions of post-secondary education. The Office of Career, Adult, and Technical Education and the Office of Foreign Languages in the Department of Instruction have been especially successful in working with NVCC. Several schools cooperate with George Mason and James Madison Universities, for example. Students have the ability to enroll in a variety of post-secondary courses, ranging from technical subjects to Mandarin Chinese. The Career Center's cooperation with the GMU Early Identification Program is long-standing.



NVCC: Fast Facts

- 2nd largest multi-campus community college in US
- > 60,000 enrollments, 22,000 FTEs/yr.
- Currently offer 100+ ALN courses





CTE/STEM

Science, Technology, Engineering, and Math (CTE/STEM) education is acknowledged as one of the most advantageous paths for students in the 21st century. In a world fueled by innovation, these fields have driven significant creative and innovative growth over the past several decades. From CTE/STEM cell research to computer programming, there is an abundance of career choices in high demand.

CTE/STEM education is not only a change in subject matter, but a new philosophy of instructional delivery. The goal of CTE/STEM education is for students to learn subject matter through discovery, analysis, and research rather than the traditional style of lecture and recitation. Students are typically offered a well-rounded course-load that includes English/Literature, History, World Language and Physical Education along with an emphasis on project-based CTE/STEM courses such as Chemistry, Physics, Calculus and applied problem solving in engineering, biotechnology, or networking.

The objective is to ensure that every student is equipped with the knowledge base and skill-set necessary for both a career and postsecondary education at the time of high school graduation. Advanced courses can help students receive college credit during their 11th and 12th grade years. This can be especially beneficial to students who may not otherwise have the financial means to gain access to these courses. Having a well-defined partnership with local community colleges and universities can be extremely beneficial for high school students in this period of transition.

Through involvement in research experiences, being exposed to various CTE/STEM career paths, taking math courses that are college preparatory or for college credit, and becoming familiar with current technology, students' educational/career opportunities are dramatically enhanced.



ASSUMPTIONS

The Career Center is an extraordinary resource that is often underused due to scheduling and transportation issues as well as insufficient information about its mission and target population. Although the Career Center attracts several hundred students each year, many more students who could benefit from its offerings are prevented from doing so.

Nationally, the model of a Career Center to which students are bused for part of the day is no longer considered an attractive alternative. Increasingly, school districts are moving toward more comprehensive models where students can complete most of their basic educational courses as well as their technology and applied education courses at the same facility. In part, these decisions depend on logistical considerations related to lost student time and costs of busing, and in part this changed perspective is the result of concerns about the cohesiveness of different programs at different sites.

The kinds of courses offered in the area of career and technical education have moved beyond those that provide lower entry level skills. Today's technology and applied education focuses on career paths that rely on competencies requiring external licenses and preparation for further education. In other words, Arlington's educational offerings should focus on skills, understandings and dispositions that lead to well paying careers and that prepare our students for lifelong learning.



Guiding Principles

Provide small learning communities that lead to a nurturing, supportive environment for learning



Commit totally to success for all its students



Ensure support beyond academics for all its students



Provide flexibility in scheduling

