3.3.4 PREFERRED SOLUTION

A. Updated Educational Program
B. Updated Space Summary *
C. Sustainable Design
D. Building Floor Plans *
E. Site Plan *
F. Budget Statement for Preferred Solution *
G. Updated Project Schedule *
H. Supporting Documents

*** Updated 02/18/2020**

3.3.4 PREFERRED SOLUTION

A. Updated Educational Program

1. Updated Educational Program (redlined)
2. Updated Educational Program with Designer Responses (clean copy)
3. MA DESE Letter Regarding Chapter 74 Programs
4. Updated Adjacency Diagrams

DOHERTY MEMORIAL HIGH SCHOOL
Worcester Public Schools
EDUCATIONAL PROGRAM

Feasibility Study for submission to the Massachusetts School Building Authority
September 2019

PSR Redline Copy: December 2019

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Introduction

Doherty Memorial High School (DMHS) is a community of learners committed to working together to develop the mindset and the skills necessary for all students to become college and career ready, and lifelong learners. The school empowers students to become critical and independent thinkers while fostering creativity and a growth mindset that supports the belief that all students can succeed. Doherty Memorial High School engages families, students, staff, and community members to work collaboratively to ensure the success of all members of the Doherty school community.

The students, staff and family have a sense of pride in the school as is evidenced by the enthusiastic and continued support of its academic and extracurricular activities. In the 2011 Decennial Report, the New England Association of Schools and Colleges (NEASC) noted in its accreditation report that the students have a sense of pride in their school. They are happy to be there each day and they feel safe and secure. This school pride can be seen as they cheer for each other on the playing field, on the stage, in their classrooms, and in our community. *Doherty Pride* is more than just a slogan at the school, it is something than can be witnessed in the care they show for each other, stepping up to assist a classmate in need or organizing a school-wide rally for Stand for the Silent, or the care they take in making the aging facility a home as they use their artistic talents to paint murals on the walls or decorate a classroom.

Doherty Pride is visible among the staff as well. Currently, 30 staff members are Doherty alumni, fifteen have had their children or relatives attend the school, and six currently have students attending or will attend the school next year. This adds to the sense of community that is present in the school and demonstrates a level of commitment to the core values that guide the work and support our students. As we began this phase of our journey towards planning a new building, faculty members were asked to share their opinions and their hopes for our students in a new building. A survey was distributed to the faculty had an 85% return/participation rate and yielded valuable information to guide us in the writing of this report. Many shared their excitement for being able to provide a more modern facility with state-of-the art technology to prepare our students to succeed in the twenty-first century. Teachers shared their ideas and their hopes for the school and for our students at faculty meetings, on surveys and many volunteered their time after school and during the summer to participate in the visioning process. This is just one way that they demonstrate their commitment to our students and their pride in our school and its programs.

The school is an integral part of the neighborhood and has long been supported by the community. Students are actively involved in our local community and partner with local agencies and business through internship programs. Each year over 70 local community members volunteer their time as Career Day speakers and share their career paths with our students. As a result, many speakers have opened their businesses to our student interns and volunteer to come back each year to work with our students as speakers, as AVID tutors, and as supporters of our performing arts and sports programs.

Doherty Memorial High School is located at 299 Highland Street, Worcester, MA and in the 2018-19 school year, DMHS had 1,529 students in grades nine through twelve. Opening its doors in fall 1966, the school was originally built to house students in grades ten through twelve. The school population increased with the inclusion of Grade 9 in 1983 and its student enrollment has been growing steadily since then.

Located on the west side of the city, the student body represents a cross-section of the local community. The school offers a range of academic and extra-curricular programs to serve its body of diverse student learners.

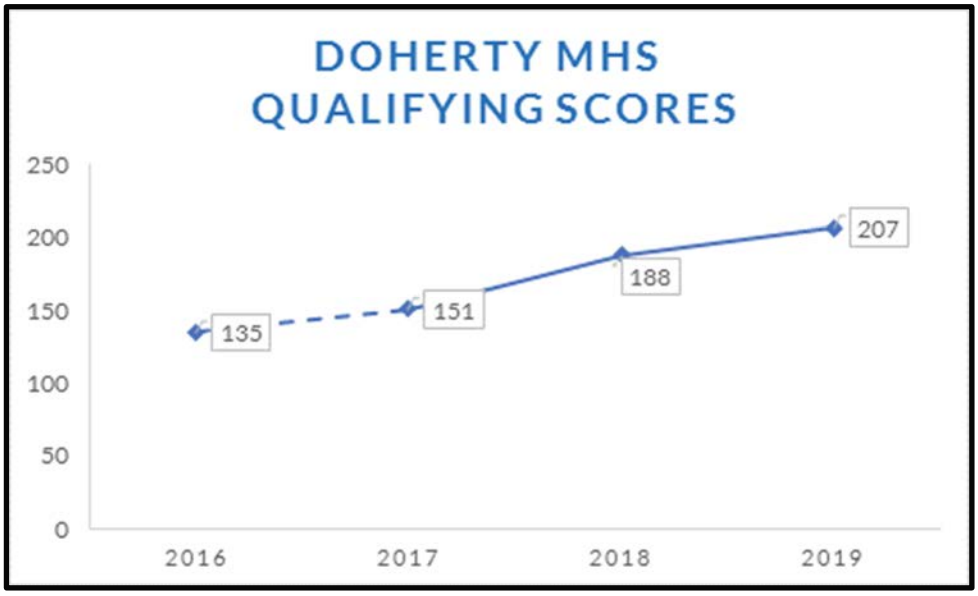
Table 1

Year: (As of October 1st each year)	Students	Female	Male	Asian	African American	Hispanic	Native American	White	Low Income	English Language Learners	Special Ed
2018-19	1529	708	816	115	298	469	16	627	763	285	230
2017-18	1544	709	835	141	292	635	16	460	724	300	252
2016-17	1553	708	845	147	284	485	14	623	729	354	257
2015-16	1467	686	781	157	246	443	15	606	591	259	218
2014-15	1428	689	739	159	244	421	~~587~~17	~~587~~17	835	279	214

Academic success and college and career readiness are the cornerstones on which Doherty Memorial High School's foundation of learning is built. The breadth of course offerings and the rigor of course content prepares students for post-secondary success. The school offers a range of courses to meet both student needs and student interest including 22 Advanced Placement courses in the humanities, and math and sciences, an Engineering and Technology Academy (ETA), visual and performing arts, world languages, Career Pathways program, as well as college and career preparatory courses at multiple levels. The curriculum is purposefully designed and adheres to the Worcester Public Schools (WPS) curriculum which aligns with the Massachusetts Department of Elementary and Secondary Education's Mass Core curriculum frameworks.

Students challenge themselves through participation in a variety of courses at every level. Students who participate in the Advanced Placement courses challenge themselves to engage in advanced-level course work and earn college credit based on qualifying scores on the AP exams. In 2019, students in AP courses at Doherty Memorial High School achieved 207 qualifying scores an increase from 151 qualifying scores prior to 2017.

Figure 1



(Mass. Insight Education & Research)

Other students challenge themselves by participating in Early College High School classes. Beginning in 2019-20, Doherty Memorial High School will be able to expand this opportunity by offering college courses on the Doherty campus, in partnership with Worcester State University and Quinsigamond Community College.

Course work at all-levels challenges students to engage in higher-order thinking and to apply these skills to authentic learning opportunities. The collaborative skills supported through these courses provide valuable tools for our students as they prepare to engage in a global economy and the world around them. Students apply these transferable skills to not only their class work but to opportunities that arise in the community through partnership and internship opportunities.

Doherty Memorial High School has a long tradition of academic excellence and many of its graduates go on to pursue their post-secondary education at a variety of colleges and universities located across the nation. Others further their education through training programs and enter the workforce or the military. Members of the class of 2019 were accepted to 188 different colleges and universities including: Assumption College, Becker College, Boston University, Brandeis University, Brown University, Clark University, College of the Holy Cross, George Washington University, Harvard University, Massachusetts College of Art and Design, Massachusetts College of Pharmacy, Morehouse College, Quinsigamond Community College, University of Oregon, University of San Diego, University of Massachusetts, Worcester Polytechnic Institute, and Worcester State University. The school profile for the class of 2018, with 376 members, shows that 87.4% of the students went onto some type of postsecondary schooling. More specifically, 54% to four-year college, 33% to two-year college, 0.4% to postsecondary and trade school, 8% to work, 2.4 % to the military, and 0.2% to other.

Student growth and their ability to make progress is essential for them to succeed and be college and career ready. John Hattie's research provides insight into what makes a visible difference in student learning. Hattie identifies a hinge point, something that will provide a year's academic growth within a year's time. He determined that anything with a 0.40 or greater effect size will provide such positive growth for students (DeWitt, 2014). The teachers' self-efficacy, the belief that they can positively affect growth in their students supports the school's mission to create life-long learners and enhances the sense of community that is present in their day-to-day work.

While our students have been successful both during their academic career while at Doherty and in their post-secondary education and career paths, there is a need to expand our offerings to meet changing student needs and to better prepare our students to be capable and contributing community members who can make a positive difference in our global community. This can be done by expanding our current programs, adding additional career pathways and providing our students with increased opportunities that reflect the global society in which they will interact. Doherty Memorial High School needs additional space in the physical plant in order to offer programs to meet the needs of our students. When we welcome families and students to our school, we feel that they are joining our Doherty family and we await the opportunity to have our family reside in a building that effectively meets the needs of our family and that provides the 21st century learning environment that the Doherty family and our community needs and deserves.

As part of the New England Association of Schools and Colleges (NEASC) Decennial visit in 2011, the commission cited several commendations including: the school pride amongst faculty and students, the strong relationships within the community including local businesses, colleges and universities, the development of measurable academic, civic, and social expectations, the caring and unified faculty willing to maintain a positive attitude toward teaching and in spite of working in an inadequate facility, the safe, positive, and respectful school culture, the open access philosophy encouraging all students to take advanced placement courses, efforts by staff to build connections with students, the willingness of the principal to share leadership with faculty members and the willingness of faculty members to take on leadership roles including as providers of professional development, the identification and support of at-risk students and communication between support services staff members and families, and the onsite health center which provides students with preventative and wellness care. The commission also cited recommendations and expressed some concerns largely focused on the building. These included: ensuring equal access to programs and services in all parts of the building for all students and staff members including handicapped access to programs and services on all levels, ensuring sufficient levels of staffing, instructional materials, technology, equipment, supplies, facilities and library/media resources to fully implement the curriculum, immediately addressing all health and safety issues within the facility including safe chemical storage, making repairs to windows, doors, water fountains, shower facilities in the locker rooms, and plumbing, lavatories and ventilation in lavatories, providing adequate heating and ventilation throughout the facility, providing adequate seating in the cafeteria so that all students may sit down to eat, and providing science laboratory facilities to all implementation of the science curriculum. Doherty Memorial High School remains on warning status due to the facility although the commission is pleased that we have been accepted to participate in this Feasibility Study and we are grateful to the MSBA for allowing us to engage in this process.

As a part of the Feasibility Study phase of the process, members of the Doherty Memorial High School community conducted a comprehensive review of the guiding documents and engaged in a number of activities in order to reflect upon our current programming and to recommend revisions/additions to our current programming to inform and guide our plans for the future. In addition to reviewing and referencing the NEASC Decennial report of 2011, and our District/ School Improvement Plans, another guiding document for this work included *Defining Our Path: A Strategic Plan for Education in Worcester 2018-2023*. The report was written in collaboration with the superintendent and several members of our community and organizations including the Worcester Education Collaborative, the Worcester Regional Research Bureau and the Rennie Center with support from the Barr Foundation, the George I. Alden Trust, and the Greater Worcester Community Foundation. There were multiple committees and subcommittees and the members of these groups gathered input from focus groups including educators, families, students, and community members. The focus areas of this strategic plan include: Culture of

Innovation, Academic Excellence, Welcoming Schools, Investments in Educators, and Technology and Operations. The goals of the Strategic Plan and the goals of our district and school level initiatives have been woven throughout our Feasibility Study and Educational Programming Development process for our vision of the new facility and the focus on 21st century skill development.

Another integral part of this phase of the project included members of our community participating in several Educational Visioning and Programming sessions with David Stephen of New Vista Design and the team of architects from Lamoureux, Pagano and Associates (LPA) as part of our Feasibility Study.

A summary of the Visioning Sessions and Responses is included below.

During the month of June 2019, the Doherty Memorial High School Educational Working Group (EWG), a group of approximately 20-25 Worcester Public Schools administrative leaders, teachers, parents, and community partners, participated in three Educational Visioning Workshops run by New Vista Design and LPA Architects. Each workshop was a collaborative session designed to inform the Doherty Memorial High School Feasibility Study and design process. Participants were led through a step-by-step visioning process aimed at capturing their thinking about Worcester Public School's current and future educational goals and priorities and connecting them to best practices and possibilities in innovative school facility design. Additionally, a Faculty Visioning Workshop was held on June 3, 2019 in which the entire faculty of Doherty Memorial High School met to offer feedback on their educational and architectural priorities and goals, and a Community Visioning Workshop was held on the evening of June 24, 2019 to share priorities established by the EWG and ask for feedback from the larger Doherty Memorial High School community.

On **June 3, 2019** the entire faculty of Doherty Memorial High School participated in a one-and-a-half-hour Educational Visioning Workshop that explored the following topics:

- ***Priority Goals*** for the renovated and/or new DMHS educational program and facility
- Visions for the Future of DMHS's academic and extra-curricular programming

On **June 5, 2019**, the Doherty Memorial High School EWG participated in Educational Visioning Workshop One. The four-hour workshop explored the following topics:

- ***Priority Goals*** for the renovated and/or new DMHS educational program and facility

- ***21st century teaching and learning practices*** as connected to Worcester Public School's present and future educational vision
- ***Strengths, Challenges, Opportunities, and Goals (SCOG Analysis)*** associated with Worcester Public School's current academic programs as well as the vision for its renovated and/or new facility
- ***21st Century Learning Goals*** that distill the group's best thinking with regard to Worcester Public School's current and future educational programming and priorities

On **June 17, 2019** the Doherty Memorial High School EWG participated in Educational Visioning Workshop Two. The four-hour workshop explored the following topics:

- ***21st Century Design Patterns 1.0*** that participants would like to see employed within the renovated and/or new DMHS facility
- ***Guiding Principles*** and priorities for design of the renovated and/or new DMHS facility

On **June 24, 2019** the Doherty Memorial High School EWG participated in Educational Visioning Workshop Three. The four-hour workshop explored the following topics:

- ***Blue Sky Ideas*** for the renovated and/or new DMHS facility
- ***Key Spaces and Adjacencies*** for the renovated and/or new DMHS facility
- ***Bubble and Adjacency Diagramming*** for the renovated and/or new DMHS facility

On **June 24, 2019** an evening Community Visioning Workshop was help, that explored the following topics:

- ***Timeline and Tasks*** connected to the MSBA Feasibility Study for the renovated and/or new DMHS facility
- ***Educational and Architectural Priorities*** that the DMHS EWG had determined for the renovated and/or new DMHS facility

Each workshop generated ideas, goals, and aspirations, and identified urgent needs, critical infrastructures, etc. from the perspective of school and community stakeholders. This input helped shape the design proposal by providing information about the following areas: the physical layout and space adjacencies; expanding current educational programs to better serve students; increasing community access so that the school's resources and features are available beyond the school day; creating flexible space so that in the coming decades all students graduate with appropriate college and career readiness skills; increasing educational programming opportunities to address the needs of the students and the community.

In May 2019, Doherty Memorial High School staff members completed an online introductory survey. This tool asked participants to reflect and identify current features and practices that excite and motivate the school community, but then also asked respondents to look to the future and highlight their aspirations for the school. Finally, staff members were asked to think about the end result of this design process and to review a list of sample visionary goals in order to select one or more goals that they identified to be the most important and impactful on the stakeholders. For example, one respondent identified the importance of collaboration, and the opportunities available in a newly designed space with this still in mind:

> *I am excited about using different ways for students to collaborate both face-to-face and online.*
>
> *(In the future…) I would like to see more space for collaboration and more flexible space that can easily be adapted as our needs change throughout the school year as well as over the years. I would like to be able to have large spaces available for big groups to work together as well as small study areas for groups to meet with teachers. I would like to continue to expand the use of technology and to expand the media center to provide the students more of a collegiate experience for research.*

Another educator's goals were related to the goal of increasing interdisciplinary connections within their curriculum:

> *I am excited about all the available technology that benefits students learning English as A second language.*
>
> *(In the future…) I am excited about the available technology and project-based learning that integrates knowledge and skills from different content areas that students need to apply in their own student-led learning in order to tackle a real-world problem.*

On June 3, 2019, with the survey results as a catalyst for conversation, the entire faculty of Doherty Memorial High School participated in an Educational Visioning Workshop that explored their priority goals for the renovated and/or new Doherty Memorial High School educational program and facility, as well as their visions for the future of DMHS educational program and facility. The conversations and products from this session was grouped thematically and highlight the faculty's visions for the future.

Table 2

ACADEMIC PRIORITY	NUMBER OF VOTES

Core Values	30
Differentiated Instruction	22
Team Teaching	25
Cross Discipline Instruction	22
Student-Centered Learning	32
Social Emotional Learning	25
Professional Learning Communities	16
Technology Integration	45
Real World Connections	51
Service Learning	16
Internships and Field Studies	27
Community Service	23
Flexibility & Adaptability	22
Diverse Educational Opportunities	31
Career Pathways	28
Hands on / Project-based learning	32
STEM and STEAM	21
9th Grade Teams/Transition Support	29
Sustainability / Connections with Park	4

Faculty and community stakeholder input has guided the careful reflection of the current, and desired, educational programming and space design features within a modernized and purposefully planned space. For example, all stakeholders emphasized career pathways, which included desires for courses and programs of study that would better expose students to a variety of career options and help them develop skills and content knowledge. In addition, these career pathways would align with the needs and interests of underrepresented populations, and/or identify and implement programs for which there is a demonstrated student interest and need. With student survey data from Naviance, a comprehensive college and career readiness platform, relating to career interests, local, regional and national labor market analyses, and from a review of currently available local and area schools and training programs, Doherty Memorial High

School identified three additional Chapter 74 Career Vocational Technical Education programs that are included in this proposal.

Conversations have continued with members of LPA through July and August with input from school, district, and community stakeholders. Most recently, we participated in school visits to the following recent MSBA projects:

- West Bridgewater Middle High School; Grades 7-12, enrollment 619
- Billerica Memorial High School; grades 9-12, enrollment 1,610
- Dearborn STEM Academy; grades 6-12, enrollment 600

The lessons learned, the relationships developed, and the information gained during these visits have proven to be invaluable and have been incorporated into our educational visioning and programming as well as the overall design for the school. We are eternally grateful to the teams of people at each of these schools for their willingness to host our team and to share their insights and experiences. It is our hope, upon completion of our project, to be able to host teams from other schools that are engaged in this process. We are pleased to be working collaboratively with members of our community and with the MSBA in order to provide our students with the best educational program in a facility that supports teaching and learning for all.

A. Grade Configuration

Doherty Memorial High School currently serves students in grades 9-12 and the vision for the new school is to continue this grade configuration. The vision for the new school includes the addition of ninth grade academies designed to provide targeted supports to assist students in the transition from middle school to high school and to prepare them to be on track for graduation and college and career ready.

Ninth-Grade Academy/Teaming

Ninth grade and its associated transition to high school is often considered to be one of the most pivotal years in a student's academic career. Many students struggle with the change of schedule/start time, the challenge of working with new and unfamiliar teachers, and the changes within their peer group coupled with the changes associated with this stage in their physical, emotional, and social development. The challenge of a new school environment can lead to increased stress and contribute to academic, social, and behavior problems for some students.

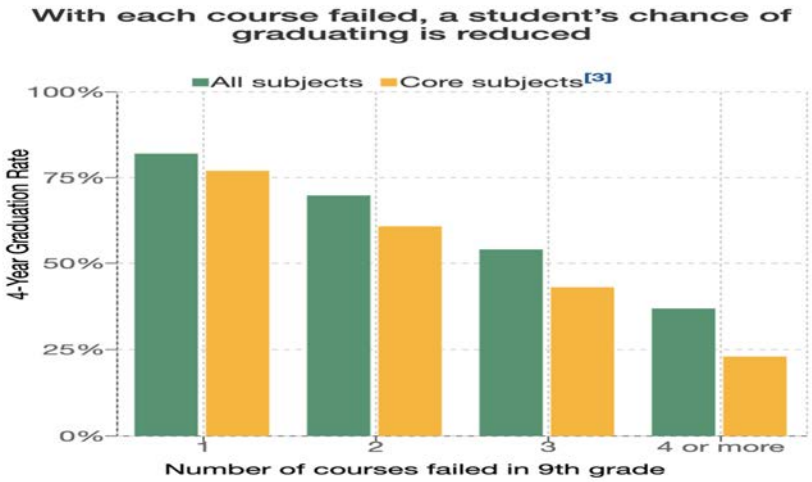
Neild's (2009) research indicates:

> "Transitions in schooling are moments of great promise for children, holding the potential for personal growth, new learning, and greater independence and responsibility...Students who do not navigate a school transition well face the possibility of personal and academic turmoil and even falling off track for promotion and graduation. The entrance to ninth grade marks one such critical juncture in American schooling" (p.53).

The majority of the ninth-grade students transition from Forest Grove Middle School, Doherty's primary feeder school. Each year, additional students enroll having completed the eighth grade in a private school, a school outside of the district, or a different Worcester Public Schools' middle school (special permission). Ninth and tenth grade students in the Engineering and Technology Academy (ETA) are placed in a grade-specific team where they share the same core academic teachers. At present, this is the only Grade 9 team that is available to students.

Research indicates students who have experienced even a moderate level of difficulty in middle school are at a greater risk for not succeeding during the transition to high school (Neild, Balfanz & Herzog, 2007). Students who struggle in ninth grade may have to repeat courses, placing them off-track for graduation in four years with their cohort of peers. Data from the Massachusetts Department of Elementary and Secondary Education (DESE) indicates that 96% of students who pass all of their ninth-grade courses will graduate in four years. That number drops significantly as only 64% of students who failed at least one ninth-grade course graduate in four years. (Https://abcs.sites.digital.mass.gov/)

Figure 2



https://abcs.sites.digital.mass.gov/data/9/grade_9_data_viz2.csv

Statistics such as this indicate the need for ongoing, targeted support and a need for a change in programming to support ninth grade students. The recognition that laying a strong academic foundation to support ninth-grade students to be college and career ready and to graduate with their cohort of peers within four years, coupled with the ever-growing concern for reducing the number of ninth-grade students who fail classes, drives the desire to seek additional support for ninth-grade students.

We currently offer several programs to support students' transition to Grade 9. These programs include a fall Open House for students and families, outreach to middle school students to help students plan for course selection, an outreach program for parents to provide course information, a parent orientation prior to the start of the school year, and a two-day Jumpstart program prior to the start of school to support students and prepare them to have a successful start to ninth grade. While these supports are beneficial to students there is a demonstrated need for additional supports for ninth grade students.

Presently, ninth-grade students at DMHS attend classes that are scheduled in classrooms in areas designated for each academic discipline throughout the building. These frequent transitions are often a cause of stress for many new students who begin their high school career feeling lost or overwhelmed by a comprehensive high school schedule in a large building. Ninth-grade students participate in classes taught by different teachers who often do not share common students. Other than the ETA program, there is no central location for these ninth-grade students to attend classes or the opportunity for them to share a common group of teachers who could monitor their progress and plan coordinated supports.

Ellerbrock and Kiefer (2014) define a community of care as a 'school culture in which students and teachers care about and support each other, individuals' needs are satisfied within a group setting, and members feel a sense of belonging and identification with the group" (p.3). While our teachers take an interest in the well-being of all of our students and work diligently to support them during their transition to high school, their desire to form such a community of care specifically to support ninth-grade students is impacted by the lack of space in the current building which prevents the ability to schedule all ninth-grade students into ninth-grade academies /teams.

The vision for the ninth grade in the new school is to create a ninth-grade neighborhood to promote a supportive community, or a community to guide students during the transition from middle school to high school. This would include an area of the school designated specifically for ninth-grade classes with close proximity of classrooms for core academic classes that would allow for teaming and cross- curricular sharing and designated collaborative space to successfully deliver the curriculum and support ninth-grade students during their transition to

Doherty Memorial High School. Teachers would be able to utilize a team-approach by sharing the same caseload of students allowing them to build stronger bonds with ninth-grade students and offer a range of supports.

All ninth-grade students take the core academic subjects in addition to required elective courses. The typical ninth-grade schedule includes English I, Algebra I or Geometry, Biology, World History II, World Language, Physical Education (0.25 credits), Introduction to College and Career Readiness (ICCR), and (0.25 credits) Arts elective/other additional core electives.

As part of a ninth-grade academy, students and teachers will benefit from close proximity of grade-alike courses and shared collaborative space within sightline of classrooms, designed to facilitate break-out sessions, foster cross-curricular sharing and study as well as support interdisciplinary project-based learning. Such common areas will support such opportunities and allow for shared presentations and collaboration among teachers and classes. These areas need to be able to support a distributive model for technology (Chromecarts) and opportunities for students to publish (both in print and digitally) and present materials.

Teachers from each content area, working in grade-alike Professional Learning Communities (PLCs) can focus on their particular group of shared students and plan engaging and rigorous instruction while reviewing data and identifying academic, social/emotional, and behavioral issues of their shared students. Within this collaborative space there needs to be an area dedicated to supporting professional learning, complete with areas for presentation and modeling classroom strategies.

In order to support the ninth-grade team as part of the transition program, there will need to be ease of access to other school support services and flexibility to grow and change these spaces as enrollment and student needs change. Flexible office space than can be used to house an administrative and other support staff will help to support the program and foster a community of care for the students (Ellerbrock & Kiefer, 2010; Ellerbrock & Kiefer, 2014).

The proposed ninth-grade academy will be able to utilize the school's bell schedule but will have the flexibility to combine classes for programming opportunities. The break-out spaces should be large enough to allow multiple classes or a team to meet for presentations for both students and their families and have appropriate technology (Epson boards, document cameras, sound system, etc.) to support such programs and presentations. The classrooms should have collaborative doors to allow for team teaching and integration of subjects. Additionally, each area of this part of the building will need appropriate heating/ventilation and natural light to provide a welcoming and productive environment. Students will need access to lockers within the academy to allow for ease of access during their time in their core academic classes. The ninth-grade academy will

house classes for the core academic subjects and therefore should be located between the humanities and the STEM neighborhoods to allow for vertical articulation and collaboration in each subject area.

Advanced Academy

In January 2012, during his inaugural speech, Mayor Joseph M. Petty announced a goal of establishing an exam school in Worcester as part of his educational platform. Subsequent to that speech, Mayor Petty appointed an Ad-Hoc Committee, chaired by School Committee member Tracy O'Connell Novick, and comprised of other school committee members, higher education partners, community partners and parents. This Ad-Hoc Committee was charged with studying "the feasibility of establishing an exam school for students in Grades 9 to 12 which would develop and promote academic excellence relevant to success in the 21st century." They spent several months researching, studying and visiting exam schools, and researching available curricula and programs such as the International Baccalaureate and Project Lead the Way programs, as it formulated recommendations to be presented to Mayor Petty and the Worcester School Committee. Additionally, several public hearings were held throughout the time.

In June 2013, the Ad-Hoc Committee recommendations were forwarded by the Worcester School Committee to the Superintendent for consideration in the creation of a proposal to establish a high school option for high achieving students. Since that time, the Worcester Public Schools Superintendent and Senior Leadership Team members have reviewed those recommendations and conducted additional research resulting in a proposal for "A Pilot Innovation Academy for Worcester Public Schools."

As indicated in the Statement of Interest (SOI), and in the Request for Designer Services (RFS), the Advanced Academy was initially proposed (Fall 2013) to be housed at Doherty Memorial High School but due to lack of space, this did not occur. At the time, this program would have involved an additional 250 students and would require ten classrooms dedicated to advanced academics for the Worcester district. If there had been additional space at Doherty, it would have provided a central location for students from all areas or the city in a location that did not cost the district any additional monies in rental agreements.

While Massachusetts leads the nation in most educational indicators, it is virtually silent on the identification and education of gifted and high achieving students. Worcester Public Schools has been on the forefront of academic programming for these students. Specifically, the Goddard Scholars Program serving gifted and high achieving students from across the district at Sullivan Middle School and South High Community School. The Goddard Scholars Program at Sullivan Middle School is one of the district's first innovation academies. The teachers in that program

have expanded their knowledge of and implementation of pedagogy and best practices in gifted education. The Arts Magnet Pathway from Worcester Arts Magnet School to Burncoat Middle School to Burncoat High School has developed students with gifts, talents and interests in the visual and performing arts for many years with state and national recognition of their performances, productions and artistic creations. Across the district for gifted and high achieving students, Worcester Public Schools offers 23 Advanced Placement Courses to students. Additionally, our students are able to earn college credit through dual enrollment opportunities with local colleges and universities.

It should be clearly noted and understood that this Advanced Academy is not designed to replace or supplant any of the existing programs serving gifted and high achieving students. Rather, the Academy will be an additional option within the Worcester Public Schools portfolio of school and program offerings. The district will continue strong support for and enhancement of those existing programs.

Doherty Memorial High School, and the Worcester Public Schools, is poised to begin implementation of the Advanced Academy through communication and outreach efforts starting in the district's middle schools. In addition to core academics, students throughout Grades 7-12 in the Advanced Academy will enroll in coursework focusing on the biomedical and biotechnological sciences. The target population is students who have demonstrated exceptional interest in and an ability to be successful in a rigorous high school program of studies leading to advanced college readiness. The Academy will attract students from throughout the City of Worcester and will enroll 50 students per grade, for a total of 200 students from across the district. Students would apply while in Grade 6. Accepted students would join together to form a cohort, and this group would matriculate to a common middle school (Forest Grove Middle School), which is the primary feeder school to Doherty. This cohort would take core academic courses, and an introductory science course within this Biomedical Sciences sequences. This cohort would remain together in Grade 8, and then all would move on to Doherty Memorial High School for ninth grade.

School and district personnel within the Advanced Academy would review all middle school students' academic records and invite students who receive Advanced in both English and Math on the MCAS in Grade 6 to apply to attend the academy. This is similar to the other programs in the district, including the Goddard Scholars program a South High Community School and the Hanover Academy at Burncoat High School. Beginning in the 2022-23 school year, 50 students will be accepted from all areas of Worcester, including but not limited to the Doherty quadrant.

The district will create an admission set of criteria, an application, and a process for selecting and notifying students. The admissions criteria will include:

- A completed application

- A review of academic grades from the student's seventh and eighth grade transcripts
- MCAS and/or other state assessment scores
- Transcript/grade report showing courses enrolled in and completed in middle school
- Student essay
- Teacher recommendation from one core academic teacher
- Attendance history
- Other criteria, if any, that the district deems necessary.

The application process will be coordinated by the district and Advanced Academy Assistant Principal, and applications will be reviewed and scored. Should the number of eligible students oversubscribe the number of available student slots, a lottery will be held.

The Advanced Academy, in addition to Massachusetts general education course requirements and college and career readiness skills, will incorporate and deliver a coherent curriculum focusing on the biotechnology and biomedical sciences. Labor Market trends from Central Massachusetts, statewide, as well as from national databases all demonstrate an increasing need for qualified employees. Further, there are numerous entry points to the Biomedical and related fields based on the students' level of education, including Associate's and Bachelor's Degrees.

Advanced Academy – Biomedical Curriculum Focus - Occupational Projections
Table 3

Central Massachusetts Employment Projections – STEM and Related Occupations, Executive Office of Labor and Workforce Development					
Occupation	Employment 2016	Employment 2026	Percent Change	Typical Education needed for Entry	2018 Mean Annual Wage
Chemical Technician	168	170	+1.19%	Associate's Degree	$57,829
Biological Technician	296	319	+7.77%	Bachelor's Degree	$43,311
Medical and Clinical Lab Technologist	784	880	+12.24%	Bachelor's Degree	$61,876
Medical and Clinical Lab Technician	166	181	+9.04%	Associate's Degree	$43,824
Microbiologist	166	175	+5.42%	Bachelor's Degree	$85,279
Biological Scientist	195	216	+10.77%	Bachelor's Degree	$72,822

In Worcester alone, Biomedical- and Biotechnological-related industries have increased their presence. Support from local post-secondary schools demonstrates a strong current and healthy outlook for future needs. For example, in 2010 Worcester Polytechnic Institute (WPI) completed the development of their Gateway Park – a facility blending research, studies, innovation, and industry. Within this multi-facility park, WPI designed and implemented a Biomanufacturing Education and Training Center, as well as a Life Sciences and Bioengineering Center. In addition, several private industries have established sites within the complex. In 2006, Dr. Craig Mello, of the University of Massachusetts Medical School, was awarded the Nobel Prize for his work in Medicine and Physiology. This accomplishment heightened local attention to this growing field. Assumption College offers degrees in Biotechnology and Molecular Biology, Quinsigamond Community College provides Associate's Degrees and Certification trainings in several related fields, and many other area colleges offer similar programs and coursework.

The Advanced Academy sequence of courses will blend district-developed courses with nationally recognized providers of rigorous and innovative curriculum: Project Lead the Way (PLTW) and the College Board's Advanced Placement (AP) Program both offer curricula and resources that emphasize the utilization of information and skills from the classroom to a career. The Advanced Academy courses focusing on the biomedical and biotechnological sciences will be available only to students accepted into the program.

Doherty currently offers a Biochemistry course to students in Grades 11 and 12. From a review of post-secondary degree programs and related coursework, as well as identifying common preferred skills for those seeking employment in biomedical and biotechnological fields, the school will be working with secondary, post-secondary, and industry professionals to design additional course offerings to ensure students are appropriately prepared for their entry into college and/or into a career. These courses will likely focus on genetics, gene editing, immunology, microbiology, laboratory skills, and a strengthening of the existing biochemistry coursework. As a result of this partnership, the goal is for students to see practical applications of this work through learning opportunities within the community.

Project Lead the Way's Biomedical Sciences (BMS) Curriculum Program is designed for secondary-level students and engages students in learning content and activities relating to human medicine, bioinformatics, cell biology, genetics, disease and other biomedical topics. The BMS program offers a sequence of three foundation courses and ends with a capstone course. These courses are designed to support and enhance Doherty's core science course offerings.

There is a strong programmatic alignment between PLTW and the College Board. Curriculum sequencing within the Biomedical Sciences program align and mutually supports Advanced Placement Biology and Chemistry courses. The PLTW courses emphasize applied learning and provide foundational coursework and learning activities to introduce students to the field. In

Grades 11 and 12, the specialized PLTW courses focus on knowledge and skill development for entry to college and careers. The AP courses, and associated exams, provide additional opportunities for advanced coursework, as well as college credit.

As part of the MassCore graduation requirements, all students in the Worcester Public Schools must complete a minimum of three laboratory-based science courses. The majority of students, to ensure college and/or career readiness, enroll in a science course each year. To successfully offer this advanced Biomedical Science coursework, students in each grade will be enrolling in an additional laboratory-based science course. For example, students in Grade 9 will take Biology, the traditional first-year course offered to all students in Doherty. This course engages students in rigorous learning experiences, lays the foundation for subsequent coursework, but also prepares students for the MCAS exam. Ninth- grade students accepted into the Advanced Academy will also enroll in the PLTW Principles of Biomedical Sciences course. By participating in this course of study and by engaging in college and career readiness activities throughout this program, these students will be well-prepared and knowledgeable about the many opportunities in this field in terms of college majors and employment opportunities both locally and globally.

Often, students enroll in one science course per year. During the 2018-2019 school year, 102 students enrolled in two or more unique science course offerings. With the inclusion of this Biomedical Science program, 50 additional students will be taking two laboratory-based science courses simultaneously. This added enrollment will necessitate an additional science laboratory, and associated storage and preparatory spaces. Each of these BioTech/Biomedical Science courses will be designed for 1 credit, or the equivalent of a 1-period, full-year course. Advanced Placement Biology and Chemistry courses, due to the rigorous laboratory work embedded within their respective curricula, are 2 credit courses, requiring 2 periods of instruction each year. Therefore, at full enrollment Doherty expects to run an additional 12 periods of science instruction each year. With a seven-period day, the implementation of the Academy will necessitate an additional two dedicated laboratory classroom spaces. One of these laboratories will be utilized for advanced coursework in anatomy and physiology and will be supported by the inclusion of at least 2 Z-Space, or virtual dissection tables. These state-of-the-art AR/VR devices provide industry-level training and skill development and avoid the necessity of dissection specimens.

The Academy-related science classrooms and laboratory spaces would ideally be situated within the science cluster: there is no necessary adjacency to another program or space within the building.

Students in the Academy will benefit from shared enrollment in the other general education courses at Doherty Memorial High School, such as Mathematics, English, Social Studies, etc. In

addition, Academy students will have access to the range of other elective and required courses including Physical Education, Health, Arts and a range of Advanced Placement courses.

B. Class Size Policies

Doherty Memorial High School follows the class size and teacher course load policies set by the Worcester Public Schools. Each teacher has a maximum of 125 students in his or her caseload which consists of the combined total of their five classes with an average of 25 per the negotiated teacher contract. During the 2018-19 school year, the average class size at Doherty Memorial High School was 22.2. However, during the same school year there were 451 classes with over 25 students enrolled in them and 27 courses with enrollments of 30 or more. Some programs, such as the Engineering and Technology Academy (ETA) are impacted by the class size and space requirements for safety reasons. As a result, the number of students who are able to participate in the ETA at each grade level is capped at 100, following the Career Vocational Technical Education (CVTE) guidelines.

The National Science Teacher Association safety guidelines recommend no more than 24 students in a laboratory setting at one time. Another guiding document – the STEM Learning Design's Review and Recommendations of Best Practices for K-12 STEM Learning Spaces report – also recommends a maximum of 24 students in the laboratory. In addition, the Worcester Public Schools contract designates a maximum teacher load of 125 students, and all teachers are assigned 5 teaching periods, resulting in 25 students per class. All classes will be scheduled with safety recommendations in mind.

Class Size Data for Doherty for Core Academic Subjects for 2018-2019

Table 4

MATH	**Average Class Size**	**# Classes**	**# Students**
Algebra 1	24.09	11	265
Geometry	24.68	16	395
Algebra 2	28.08	12	337

Statistics	23	1	23
AP Statistics	28	1	28
Pre-Calculus	26.6	8	213
Calculus	25.5	2	51
AP Calculus BC	30	1	30
AP Calculus AB	20	1	20
SCIENCE	**Average Class Size**	**# Classes**	**# Students**
AP Biology	25.33	3	76
AP Environmental Science	28	2	56
AP Physics 1 (AP Physics 2)	24.66	3	74
Biology 1	24.11	17	410
Biology 2	24	4	96
Biotechnology	25	1	25
Chemistry	24.3	13	316
Physics	26	4	104

Human Anatomy	26.8	10	268
Social Studies	**Average Class Size**	**# Classes**	**# Students**
World History II	23.68	16	379
US History I	25.68	16	411
US History II	27.3	13	354
Psychology	25.8	5	129
Sociology	15	3	45
AP World History	11	1	11
AP US History	25	2	50
AP Psychology	21.66	3	65
AP Human Geography	24.75	4	99
AP Government and Politics	23	1	23
ENGLISH	**Average Class Size**	**# Classes**	**# Students**
English 1	20.05	18	361
English II	22.4	17	381

English III	27	14	375
English IV	23.6	13	307
World Language	**Average Class Size**	**# Classes**	**# Students**
Spanish 1	15.25	8	122
Spanish 2	20.06	15	301
Spanish 3	19.75	8	158
Spanish 4	19.5	2	39
AP Spanish	17	1	17
French 1	25	2	50
French 2	13	2	26
French 3/4	10	1	10
Latin 1	17	2	34
Latin 2	16	1	16
Latin 3/4	8	1	8

Class Size data for the Worcester Public Schools

Table 5

All Classes 2017-18			
Grade Level	Avg Class Size	# Classes	# Students
PK	15.2	77	1167
K	18.9	928	17519
1	25.9	560	14505
2	27.3	532	14521
3	25.9	511	13231
4	24.1	483	11649
5	28.2	470	13241
6	15.5	19	294
7	19.5	177	3450
8	19.0	805	15256
9	19.6	223	4366
10	14.5	779	11285
11	14.0	696	9768
12	13.5	1008	13567
88	8.9	64	570
99	9.1	284	2592

English, Math, Science, Social Studies, Foreign Language, Arts, CTE and CVTE Classes			
Grade Level	Avg Class Size	# Classes	# Students
PK	14.6	66	963
K	17.4	655	11418
1	25.9	480	12431
2	27.3	456	12446
3	25.9	438	11339
4	22.1	414	9155
5	24.3	402	9751
6	18.3	13	238
7	18.8	150	2823
8	18.2	715	12993
9	19.8	175	3461
10	15.2	591	8979
11	15.3	543	8323
12	14.9	755	11274
88	8.9	64	570
99	12.0	158	1894

District	19.3	7616	146981

District	19.4	6075	118058

Additional course offerings are impacted by the lack of available classrooms. In order to offer additional courses to support college and career readiness in the global community, we would need both additional teachers and classroom space. While some classroom space needs to be specific to the course offerings, such as science courses or Career Vocational Technical Education, (CVTE) courses, other additional classroom space needs to be flexible in order to adapt to changing course needs and to support future changes in the curriculum frameworks.

C. School Scheduling Method (including Advantages and Disadvantages)

The school day begins at 7:20 a.m. and ends at 1:43 p.m. and includes a traditional seven-period day. The scheduling process is completed through a collaborative effort between the administration and the guidance department. Periodically throughout the year, the guidance staff meets with students to discuss their academic programming. Each spring, counselors work with students to complete the course selection process for the upcoming year. Attention is given to areas of student interests, college and career goals, and graduation requirements. Beginning in the 2018-19 school year, the course selection process was done electronically but in previous years had been done on paper and then the data entered into the computer program. By having the students complete this part of the process electronically in the portal, families can review and discuss the selections together and adjust accordingly. The courses are then approved by the counselor to be sure that they are consistent with all grade level requirements. This way, the data can be uploaded directly to formulate course tallies without data entry errors. Course tallies are used to determine the number of sections of each course to be offered and every effort is made to accommodate students' requests for courses. The scheduling program used by the Worcester Public Schools allows for flexibility as the process evolves, including allowing us to do batch scheduling changes and to link courses through Mass Schedule Edit feature.

The difficulty we face in the scheduling process is available classroom space to accommodate the courses and number of sections we need to offer. The school is overcrowded, and the facility does not support the needed academic programming. Room utilization is at nearly 100% for most spaces throughout the day. The classrooms used for the Special Education classes are too small to use for most other courses or purposes and some courses are being taught in spaces for which they were not intended. For example, art is being taught in a converted home economics classroom. Science is being taught in rooms that are not equipped for labs. Additionally, 50% of

the teachers travel from room to room to teach their classes and noble attempts are made to limit the distance in order to avoid adversely affect teaching and learning.

Doherty calculated the room utilization rates for each department, for general and special education, and for the school. In this calculation, we considered every space available, even those classrooms that provide instruction through an open-concept approach. For example, one of our classrooms (room 212) is subdivided into three spaces (212A, 212B, 212C) even though all are within the same class area. This subdivision of additional classroom space is due to the severe overcrowding within the current building.

With nearly 100% room utilization, we are not in a position to easily add staff to our existing building, and therefore must maintain careful supervision of caseloads, class sizes, and contractual agreements. A disadvantage for our school is that the SAGE (Student Attendance Grading and Enrollment) program allows for each counselor and administrator to make changes to a student's schedule. This can be problematic forcing us to monitor these types of changes. At times we must follow a one-student-out / one-student-in policy in order to adhere to the teacher caseloads as prescribed by the negotiated contract.

Room Occupancy Information (2018-2019)

Table 6

Department	# Assigned Classrooms	# Available Periods of Instruction	# Instructional Periods used by department/assigned personnel	# Instructional Periods used for other departments, coursework, scheduled sessions	Combined Usage Rate per day
Math	11	77	64	9	73/77 = 95%
Social Studies	10	70	64	4	68/70 = 97%
World Languages	7	49	43	4	47/49 = 96%
Art	2	14	14	0	14/14 = 100%

English Language Arts	10	70	61	5	66/70 = 94%
Science	10	70	62	3	65/70 = 93%
Computer Science	2	14	11	1	12/14 = 86%
CVTE Engineering Technology	4	28	20	5	25/28 = 89%
Gymnasium	1	7	7	0	7/7 = 100%
Health	1	7	5	1	6/7 = 86%
Music/Theater	2	14	14	0	14/14 = 100%
Miscellaneous	3	21	17	3	20/21 = 95%
EL	2	14	10	4	14/14 = 100%
School Usage Rate for Classrooms able to hold a general education sized classroom				431/455	94.7%
Special Education	9	63	53	0	53/63 = 84%
School Usage Rate for classrooms with a layout able to accommodate 5-15 students				53/63	84%
School-wide Classroom Usage Rate, All Students/Courses				484/518	93.4%

With the 2019-2020 schedule, the room utilization pressures have increased with the addition of new staff members and the increased student enrollment. Within the current space, there are 76 total classroom spaces, albeit several rooms are really subdivided spaces within a single classroom space. Of these 76 rooms, 9 are designated as SPED spaces. 67 therefore are general education spaces, which includes science, health and physical education, art, CVTE programming, and core and elective programming. During the 2018-2019 school year, these spaces had a 94.7% utilization rate, and this was based on a maximum population of 1,529 students. ~~Of the 64 general education classrooms throughout the school, these are utilized 98% of each school day, an increase from 94.7% from the prior school year.~~ The school utilized non-traditional classroom space for four periods throughout the day, including the utilization of the library (3) and the auditorium (1) due to scheduling demands. The school also assigned five sections into the cafeteria, as there were limited, or no, available classrooms for those respective periods.

The student population is expected to increase by approximately 150-180 students. As each student needs 7 classes per day, this translates to, at a minimum, an additional 42 instructional periods of core and elective instruction (150 students x 7 periods ÷ 25 students per section). 42 instructional periods correlates to 6 full classroom spaces (42 spaces ÷ 7 periods) at a minimum. As we understand the MSBA space summary template, there are 80 non-SPED capacity generating spaces. With the increased student population and commensurate increase in course offerings, Doherty estimates the room utilization rate as follows:

During the 2018-2019 school year:

- 67 general education classroom spaces
- 7 periods of potential utilization; 67 x 7 = 469 instructional periods available utilization rate of 94.7% = 444 instructional periods taught within the general education classroom spaces.

Within the PDP proposal for the new building:

- 80 general education classroom or capacity generating spaces proposed
- 7 periods of potential utilization; 80 x 7 = 560 instructional periods available
  If we assume current scheduling (444 instructional periods) and factor in the minimum addition of 42 instructional periods, then the total minimum instructional periods being run will be 486

This creates a utilization rate within the general education spaces of approximately 86.7% (486 ÷ 560). In reality, there will likely be more than 42 additional periods created due to the increased population, and each additional period will increase the school's room utilization rate.

In addition, when compared to other schools, Doherty is currently understaffed for its student population. Doherty is unable to grow current programming due to lack of space; average class sizes, counselor ratios, etc. are comparatively high; and many classrooms are inadequately sized and provisioned. When planning for the new school, Doherty's proposal seeks to remedy these issues by offering additional programming, hiring additional staff, ensuring all classes - general and special education - are taught in appropriately sized classroom, etc. Currently, there are many special education students who receive a range of services, as well as are included within the general education classroom(s) to varying degrees. Each year, the numbers of students in full or partial inclusion change. The Space Summary template as well as the adjacency diagrams included within the PDP demonstrate the flexible orientations that will be possible as special education classrooms are integrated into the core academic spaces.

The advantages of having a scheduling program within the database written by members of the district and specifically for our district is that the modules, reports and overall program can be customized to meet the needs of our district and of the individual schools within the district. A committee, composed of several individuals across the district and led by the Manager of Instructional Technology and Digital Learning, is currently reviewing other options for scheduling and database management products to determine how to best support the needs of the district as one disadvantage to our current program is that many commonly used, industry standard programming packages (e.g. PowerSchool) more readily interface with the varied sources of student and school-wide data (e.g. standardized exam results from the CollegeBoard, or the ability to import/export information into Naviance, the college/career planning platform) and that many commonly used, industry standard programming packages provide a singular interface for all stakeholders to access information including grading and progress reporting and to facilitate communication between groups (e.g. student-to-teacher, teacher-to-parent, school-to-family).

The vision for the new school is to continue to use the district high school bell schedule which consists of a seven-period day, so every class meets every day. While our previous bell schedule included a rotating extended block to support learning activities that may have benefitted from additional class time on a six-day rotation, the new schedule has been implemented across the district beginning this school year. This recent standardization of bell schedules has allowed district-wide participation in Early College and Dual Enrollment opportunities for students in all of our high schools. The plan is to continue to utilize the district scheduling program while other options are explored by district personnel. Additionally, all Grade 9 students will be scheduled

into ninth-grade teams to support their successful transition to high school as described in detail in the grade configuration section of this document.

In 2016, at the onset of the MSBA process, the proposed enrollment for Doherty Memorial High School was set at 1,670 students. This figure was determined as a result of a collaborative analysis of enrollment projections and space capacity needs for the Doherty Memorial High School project. This enrollment figure was based on demographic trends, as well as the recognition that Doherty has one vocational program.

As design work continued, and as more community and varied stakeholder input was gathered, for example through a series of school and community member visioning workshops, the community's desire to grow the curricular and college/career programming options available to students became evident. After much stakeholder input, from a review of current district educational program offerings, and with a thorough labor market analysis, the school is including within this design a proposal to add three vocational programs as well as an advanced academy with a curricular focus on the biotechnology/biomedical sciences. These four additional programs would be open to all students from across the district.

Doherty currently offers a vocational Engineering Technology program. This program was certified 10 years ago, and all Worcester residents are eligible to apply. Each year, the school admits students from across the district, including some entering the public schools from the area's private and parochial options. Enrollment figures for the 2019-2020 school year are representative of this pattern. Of the 370 students currently enrolled in Grades 9-12, 57% of these students reside in the Doherty quadrant and, theoretically, would be eligible to attend Doherty based on their home address. The remaining 158 students are 'out-of-district' and, without the benefit of the vocational program, would be assigned to their home school.

When the enrollment projections for the project were determined, the committee took into account the existing vocational program (Engineering Technology) as well as anticipated population trends across the city. After planning sessions, visioning exercises, and community input, the committee has included the three additional vocational programs and the advanced academy, all of which are available to students from across the district. There is a possibility that there may be greater student interest in Doherty and/or the available programming than expected. If so, then the student population could surpass 1,670.

The three additional vocational programs, along with the Advanced Academy, will similarly be available to all Worcester residents. It is reasonable to predict that a comparable percentage of 'out-of-district' students will be admitted to these programs. Due to concerns about overpopulation, the district has decided to reduce the enrollment of the new vocational programs that are held during the school day without changing the space summary specifications.

- Programming and Web Development: Program enrollment is estimated at ~~200~~ 160 students. ~~If 43% come from outside of the Doherty quadrant, this represents an estimated additional 86 69 students being served within the new building.~~
- Construction Craft Laborer: Program enrollment is estimated at ~~150~~ 120 students. ~~If 43% come from outside of the Doherty quadrant, this represents an estimated additional 65 52 students being served within the new building~~
- Marketing, Finance and Management: Program enrollment is estimated at ~~200~~ 160 students. ~~If 43% come from outside of the Doherty quadrant, this represents an estimated additional 86 69 students being served within the new building~~
- ~~Advanced Academy: Program enrollment is estimated at 200 students. If 43% come from outside of the Doherty quadrant, this represents an estimated additional 86 students being served within the new building.~~
- ~~In total, if estimating similar enrollment patterns, the new Doherty would accommodate an additional 323 276 students. With the current added enrollment of 158 students from the Engineering Technology program, there is potential for an additional 481 434 students. This does not account for the students applying for, and receiving, special permission, which allows students to obtain a voluntary transfer and to enroll in the general education programming at our school from a different "home school" within our district.~~

Admittedly, it is difficult to predict the application figures for these new programs. However, the school administration is mindful that students are always able to attend their home school, which is the school assigned to them based on their current home address. There is a subset of Worcester students who can attend Doherty Memorial High School through the voluntary transfer process without applying or being accepted to any of these vocational programs or the advanced academy.

In planning for the future, the school will have the capacity to increase the student population within these programs. Similar to the Innovation Pathways Program, the school would have the capacity to offer course offerings for students after-school hours.

~~Therefore, design elements of this Feasibility Study reflect an expected enrollment larger than the stated figure of 1,670 students. For example, the cafeteria seating area will certainly be overcrowded if designed for a capacity of 557 students (1670, 3 seatings). For the purposes of this Feasibility Study, the cafeteria's capacity should more likely be 675 students for each seating.~~

D. Teaching Methodology and Structure

Doherty Memorial High School maintains high expectations for all learners while providing them with academic and social-emotional support needed for success in school and in life. The school is guided by its mission and core values and uses its focus statement to support student learning.

Mission Statement

Doherty Memorial High School empowers students to become critical and independent thinkers as well as life-long learners. We encourage diversity and creativity as we partner with our students and their families, our teachers, and our community to provide an education in a safe and caring environment.

Core Values

Academic Values

- Thinking critically
- Thinking independently
- Responding thoughtfully
- Practicing life-long learning skills
- Applying creativity

Civic and Social Values

- Appreciating diversity
- Partnering with students, families, and community members
- Working within a safe and caring environment

Focus Statement

Doherty Memorial High School is implementing a school-wide effort to demonstrate measurable growth in students' ability to read critically and respond thoughtfully in writing as evidenced by progress on external measures, such as the MCAS and the PSAT, and internal measures, such as Star and other common assessments

Doherty Memorial High School is a comprehensive high school. The faculty/staff is organized by academic departments: English Language Arts (ELA), Science, Mathematics, Social Studies, Career Vocational Technical Education (CVTE) Programs, Music, Art, Special Education,

World Languages, Guidance, Physical Education (PE), and Administration. Faculty members meet by department to plan instruction, engage in professional learning opportunities and collaborate in Professional Learning Communities (PLCs) within these departments or grade-alike groups. Additionally, some teachers of elective classes (Art, Music, PE, Marketing, and Health) meet within one of the departments, or participate in similar monthly meetings with district-level personnel.

Most departments are assigned a set of classrooms for their primary use, and as such most classrooms within a department are located in proximity to each other. There are several 'departmental' classrooms that are not located near the other classrooms in their department due to the layout of the building, along with the limited classroom spaces.

Doherty has a CVTE Engineering Technology program that includes two grade-level, interdisciplinary teams (Engineering, Mathematics, Social Studies, Science, and ELA), one for Grade 9 and the other for Grade 10. The Grade 9 team, and the associated departmental classrooms, are located in proximity to one another and near the engineering classroom and laboratory space.

While there are a few areas in the current facility that have air conditioning it is important that the new facility have proper heating and cooling capabilities throughout the entire school in order to support optimal teaching and learning.

Administration/Academic Organization/Structure

There is one principal and there are four assistant principals, each with approximately 400 students in their caseload. One assistant principal is assigned all students in the CVTE Engineering Program as part of his caseload along with a portion of the comprehensive school population. All other students are assigned alphabetically to the other assistant principals. These administrative offices are located in two areas of the building. Two assistant principals' offices are located on the first floor near the principal's office and the guidance office. Two other assistant principals' offices are located in a second administrative suite on the third floor in order to maximize effective supervision and safety procedures.

The vision for the new school is to place administrative offices for the assistant principals in locations that will support effective supervision of students and close proximity to programs within the school. Maintaining the current administrative suite format (two assistant principals in separate offices with a shared space for a shared administrative support personnel and supervised areas for students) in two areas of the school. These shared spaces need to have a designated place for meetings with students, parents, and counselors. Each individual office needs adequate space for meeting with students and parents and access to technology. An area designated for the

administrative support personnel needs to have access to technology and serve as a welcome center for those visiting the administrative offices.

With the projected increase in enrollment and the expansion of course offerings in the new building there is a need to increase the number of assistant principals to meet the needs of the growing enrollment and the diversified programming including the additional vocational pathways, the Grade 9 teams and the Advanced Academy and to be more consistent with the district's administrator to student ratio. The administrative offices will need to be located throughout the "neighborhoods" to support the students and staff and to increase opportunities for collaboration. It is important that all leaders are also active learners and continuously seek to support and engage in professional learning communities and school wide improvement efforts along with the faculty. Additionally, at least one school adjustment counselor will have an office adjacent to each assistant principal pairing in order to support the district's focus on promoting student resilience and to support social-emotional learning and proactive problem solving. The increased community use of the new facility, coupled with the level of after school programming that will be afforded to the school community will result in the need for additional administrative coverage beyond the regular school day and the school year.

Curriculum Delivery Methods and Practices

At Doherty Memorial High School, we believe in the 4 C's: critical thinking, communication, collaboration, and creativity and we have designed and implemented learning experiences for students that integrate all four of these areas, despite having a facility that does not support these activities in the manner in which it should. We also subscribe to the importance of rigor, relevance, and relationships. In our decennial report, the NEASC visiting team described the relationship between and among the adults and the students as a true strength of the school.

Teachers at Doherty Memorial High School employ a variety of instructional methodologies in their classes to deliver the curriculum. Guided by the Worcester Public Schools High Quality Teaching and Learning document they engage in practices that include whole-group and small group-instruction, modeling, and fostering opportunities for student-centered academic discourse and collaboration. The school is also guided by the Focus Statement and associated student-friendly strategy DHS SCORES (Decode- Read the question carefully, Highlight the tasks and terms, Stop-What is being asked?- Start to answer the question, Compile evidence and information, Organize your thoughts on paper, Respond thoughtfully in writing, Edit and review your work, Scoring higher equals success) to support critical reading and thoughtful writing in all classes across the curriculum. Teachers are increasingly integrating project-based learning into their curriculum to provide students with real-world learning experiences and to support college and career readiness. Programs such as the ETA regularly engage students in

interdisciplinary learning activities that are highlighted during several learning fairs during the school year.

All classrooms and common spaces will enable staff, students, and outside personnel to utilize standard presentation and communication technology. Standard technology includes Epson bright link short throw projector, document camera, LED display is desired with screens that support both independent and mirroring displays; Chromecast/apple TV and speech reinforcement for classwork displays, announcements, etc.; standard Ethernet ports and wireless hubs providing varying degrees of access; and telephone capacity enabling calls between rooms along with connections to outside lines. These align with all stakeholder needs identified during the various listening and visioning sessions, including community members who imagine how outside organizations could benefit from the communal spaces.

English Language Arts

The mission of the English Language Arts program in the Worcester Public Schools is to provide a balanced approach to literacy to empower students to think critically and strategically, communicate effectively, and fully support arguments. Students read, comprehend, and critique a range of complex texts and media, write and present for various audiences and purposes, and develop habits of reading for enjoyment. This supports the school's focus to read critically and to respond thoughtfully in writing.

Doherty Memorial High School offers a variety of full year (1 credit) and semester (0.50 credit) courses in English Language Arts (ELA). The current 1-credit ELA course offerings include English I-IV, Academic Literacy I -IV, Journalism I-II, Advanced Placement English Language and Composition, and Advanced Placement (AP) English Literature and Composition. During the 2018-2019 school year, there were four sections of AP English scheduled, serving a total of 78 students. All are scheduled as a one-period block.

All students in the school are enrolled in an English course every year, as four years of ELA is a graduation requirement. Students may take additional ELA courses based on interest (Journalism, Creative Writing, Theater) or need (Academic Literacy). Creative writing is a semester-long, 0.50 credit course that was added to the course offerings during 2018-19. Theater I-IV has been a part of the ELA department in past years. There are plans to grow the theater program as part of the expanding performing arts program beginning in the 2019-20 school year with the addition of a dedicated full-time theater teacher. Additionally, as part of the Early College High School program (Appendix 2), the English department, in conjunction with Quinsigamond Community College will offer English 101/102 on the Doherty campus as an additional way to support college and career readiness and provide students with another opportunity to participate in more advanced coursework while earning college credits.

The English department has sixteen teachers and ten classrooms dedicated to ELA instruction. In total, these staff provided a combined 66 instructional periods of English and general electives. With only ten rooms available in the area designated for the English department teachers often have to travel between rooms for classes. Elective courses such as Journalism, Creative Writing and Theater are scheduled into available classrooms, and therefore are often located outside of the area of the building dedicated to the English department. For the 2018-2019 school year, these 10 'English' rooms had a combined usage rate of 94% (66 used periods out of 70 available periods). With the addition of new staff members next year, we will be faced with additional challenges when scheduling English classes within the current departmental space and will be forced to increase the number of teachers who need to travel to a classroom to teach.

Most of the ELA classrooms are not designed to effectively support a 21st century integrated humanities curriculum. The physical layout of these rooms discourages effective grouping practices, collaborative work, and flexibility. In addition, there were several other non-ELA classes scheduled into these rooms, due to the available space (e.g. Social Studies, World Languages). ELA classrooms are outfitted as general education classrooms, mainly comprised of a whiteboard and tablet-arm chairs. The available space in these rooms often make it difficult to arrange furniture to such classroom activities as whole-group Socratic Seminars or small-group project-based learning activities.

Curriculum in the ELA classes is delivered using a variety of instructional methodologies including but not limited to whole-group instruction and modeling and whole-group and small group discussion, and collaboration that supports the school's focus on reading critically and responding thoughtfully in writing using AP strategies, Self-Regulated Strategy Development (SRSD),and Advancement Via Individual Determination (AVID) strategies. Classes utilize technology in a variety of ways including the use of video and audio to support critical response, document cameras for modeling and collaboration, and Chromebooks (Chromecarts) for research, collaboration, writing, and publication. While collaboration and project-based activities are incorporated into the lessons in the ELA department, limited classroom and collaboration /break-out space can impact the ease and frequency of use of these activities. For example, when multiple classes have joined together to participate in station rotation activities, these classes have had to move to larger areas such as the cafeteria which provides more space and more flexible arrangement of furniture.

The vision for the English Language Arts department space in the new school includes maintaining the department structure for Grades 10 through 12 and includes classrooms of standard size with natural light and appropriate heat, cooling and ventilation and communication doors between rooms to support collaborations. There is a need for additional classroom and collaboration space to successfully deliver the ELA curriculum and grow the programs at

Doherty Memorial High School. Collaborative space is needed to support increased opportunities for students to engage in the multi-stage/ multi-draft writing process and include opportunities for students and teachers to engage in conferring and collaborating as noted in the AP English Literature and Composition course description. Common areas within sightline of classrooms, designed to facilitate break-out sessions will support such opportunities and allow for shared presentations and collaboration among classes. This area needs to be able to the support distributive model for technology (Chromecarts) assigned to each room and opportunities for students to publish (both in print and digitally) and present materials. Additionally, these spaces will provide areas for Professional Learning Communities (PLCs) within the department to meet to collaborate. Within these collaborative spaces there needs to be an area dedicated to supporting professional learning, complete with areas for presentation and modeling classroom strategies.

As part of a humanities program, ELA classes and teachers will benefit from close proximity within the humanities neighborhoods and shared collaborative space with social studies and English Learner (EL) classes and teachers. This will foster cross-curricular collaboration and study as well as supporting interdisciplinary courses such as AP Research and AP Seminar (currently assigned to the social studies department). Such flexible collaborative space and cross-curricular sharing will allow for future expansion in these departments and allow the school to diversify and increase the elective course offerings in order to "foster deeper and broader subject matter exploration in areas relevant to student interests and societal needs" as indicated in the Worcester Public Schools' strategic plan (14.)

Mathematics

The mission of mathematics education in Worcester Public Schools is to provide opportunities for all students to interpret and persevere in solving real world, complex mathematical problems using strategic thinking. Students will be effective communicators and collaborators who construct viable arguments and critique the reasoning of others in order to make decisions, draw conclusions and solve problems.

The Massachusetts Frameworks for Mathematics guides the work of the mathematics department and supports the development of the Mathematically Proficient Person of the Twenty-First Century. This proficiency requires students who are college and career ready in mathematics to demonstrate the academic knowledge, skills, and practices necessary to enter into and succeed in entry-level, credit bearing courses in College Algebra, Introductory College Statistics, or other technical courses. These standards provide for a course of study that prepares students for a science, technology, engineering, or mathematics career by providing pathways for students who want to pursue a mathematics-intensive career or academic major after high school.

Students who meet the standards are able to identify problems, represent problems, justify conclusions, and apply mathematics to practical situations. They gain an understanding of topics and issues by reviewing data and statistical information, develop reasoning and analytical skills, and draw conclusions based on evidence. Students need to be provided multiple opportunities to discuss math's relevance to everyday life, their interests, and potential careers.

John Hattie's research has identified teaching problem-solving as being an effective hinge point (0.68) to accelerate student achievement. The creation of the mathematics classroom and collaborative space, coupled with the project-based learning opportunities afforded by the STEM/STEAM adjacencies listed above will allow us to better prepare each of our students to become the Mathematically Proficient Person in the Twenty First Century.

Doherty Memorial High School offers full year (1 credit) and semester (0.50 credit) courses. The current 1-credit course offerings include Algebra I, Algebra II, Geometry, Pre-Calculus, Calculus, Algebraic Reasoning, Numeracy, Statistics, and Topics in Algebra and Geometry. In addition, there are 0.50-credit offering in MCAS (Massachusetts Comprehensive Assessment System) Math. The Mathematics department currently offers three Advanced Placement courses: Calculus AB, Calculus BC, and Statistics. All are offered as a one-period block. During the 2018-2019 school year, there were three sections of AP mathematics scheduled, serving a total of 78 students.

All students in the school are enrolled in a math class every year and four years of mathematics is a graduation requirement. Students may take additional math courses based on interest (AP Statistics or Financial Literacy), or need (Numeracy, MCAS Math). There are plans to grow the mathematics program by offering courses as part of the Early College High School program in partnership with Worcester State University and/or Quinsigamond Community College. This will provide an additional way to support college and career readiness and offer students an opportunity to participate in more advanced coursework, while earning college credits. Students taking an Early College or dual enrollment course will either enroll in the course during the day in lieu of a regularly scheduled mathematics course, and/or these courses may be offered during non-school hours.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Currently there are eleven rooms predominantly utilized by the mathematics department. Six of these classes are located within the same hallway-referred to as the “math wing”, one is located within the ninth-grade CVTE program area at the other end of the 300s floor, to allow for programmatic adjacency with other core academic courses in the ETA. The remaining four mathematics classrooms are located in other areas of the building, based on where rooms could be allocated to the department.

All rooms used for mathematics classes are outfitted as general education classrooms, mainly comprised of a whiteboard and tablet-arm chairs. The rooms assigned to the math department vary in size and seating capacity. Several rooms utilize a large table with chairs, as this furniture was repurposed from other areas within the school as the student population grew.

The school is built into a hill and as a result, many of the classrooms on the “hill side” of the hallway are below ground level, making them more difficult to heat given our current heating system and causing excessive condensation and dampness in the hot weather.

The vision for the mathematics department space in the new school includes maintaining the department structure for grades 10-12 and includes classrooms of standard size with natural light and appropriate heating. This vision also includes additional classroom and collaborative space to successfully deliver the mathematics curriculum and to grow the programs at Doherty Memorial High School. These classrooms should include flexible spaces that facilitate collaboration and that can adapt and be changed as the curriculum changes. They should include furniture that can be reconfigured for group work and projects rather than the lab tables that are in some of the classrooms.

Epson projectors with more than one display area should be in each math classroom to facilitate the use of technology and a Chromecart should be assigned in each of the classrooms. The classrooms need to be planned with this incorporation of technology in mind and placement should allow for ease of efficient access and flexibility to support a variety of presentation and collaborative experiences.

We anticipate adding space and staff to the math department due to the projected increase in enrollment and the addition of courses such as Financial Literacy and Advanced Quantitative Reasoning to our current course offerings. The district, and school, are seeking to add staff due to expected enrollment increases and due to expanded course offerings. Recent changes to Mass Core have increased graduation requirements which directly impacts course offerings. For example, four years of mathematics is now required for graduation and as a result, there is a need for additional staff in order to offer courses to meet this requirement. Consistent with the goals of the Strategic Plan for Worcester, additional staff is needed in order to expand and to diversify the current course offerings, and to expand the Advanced Placement program. An increase in staff

will allow us to moderate class size to adhere to district staffing ratios and to better serve the needs of all learners. Collaborative space should exist within the department to support the work of the PLC's and to ensure horizontal and vertical articulation and alignment. Additional information regarding projected operating costs, including costs associated with increased staffing, will be included in the Capital Budget statement.

In order to support the advancement of STEM/STEAM programs, the math and science departments will benefit from close proximity and shared collaborative in the STEM/STEAM neighborhood facilitate teachers of the same grade across these departments to implement interdisciplinary project-based learning to demonstrate the relationship between the academic areas and for students to have their learning reinforced in multiple contexts.
This area will provide collaborative space for students to share information gathered and the analysis of the data for their projects and labs for their mathematics classes as well as to present the results of their research and/or lab findings. Such collaborative space and cross-curricular sharing will enable future expansion in STEM/STEAM departments and allow the school to diversify and increase course offerings to support both student interest and need.

Science, Technology and Engineering

The Worcester Public Schools Science and Technology/Engineering (STE) program provides students with in-depth exploration of the standards identified in the Massachusetts: STE Curriculum Frameworks (2016). Support for classroom and after-school activities are enhanced through partnerships with area colleges and cultural, environmental, and scientific institutions. Doherty Memorial High School offers full year (1-credit) and semester (0.50-credit) courses. The current 1-credit course offerings include Biology, Chemistry, Physics, Biology II, Applied Physics: Introduction to Technology, Human Anatomy, and several non-vocational engineering-based courses taught by CVTE teachers. In addition, there are 0.50 credit offerings such as Forensics, an intensive Biology II course, and Environmental Science. The school also runs 5 AP science courses: Biology, Chemistry, Physics 1, Physics 2, and Environmental Science. All science courses have a laboratory-based curriculum.

The Science department currently offers five Advanced Placement science courses: Biology, Chemistry, Environmental Science, Physics 1, and Physics 2. Of these courses Biology, Chemistry and Environmental Science are each designed to be taught during a two- period block. During the 2018-2019 school year, there were eleven sections of AP science scheduled, serving a total of 275 students.

The curriculum in the Science department is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group instruction, modeling of strategies, procedures and experimentation, whole- and small-group

discussion, collaborative activities, project-based exploration of topics, laboratory experimentation, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Currently there are ten rooms predominantly utilized by the science department. Most of these classes are located within the same hallway, though two classrooms are located in different wings of the building. Of these designated science classrooms:

- two have functional lab benches with available sinks, gas, and electric
- six have some variation on lab benches/tables, with one functional sink. These lab benches/tables serve as both a lab surface as well as the students' desk spaces.
- two are outfitted similar to a regular education classroom, with no sink, gas, lab station/bench, or access to electrical connections.

There is a storeroom that has been converted and dedicated to a chemical storage room which also serves as a chemical preparation space. There are two storage rooms located near this chemical storage room: one is a stockroom for the majority of the biology and chemistry equipment, the other houses the materials for physics and the non-CVTE engineering/technology-based courses.

Most of the science classrooms are not designed to effectively support a 21st century STEM curriculum. Rather, most rooms just have rectangular lab tables, as opposed to tablet-arm desks, and a sink at the teacher's desk.

DMHS has a seven- period day, with no rotation or dropped periods. Each classroom is then available for use for seven periods each day. Therefore, there are 56 instructional periods available in a room outfitted to some degree to support a science curriculum, with another fourteen periods available for science staff, though situated in a general education classroom. This is a total of 70 available periods in a 'science' classroom.

During the 2018-2019 school year, there were thirteen FTE staff members providing a combined 65 instructional periods of science. In addition, there were several other non-science classes scheduled into these rooms, due to the available space (e.g. AVID). For the 2018-2019 school year, these ten 'science' rooms had a combined usage rate of 92.8% (65 used periods out of 70 available periods). With the addition of new staff members next year, including one in science, we will be over capacity and will hold more science classes in general education rooms.

The number of available classrooms, combined with their physical layout and available equipment, create deficiencies that challenge the department's attempted delivery of a 21st century STEM education:

- In order to run laboratory activities, teachers often have to switch rooms. For example, if a teacher needs to use a lab space with available electrical outlets, he/she must coordinate with the teacher assigned to that room and identify day(s) where the classes will switch rooms. This switching of classrooms/lab space has a negative impact on instruction as it detracts from effective use of instructional time. This change of classroom environment also disrupts established classroom routines and access to classroom materials.
- Given that each room is used by 2 or more teachers throughout the day, and given that most classes are structured with rectangular tables serving as both lab benches and student desks, teachers are forced to break down or move the lab equipment/class activity materials at the end of each period only to have to set them back up when their next class enters. Teachers cannot leave the activity materials on the lab benches/tables as these double as the desks for students. This creates a loss of instructional time.
- The physical layout and lack of available utilities negatively affect the range of laboratory activity offerings. Teachers are able to plan for a wide range of activities, but can only choose to practically implement a subset of these-a subset that aligns with the limitations of the available utilities.
- The classrooms cannot support a renovation. For example, additional electrical outlets cannot be installed into most classrooms due to the school infrastructure being unable to handle the added load.
- Safety equipment is dated and impractical. Two rooms have emergency showers and eyewash stations. Six have hoses that are coiled and located solely by the main door, often behind desks and lab tables. The regular education classrooms serving as science rooms have no safety equipment, and again staff and students need to move rooms in order to engage in science-based laboratory activities.

As we move into the future, and recognizing the growing importance of a STEM education in providing college and career readiness skills, Doherty Memorial High School needs a facility that enables students to rigorously and authentically engage with the Massachusetts Science Curriculum standards, including the acquisition and development of laboratory skills and practices. A 21st century science education will rely on technology, flexibility, classroom space for students to work collaboratively, and laboratory space designed for a range of curricular offerings. Flexible, yet separated, classroom and laboratory space enables educators to utilize a wide range of instructional practices, including but not limited to discussion groups, direct instruction, peer-to-peer collaboration, demonstrations, virtual simulations, laboratory investigations, inquiry-based learning activities, personalized groupings, individual work, etc. These flexible spaces will support several variations of organization to address current and future needs. This includes Grade 9 teams, with Grades 10-12 pairings between departments: for

example, the English and Social Studies departments would be paired, while Mathematics and Science would also form a departmental pairing.

Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

In 2018, the STEM Learning Design, LLC released a report outlining recommendations for the physical design and utilization of effective K-12 STEM learning spaces. Many of these recommendations have been adopted within recent new school designs, and the physical space considerations for science classrooms and associated spaces would likely adhere to the identified best practices within this report. For example, when designing the building space, Doherty would include such recommendations as ensuring that spaces 'support (a) comprehensive approach to health and hygiene as well as active STEM learning activities, including project-based learning.' (p. 19). Classrooms and associated spaces would include effectively designed storage options for student work, materials, classroom resources, etc.

Social Studies

The vision of the 2018 Massachusetts Department of Elementary and Secondary Education Frameworks for History and Social Studies is that students will be "educated in the histories of the Commonwealth, the United States, and the world. They will be prepared to make informed civic choices and assume their responsibility for strengthening equality, justice, and liberty in and beyond the United States" (p.9).

Doherty Memorial High School offers a variety of full year (1-credit) and semester (0.50-credit) courses in social studies. The current 1-credit social studies course offerings include World History II, U.S. History I-II, Psychology, Sociology, Legal Aspects, Advanced Placement (AP) World History, AP U.S. History, AP Psychology, AP Human Geography, AP Government and Politics, AP Seminar and AP Research. Criminal Justice is a semester-long 0.50 credit course.

Students are required to take a minimum of three years of history/social studies classes in order to graduate, and all students in the school are required to take World History II, U.S. History I, and U.S. History II Students may choose to take social studies electives and/or AP courses. Additionally, Students Involved in Their Education (SITE), a student internship program, has also been a part of the social studies department. Currently there are 10 rooms predominantly utilized by the Social Studies department. Eight of these classes are located within the same hallway-referred to as the Social Studies wing, and the other two are located within the ninth

grade ETA program area. Teachers travel between classrooms during the day to teach their classes.

Each classroom is available for use for seven periods each day. Therefore, there are 70 instructional periods available in a room outfitted to some degree to support a social studies curriculum. During the 2018-2019 school year, there were 14 FTE staff members. Most teachers within the department provided social studies instruction, though several offered general, non-departmentalized elective courses as part of their assignment (e.g. AP Capstone courses, Internship Coordinator). In total, these staff provided a combined 66 instructional periods of social studies and general electives. In addition, there were several other non-social studies classes scheduled into these rooms, due to classroom availability at specific times of the day DMHS has a 7-period day, with no rotation or dropped periods. Each classroom is then available for use for 7 periods each day. Therefore, there are 70 instructional periods available in a room outfitted to some degree to support a social studies curriculum.

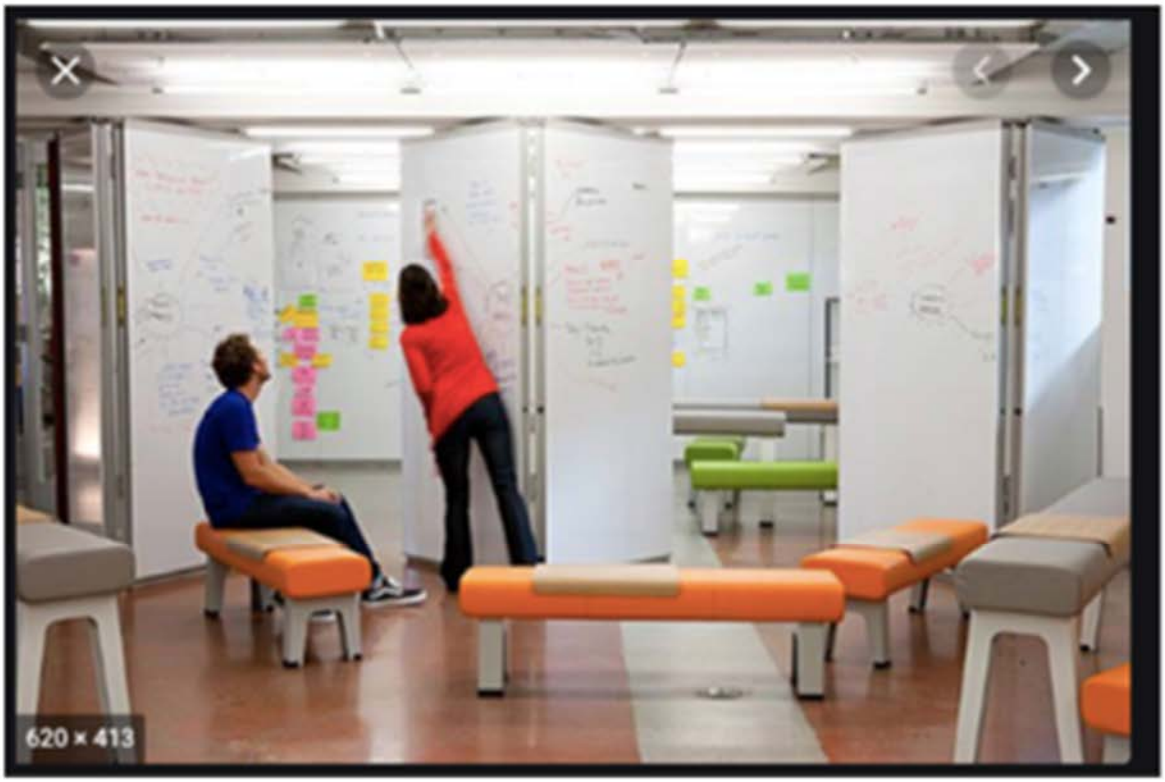
During the 2018-2019 school year, there were 14 FTE staff members. Most teachers within the department provided social studies instruction, though several offered general, non-departmentalized elective courses as part of their assignment (e.g. AP Capstone courses, Internship Coordinator). In addition, there were several other non-social studies classes (e.g. AP Capstone courses, Health, ELA) scheduled into these rooms, due to the available space. For the 2018-2019 school year, these 10 'social studies' rooms had a combined usage rate of 97% (68 used periods out of 70 available periods). With the addition of new staff members to the department next year, and the addition of new courses, there will be a lack of available classroom space within the social studies wing, requiring classes to be scheduled in available rooms outside of the department area. As enrollment increases and the department continues to grow with additional staff and course offerings the school will be challenged to find appropriate classroom space to meet these needs.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, whole- and small-group discussion such as Socratic Seminars and debates, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis

Most of the Social Studies classrooms are not designed to effectively support a 21st century integrated humanities curriculum. The physical layout of these rooms discourages effective grouping practices, collaborative work, and flexibility. All are outfitted as general education

classrooms, mainly comprised of a whiteboard and tablet-arm chairs. One classroom (409) is only 730 square feet.

The vision for the social studies department space in the new school includes maintaining the department structure for grades ten through twelve and having classrooms of standard size with natural light and appropriate heat, cooling and ventilation as conversational doors between rooms to support collaborations. There is a need for additional classroom and collaboration space to successfully deliver the social studies curriculum and grow the programs at Doherty Memorial High School. Collaborative space is needed to support increased opportunities to support students to "learn to think critically, construct solid arguments, and see many sides of an issue—skills that prepare them for college and beyond" (AP U.S. History Course and Exam Description p.1). Common areas within sightline of classrooms, designed to facilitate break-out sessions will support such opportunities and allow for shared presentations and collaboration among classes. This area needs to be able to support flexible use of technology (Chromecarts) and opportunities for students to publish (both in print and digitally) and present materials. Additionally, these spaces will provide areas for Professional Learning Communities (PLCs) within the department to meet to collaborate. These areas will allow for flexible orientations, and will have flexible furnishings to account for current and future needs. There are no specialized acoustical requirements beyond the acoustical classroom separations planned for the school. We anticipate using materials, for example whiteboard walls that pivot (see image below), that provide visual privacy when needed.



Within these collaborative spaces there needs to be an area dedicated to supporting professional learning, complete with areas for presentation and modeling classroom strategies. With the addition of an Internship/Community Service Coordinator position beginning in the 2019-20 school year, all student internships in the school will be developed and monitored by the coordinator and no longer supervised by a member of the social studies department as was the case historically. The coordinator will need a space to meet with students as a part of the new facility design.

As part of a humanities program, social studies classes and teachers will benefit from being in a neighborhood in close proximity and shared collaborative space with ELA and EL classes and teachers. This will foster cross-curricular collaboration and study as well as support interdisciplinary courses such as AP Research and AP Seminar (currently assigned to the social studies department). Such flexible collaborative space and cross-curricular sharing will allow for future expansion in the humanities departments and allow the school to diversify and increase the elective course offerings in order to “foster deeper and broader subject matter exploration in

areas relevant to student interests and societal needs" as indicated in the district's strategic plan (14.)

World Languages

The goal of the Worcester Public Schools World Language program is to promote language proficiency in order for students to engage in meaningful communication and to appreciate cultures different from their own. This program is founded on the belief of the Massachusetts Common Core of Learning that all students should converse, read, and write in at least one other language in addition to English.

The mission of the World Language department states that at every level of world language instruction, students communicate will communicate in the interpretive, interpersonal, and presentational modes in the target languages. Students will gain an understanding of the target language and target culture by making comparisons and connections to their own language and culture and apply the skills and knowledge acquired in future career and life experiences.

Students must successfully complete two years of the same language in order to graduate from the Worcester Public Schools, with the exception of vocational students and some students with disabilities if their Individualized Educational Plan is written with that exception.
Doherty Memorial High School offers a variety of full year (1 credit) courses in World Languages including French I-IV, Latin I-IV, Spanish I-IV, Spanish Native Speaker, and Advanced Placement Spanish Language.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies and oral and written use of the target language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to research the culture and history of the countries associated with the target language and to practice speaking and listening skills using Audacity, a multi-track audio editor and recorder. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Currently at Doherty, world language courses are taught in seven classrooms, five of which are located in the world language wing on the fourth floor and two located in close proximity on the fourth floor. Prior to 2018-19, room 422 was a dedicated space, akin to a Global Learning Lab, used as a language lab for the World Language department. This space contained desktop computers and provided opportunities for classes to use Audacity program to support their

speaking and listening skills in their target language. The desktop computers included specialized software to enable students to integrate technology as they engaged with the curriculum. Students were using the distributive technology to research the culture and history of the countries associated with the target language, to practice their speaking and listening skills using a multi- track audio editor and recorder computerized program, and to practice for and ultimately take the speaking component of the Advanced Placement Language (Spanish) exam.

Unfortunately, due to the overcrowding issues at the school this space has been converted to a classroom beginning in 2018-19 and is now used by various departments to provide much needed classroom space. While the loss of the Global Learning (computer) lab was offset by the purchase of Chromebooks, the Chromebook technology – due to software and hardware incompatibility – is not sufficient to enable all necessary curricular activities to occur.

The vision for the World Language department space in the new school includes maintaining the department structure and includes classrooms of standard size with natural light and appropriate heat, cooling and ventilation as conversational doors between rooms to support collaborations. There is a need for additional classroom and collaboration space to successfully deliver the World Language curriculum and grow the programs at Doherty Memorial High School. Collaborative space is needed to support increased opportunities for students to engage in speaking and listening activities such as plays, presentations, and cultural activities.

Common areas within sightline of classrooms, designed to facilitate break-out sessions will support such opportunities and allow for shared presentations and collaboration among classes. This area needs to be able to support flexible use of technology (Chromecarts) assigned to each room and opportunities for students to publish (both in print and digitally) and present materials. These areas will allow for flexible orientations, and will have flexible furnishings to account for current and future needs. There are no specialized acoustical requirements beyond the acoustical classroom separations planned for the school. We anticipate using materials, for example whiteboard walls that pivot, that provide visual privacy when needed. Additionally, these spaces will provide areas for Professional Learning Communities (PLCs) within the department to meet to collaborate. Within these collaborative spaces there needs to be an area dedicated to supporting professional learning, complete with areas for presentation and modeling classroom strategies.

Effective foreign language programs integrate the study of language with the study of culture which includes daily life, history, literature, visual and performing arts, mathematics, and science. In this way, foreign language programs create natural links to all other disciplines. As part of a humanities program, World Language classes and teachers will benefit from close

proximity to the departments in the humanities. This will foster cross-curricular collaboration and study as well as supporting interdisciplinary courses.

The vision for the new school also includes expansion of the course offerings to include AP Spanish Literature and restoration of the Global Learning Lab to this department. A dedicated Global Learning lab, utilized primarily by the World Languages department, will provide increased opportunities for students to enhance their speaking and listening skills in their target language. If available, other classes requiring the available technology could certainly benefit from this space. The World Language Department Chair will be responsible for maintaining the schedule and coordinating the logistics of use of the space.

The world language teachers work to effectively meet the needs of our diverse community of learners using various instructional and assessment practices as they provide differentiated support to those who are new to the study of World Languages, Native Speakers and AP students alike. The addition/replacement of the language lab will greatly support their valiant efforts and help us celebrate the diversity of our community and as we learn about other cultures. The lab will be staffed by licensed teachers and the department chair will oversee the scheduling of the lab.

The use of student-centered Global Language lab activities and assessments supports the gradual release of responsibility as students develop target-language proficiency and confidence through authentic listening activities, listen and respond recording tasks, pair dialoguing, and interactive web-based activities. The lab will allow students to record and listen to themselves speaking in the target-language so they can learn to self-evaluate and self-correct. Students will have the opportunity to participate in engaging, project-based learning activities such as presentations, plays, and video projects.

The restoration of the Global Language lab will support student fluency essential for preparation for the AP exam earning the Seal of Biliteracy. The State Seal of Biliteracy is an award provided by state approved districts that recognizes high school graduates who attain high functional and academic levels of proficiency in English and a foreign language in recognition of having studied and attained proficiency in two or more languages by high school graduation. The vision for awarding this seal is to help students recognize the value of their academic success and for see the tangible benefits of being bilingual as is benefits college and career readiness. The MA Seal of Biliteracy, adopted from the state, takes the form of a seal that appears on the transcript and diploma of the graduating senior. This recognition may be presented to colleges and future employers.

Increased opportunities for student achievement and for students to take increased responsibility for their own learning are consistent with the emphasis on the gradual release of responsibility

for students as they move through the years and is consistent with the skills needed for them to be lifelong learners.

English Learner Classes

The English Learner program in the Worcester Public Schools supports the implementation of Sheltered English Immersion with fidelity to promote English language acquisition by acceleration for all English learners in the district and to bring the opportunity of bilingualism/multilingualism to as many students as possible.

Doherty Memorial High School serves a diverse population of students who represent a range of native languages.

Table 7

2019-20 Student Counts by Native Language, ELL numbers		
Native Language	Students	ELL Students
English	709	0
Spanish	361	170
Albanian	88	7
Vietnamese	56	3
Twi	45	17
Arabic	41	24
Portuguese	34	18

Miscellaneous languages	29	6
Nepali	18	8
Swahili	17	8
Greek	12	0
French Patois	7	0
French	6	2
Russian	5	1
Rundi	5	2
Somali	4	2
Creoles & Pidgins (French)	4	2
Polish	3	0
Khmer/Khmai	3	0
Faroese	3	1
Haitian French Creole	3	3
Armenian	2	0

Kinyarwandu	2	1
Kongo	2	2
Ewe	1	0
Amharic	1	0
Urdu	1	0
Undetermined	1	0
Chinese	1	0
Tigrinya	1	1
Slovenian	1	0
Sango (Ubangi Creole)	1	1
Philippine (Other)	1	1
Persian	1	0
Ga	1	0
Ganda	1	0
Niger-Kordofanian (Other)	1	0

Creoles & Pidgins (Portuguese)	1	0
	1473	280

Doherty Memorial High School offers a variety of full year (1 credit) courses that support English Learners in an effort to support English language acquisition. The English Learners department has three teachers who provided a combined 15 instructional periods of language development and only two classrooms dedicated to EL instruction with one classroom on the fourth floor and one on the third floor. Teachers must travel between rooms for different class periods. DMHS has a seven- period day, with no rotation or dropped periods. Each classroom is available for use for seven periods each day. Therefore, there are 14 instructional periods in the designated EL classrooms. During the 2018-2019 school year, these two 'EL' rooms had a combined usage rate of 100% (fourteen used periods out of fourteen available periods). In addition, there were several other non-departmental classes scheduled into these rooms, due to the available space (e.g. Social Studies, ELA, Science). With the increasing enrollment of EL students, additional space is needed to provide instruction to support English language acquisition.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners as they develop English fluency. Instructional methods include whole-and small-group - instruction, modeling of and oral and written use of the English language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills While this is the goal in all classes in the ELL department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Neither English Language Learner classroom is designed to effectively support a 21st century language development curriculum. The physical layout of these rooms discourages effective grouping practices, collaborative work, and flexibility. Both are laid out as general education classrooms comprised of a whiteboard, and tablet-arm chairs.

Curriculum in the EL classes is delivered using a variety of instructional methodologies including but not limited to whole-group instruction and modeling, and whole-group and small group discussion and collaboration that supports the school's focus on reading critically and responding thoughtfully in writing. Classes utilize technology in a variety of ways including the use of video and audio to support critical response, document cameras for modeling and

collaboration, and Chromebooks (Chromecarts) for research, collaboration, writing, and publication. The school works to advance the mission of the Worcester Public Schools Office of English Learners "to support the implementation of Sheltered English Immersion with fidelity to promote English language acquisition by acceleration for all English learners in the district and to bring the opportunity of bilingualism/multilingualism to as many students as possible."

The vision for the English Learner department space in the new school includes additional classroom and collaboration space to successfully deliver the EL curriculum and grow the programs at Doherty Memorial High School to meet the needs of the many English Learners in the school. Collaborative space is needed to support increased opportunities for students to work in peer groups and in small groups with a teacher to engage in academic discourse, reading, writing, and presentations to support their language acquisition. Students will benefit from close proximity to the ~~English and Social Studies neighborhoods~~ core academic classrooms/neighbors to allow for shared collaborative space and opportunities for modeling, EL support and which will help to increase equity and access to other courses in ~~the humanities~~ all core academic departments.

College and Career Readiness

Beginning in the 2018-19 school year all grade 9 students are required to participate in a ten-week course focused on college and career readiness, earning 0.25 credit upon successful completion of the course. The lessons in the Introduction to College and Career Readiness course incorporate lessons from Naviance and are designed to assist students in creating and maintaining a plan for their individual and personal educational plans or MyCap. The lessons include time-management exercises, self-awareness activities, interest inventories and college and career exploration lessons.

Beginning in the 2019-20 school year, all grade 10 students are required to participate in College and Career Readiness II and will earn 0.25 credit upon successful completion of the course. The lessons for the tenth-grade students represent a continuation of the introductory course and increase the breadth and depth of these exploration activities and support the further development of their individual plans for high school while increasing each student's knowledge of postsecondary options based upon their career interests.

Academic Support Programming Spaces

Doherty Memorial High School provides a variety of academic support programs for students during the school day as well as after school and on Saturdays. Students enrolled in the courses such as Academic Literacy, Numeracy, AVID, and Study Skills participated in these classes

during the school day. After-school classes and Saturday workshops are available throughout the year and to support students to prepare for the English, Math, and Science MCAS exam. Additionally, AP students participate in Saturday practice exam sessions at different points in the year to help them prepare for the end-of course AP exam.

Academic Literacy

Academic Literacy I-IV is offered to provide a double dose of English to support students with identified needs. In this course, offered through the ELA department, students learn to appreciate the varied reasons for reading; discuss texts as a community of readers; and apply comprehension strategies to academic texts. Students engage in activities that increase or improve reading comprehension, reading technique, vocabulary acquisition, and general literacy skills.

These classes are currently taught by members of the ELA department and are located in the ELA wing, as space allows. The vision for the new school is to continue to offer these classes in grades 10-12 ELA neighborhood and to locate Academic Literacy I classes in or within close proximity to the Ninth-Grade Academy.

Numeracy

Numeracy is offered to provide a double dose of math to support students with identified needs. In this course, offered through the Mathematics department, students strengthen foundational math skills and increase their understanding of Algebra I by addressing properties of rational numbers (i.e., number theory), ratio, proportion, estimation, exponents and radicals, the rectangular coordinate system, formulas, and solving and graphing linear equations and inequalities.

These classes are currently taught by members of the Mathematics department and are located in the Mathematics wing, as space allows. The vision for the new school is to continue to offer these classes in the Mathematics neighborhood as well as within close proximity to the Ninth-Grade Academy.

Advancement Via Individual Determination (AVID)

The Worcester Public Schools supports the implementation of AVID's (Advancement Via Individual Determination [AVID])mission to close the achievement gap by preparing all students for college readiness and success in a global society. Doherty Memorial High School

offers full year (1 credit) and a semester (0.50 credit) courses Advancement Via Individual Determination (AVID) Elective course. AVID I-IV are 1 credit courses and AVID 1 Pt. 1 is a 0.50 credit course. Most students enter the high school AVID program in the ninth grade and stay in the program through graduation.

AVID supports students who are motivated and have the desire to excel and attend college but need additional support (academic, social, and emotional) to prepare them to be college and career ready. Many of the students are the first in their family to attend college and/or are members of groups that are often underrepresented in higher education. Students in the AVID program participate in the AVID Elective course each year. During the 2018-19 school year the semester-long AVID 1 Part 1 course was offered in order to provide these valuable academic and collaborative skills and supports to students who are not in the AVID Elective courses/AVID program (AVID).

Collaboration and the ability to utilize flexible grouping is an essential part of the AVID curriculum. "Students would rather talk, move around, and ask questions than sit still and be quiet. Humans are wired to construct knowledge through action. AVID classrooms promote motion, communication, and team building through activities such as Socratic Seminars, Collaborative Study Groups, peer tutoring, and Philosophical Chairs. These activities honor the way students learn best" (AVID).

Each week, AVID Elective students participate in collaborative study sessions (tutorials) in which they use critical thinking, collaborative inquiry, and academic discourse skills to explore and solve Points of Confusion (P.O.C.) from different academic content areas. Students receive additional support during this process from AVID tutors. These tutors are community volunteers. Generational tutors are community members, often retirees, who volunteer their time and their expertise to help guide students through the tutorial process. In addition, AVID programs in the district partner with colleges in Worcester and to provide additional tutors to support AVID students. This combination of tutors provides students with varying perspectives and the opportunity to interact with members of our community.

The AVID program requires and benefits from community-based tutors. Like all other visitors, these tutors will be permitted access to the building through our main office entry and will be permitted access to the AVID classroom only. The school currently implements protocols regarding visitor access, including parent/guardian(s) and other community members. These protocols limits visitor access to the room (office, classroom, etc.) applicable to their visit only.

In addition to classroom space for whole group instruction and frequent guest speakers, the AVID classroom is arranged to provide small group collaborative work areas in order to support

the tutorial process every Tuesday and Thursday, the current classroom configuration limits the ability to successfully create these collaborative spaces. Students currently use small white boards to present their P.O.C. and furniture must be rearranged for each group for each session. The AVID curriculum also includes instructional methodologies that promote reflective academic discourse and AVID classes frequently participate in activities such as Socratic Seminars, Philosophical Chairs, Gallery Walks and other whole-class participatory activities. An additional part of the AVID curriculum includes collaborative team building activities that often require space for student participation.

The vision for the AVID program space in the new school includes collaboration space to successfully deliver the AVID curriculum and grow the program at Doherty Memorial High School. Currently, there is only one designated classroom AVID classroom and due to the lack of available classrooms in the current building, there is a need to schedule other classes in the room when there is not an AVID class. This posed a challenge when the opportunity arose to add a section of AVID I Part 1 second semester and as a result of previous classroom scheduling this class this had to be placed in a science room that lacked appropriate spaces for the collaborative process. In order to successfully engage in collaborative inquiry, students need space to gather in small groups with tutors (the ideal student: teacher ratio is 7:1) complete with access to technology and white board space to post P.O.C.s and work through the tutorial process. Ideally, the AVID program would like to be able to serve at minimum, ten percent or our school population. The current lack of space impacts the ability to expand the program and to offer additional sections of AVID (Table 8). The ten percent of Grade 10 students served in 2019 is reflective of the addition of the AVID 1 Part 1 course but the students in that course had limited collaborative space. Only 51% of the Grade 10 students in AVID classes (either AVID II elective or AVID 1Part 1) were able to participate in AVID in a classroom with at least limited collaborative space.

Table 8

PERCENTAGE OF ALL STUDENTS IN EACH GRADE AT AVID SCHOOLS, ENROLLED IN THE AVID ELECTIVE

	9th Grade	10th Grade	11th Grade	12th Grade
2019	7%	10%	6%	5%
2018	7%	7%	6%	7%
2017	7%	7%	6%	6%

AVID strategies are not limited to the AVID Elective class. “The power of AVID Secondary is the ability to impact students in the AVID Elective class *and* all students throughout the campus. AVID Secondary can have an effect on the entire school by providing classroom activities, teaching practices, and academic behaviors that can be incorporated into any classroom to improve engagement and success for all students. Teachers can take what they've learned at AVID training back to any classroom to help all students, not just those in AVID, to become more college- and career-ready”(AVID). This link between AVID and professional learning opportunities for staff necessitates areas for collaboration, modeling, and access to the AVID library and resources for all staff members including members of the AVID Site Team. The ideal space would allow for space for modeling and co-teaching opportunities to support gradual release and effective utilization of AVID strategies to support academic success and promote college and career readiness.

Study Skills

Study Skills classes are offered through the Special Education Department to support students with identified needs. These year-long courses are taught by members of the Special Education department. (See full description in Special Education section.)

Student Guidance and Support Services

The mission and purpose of the Worcester Public School Guidance Counselor Department is to advocate for every student and provide a comprehensive guidance program that will assist all students in acquiring the knowledge and skills needed to become career and college ready. The program is based on the Massachusetts Model for Comprehensive School Counseling. School counselors take a systematic approach to deliver a standards-based curriculum to all middle and high school students through individual counseling, small group counseling and classroom guidance lessons to facilitate student learning and development in three domains: personal/social development, academic/technical achievement, and workplace readiness/career planning.

The Guidance Department houses staff members who provide a variety of support services to our students. In past years, Doherty has had five guidance counselors. Beginning in 2019-20, there will be six guidance counselors at DMHS to meet increasing enrollment and growing student need and to bring us closer to the American School Counselor Association and the Massachusetts School Counselors Association recommended ratio of students to counselor of 250:1. The number of guidance counselors will likely increase due to the projected increased enrollment in the new facility. These counselors work with students and their families to evaluate academic needs, refer students for evaluation and identify appropriate academic support, provide

social/emotional information and provide short and long term counseling/support, communicate with families and assist with facilitating school-to-home/home-to-school communication, and support college and career readiness preparation.

Doherty has two full time school adjustment counselors, and one part-time school adjustment counselor who focus primarily on providing short- and long- term counseling and crisis intervention for students, act as liaisons between parents, students, and teachers regarding student needs, referring students for community-based mental health and counseling services, and monitoring student attendance. Additionally, there is a school psychologist whose responsibilities center on the assessment of students' academic, social-emotional and behavioral needs, communication with parents and community providers regarding student needs, and providing consultation to teachers and administrators regarding student needs.

Guidance counselors meet in both large and small groups in academic classrooms and in the Guidance Conference room to discuss topics related to college and career readiness. Counselors utilize Naviance, a college and career readiness program that allows students to create a personalized plan that helps them make the right decisions throughout their academic journey, as a tool which provides parents and students access to the portal.

The current Guidance Office has a counter in front of the guidance secretary's desk. The guidance secretary serves as a greeter for the department welcoming students, parents and college/career representatives, handles all incoming phone calls, helps to schedule appointments and visits in the office and organizes and tracks both current and past student cumulative records. Doherty also serves as the repository of the school records/transcripts for both Classical High School (the predecessor of Doherty Memorial High School) and Commerce High school. These older transcripts/records are currently housed outside of the Guidance Office, in the office of the Instructional Coach.

The central part of the Guidance office also contains a small conference table which serves as a waiting area for students, parents, and other visitors. Currently there are six private offices in this area that are used for three of the guidance counselors, the two school adjustment counselors, and the MassEdCo representative who is assigned to our school to work with students and families to support the college application and financial aid process. There is a small work area behind the guidance secretary that is used for guidance -related materials and the photocopier for the department. This is also used as access to the head counselor's office. The other two guidance counselors have offices in the guidance conference room. These offices have portable walls and do not allow for private meetings with students or parents. The conference room contains tables, arranged in an oval, and seating for fifteen people. This area is used for presentations, meetings with college/career representatives, parent meetings, and as a student workspace. While this space is flexible, it is not adequate for many of its intended uses. This

conference area does not provide private/confidential space for meetings with parents or specialists. For example, Individual Education Plan (IEP) meetings, which involve Special Education staff, guidance counselors, administrators, and other support staff, are held in the conference area in room 309 (the administrative suite that houses two of the assistant principals' offices) because it ensures more privacy.

The space is not large enough for many of the college/career presentations that need to be scheduled or for whole-class lessons with guidance counselors. Additionally, there are no other spaces for teachers to meet with parents or to make phone calls to parents that provide privacy. This area is often used with students to engage in online college/career exploration utilizing Naviance or work on PLATO (online credit recovery program). With the addition of office space for the sixth guidance counselor beginning in August 2019, there will be even less space available for these purposes.

The vision of the Guidance Suite for the new school is to provide a central location for information, college/career explorations, advising and support. The vision for the Guidance and Support Service Office space in the new school includes private office space, classroom, meeting and collaboration space and a career center to successfully support student needs and provide programs to foster college and career readiness. The proposed Guidance Suite would benefit from proximity to the main entrance for ease of access to the office and services by families, college/ career representatives, and other support service providers. Additionally, adjacency to the other administrative offices will facilitate collaboration among different student supports.

This proposed Guidance Suite will include a welcome center within the front part of the suite with space for the guidance secretary to greet visitors, answer questions, and direct and monitor the flow of phone calls and foot traffic through the office. There is also a need for a waiting area with ample room to accommodate students, college/career representatives, and families. There is a need for flexible collaborative space that can be used for small- group meetings such as enrolling new students or parent-teacher conferences.

Each counselor will need an office which can allow for private meetings and be large enough to include students, parents, appropriate students support personnel, and an interpreter. While there will be six guidance counselors beginning in 2019-20 school year, the office needs to be flexible to accommodate any increase in staff that may be needed to support any increase enrollment and to allow the counselors to stay within the 250 : 1 ratio as recommended by Massachusetts Model for Comprehensive School Counseling.

Private meeting space is an essential part of the Guidance Suite in order to provide emotional safety for students and allow for confidential meetings with students, parents and support

personnel. Flexibility within this suite will allow for expansion of these roles should they been required to meet student needs and enrollment. Additional private office/meeting space is needed for programs such as MassEdco which provides college and financial aid counseling to students and families.

The suite needs to be designed in a way that it promotes a sense of emotional security and is a safe space for all students with ease of access to counselors, resources and a place where they can regroup and refocus within visibility of counselors.

Flexible conference/collaborative space is needed for meetings and presentations by college/career representatives; a large conference room/presentation space with seating for 30-40 people and a smaller conference room/presentation space with seating for twenty people. Each space should be equipped with whiteboards, projectors and other appropriate technology. This space can also be used as instructional space to support the delivery of the curriculum as recommended in the Massachusetts Model for Comprehensive School Counseling.

During the course of the day, there is a need for multiple meeting spaces to accommodate the range of presentations that can occur simultaneously. Colleges visit the school and host information sessions for students during the school day. A large conference room which can accommodate 30-40 people will allow for these types of informational and instructional sessions within the school day. Additional group meetings such as IEP meetings, and team meetings such as the Graduation Improvement Team, Attendance Team, and the Instructional Leadership Team, meet throughout the day. These groups require a private meeting space that can accommodate these groups, which often have 15-18 members. Two separate conference rooms/meeting spaces will allow for these programs and meetings to occur simultaneously without limiting the instructional/informational opportunities for students. Due to current limitations, Doherty often does not host district-level professional development or district-based administrative meetings: flexible and variable conference and presentation space will allow Doherty to benefit from visitors and trainers.

When considering the use of these proposed spaces, and possibilities for shared usage, it was determined that the Guidance department can utilize the Career Center space for the 30-40 person meetings, but will require a smaller private conference space for 15-18 people. This will be reflected in the updated PSR Space Summary.

In all spaces, there needs to be reliable and consistent access to technology not only in each individual office area but throughout the entire suite to support the use of technology for activities such as MyCap (My Career and Academic Plan) and Naviance to support academic and career planning process, and PLATO The suite needs to include space with easy access to

resource materials for students and access to technology/printing for applications, resources, and other similar materials.

Currently, many Doherty students participate in work-experience or internship placements. Doherty is planning for a dedicated space, designated as a Job Placement Office, for the staff member assigned to assist these students in their off-site placements, as well as to liaise with community members working with Doherty students. Doherty currently offers several credit-earning options for non-vocational students and so this office space is not intended exclusively for the Chapter 74 programs. For example, the SITE program (Students Involved in Their Education) allows students to leave school at the end of the day to participate in an unpaid internship within a local business or organization. Students with a job who complete certain requirements are eligible to earn credit and many of them work to help to support their families. The Job Placement Office established a common location for students, staff and community members to access information about these options and to utilize the support provided.

Students within the vocational programs participate in internship opportunities independent of the SITE or Work-Experience programs.

The Guidance Suite needs space dedicated to safe and secure storage of student academic records, including the repository of records that need to be stored and accessible at the school. The school is a repository for school records for Doherty, Classical High School (the predecessor of Doherty) and Commerce High School. In keeping with the intent of 603 CMR 23.06, the time limit for destruction of the record should probably be not less than sixty years and therefore appropriate safe space to archive these records needs to be included in the Guidance Suite.

Student Support

Health Center

The Worcester Public Schools partners with Family Health Center to operate a School Based Health Center at Doherty Memorial High School. As noted in the Family Guide and Community Resources document (Appendix D) “Health Centers are staffed by agency personnel as well as a WPS School Nurse and School Adjustment Counselor. The School-Based Health Centers provide students with necessary health care: physicals for school, work or sports; treatment of illness; first aid; emergency care; immunization and/or health education. In order to receive services from the partner health order to receive services from the partner health agency at the school, parents/guardians must complete and return to school a signed enrollment form. This is available at the school. When appropriate, health insurance companies of the families will be

billed. No one will be denied services if unable to pay" (Family Guide and Community Resources, 2017, p.18).

Currently, the health center is staffed by two nurses and the School Based Health Center is staffed by a nurse practitioner, an administrative assistant and a behavioral specialist. The area within which they work is not large enough to adequately support this important function a school as large as Doherty. There is no private waiting area for students who are waiting to be seen by either one of the nurses or the nurse practitioner. There is insufficient space for the school nurses to make phone calls to parents or agencies about student's health issues. There are only two exam rooms and they are quite small in size with inadequate storage for medical supplies. The nurse practitioner, who is employed by Family Health, faces similar situations as she has only one small exam area within which to work and an office that barely fits one person. Despite these crowded conditions, during the 2018-19 school year, the staff of the health center saw and treated 1,253 students at least one time and the School Based Health Center, SBHC, staff had 4,000 visits, 3,100 for medical issues and 900 visits for behavioral health reasons and involving 398 students. During the 2018-19 school year, there were 750 students at the school who were members of the health center which represents nearly 50% of the school population.

The school nurses' responsibilities are extensive. They administer medication, evaluate students and staff who visit the health center, triage illnesses, injuries and health concerns and respond to medical emergencies throughout the school. The school nurses provide screening for height, weight, and BMI, vision and hearing, and they engage in Screening, Brief Intervention and Referral to Treatment (SBIRT), an evidence-based practices used to identify, reduce and prevent problematic use, abuse, and dependence on alcohol and illicit drugs. The nurses conduct these SBIRT screenings in the hopes of referring students who may be experimenting with drugs, alcohol, and/or have mental health issues to intervention programs. The school nurses collaborate with the district nursing department, other healthcare providers, and families to address the physical and mental health needs of our students.

The nurse practitioner provides additional treatment to students who are members of the School-Based Health Center, SBHC. She also works with families and other health care providers to meet the needs of our student population by conducting annual physicals to students and treating a variety of conditions. The behavioral specialist also employed by Family Health works collaboratively with our staff and students to help to address the mental health needs of health center members. The nurses and the SBHC staff maintain records and complete injury reports and other documentation to support our student's health and wellness.

The vision for the new school is to provide ample space for three nurses and the SBHC staff to complete their work. Due to the increased enrollment and the extensive use of this space, the number of nurses will increase from our current staffing of two to three. This area would include

adequate exam room space, a waiting area that is large enough to avoid the spreading of germs, office space to be able to communicate with parents and providers while maintaining and respecting confidentiality and privacy issues about student's health issues and a small conference room to meet with families to discuss medical issues privately, and to be able to provide small group therapy and a lactation space for nursing mothers. Additionally, an increased number of bathrooms, including one to gather specimens, and one that includes a shower. This space should include a larger resting area, a break area for any student who needs to relax or those who may be dysregulated, and a space for diabetic students to test and to eat if need be according to their levels. There also needs to be a sufficient office for the administrative assistant to support the work of the nurse practitioner and multiple exam rooms for the nurse practitioner to treat students who are members of the center. The behavioral specialist needs a space to be able to meet with students that is large enough to support counseling services, to provide urgent mental health evaluations and to support ongoing therapy. There is also a need for additional storage in the health suite for medical supplies.

Additionally, despite our best-efforts to treat students at school, there are certain situations that warrant calling 911 and having our students transported to the hospital for more care and therefore, we request that there be access to the outside of the building that is handicapped accessible and near a driveway in order for Emergency Medical Services to be able to transport these acute cases of medical need to the hospital without having to travel with students on a stretcher and/or wheelchairs throughout the building. The nurse's suite and the gymnasium are areas that these types of emergencies seem to occur more frequently. An exterior entrance will also support the SBHC being accessible after school hours and possibly to other family members of our students and other members of the community should this expansion occur. There is a need for space in the health suite to incorporate a food pantry and a clothing outlet to better meet the needs of our students and their families. Historically, all clothing donations have been kept in an area of the guidance office and students have accessed a variety of clothing items for themselves and for their families. This space has been limited to one wardrobe closet. The adjustment counselors have distributed food and grocery gift cards to families particularly during the holidays but there is a need for a more consistent provision of food items than we have been able to address. In the new school, we envision a space for food and clothing distribution as a part of the health center. These areas will be maintained by our community partners, staff donations and service-learning initiatives.

E. Teacher Planning

Each teacher is scheduled for one preparation period each day. This provides teachers with the opportunity to design materials and plan instruction to support the delivery of the curriculum in accordance with DESE curriculum frameworks. Teachers utilize ATLAS, the district's online platform which provides access to curriculum frameworks, curriculum maps, curriculum

resources, and other course-specific information to help with this work. In order to access ATLAS and to facilitate instructional planning teaches need a dedicated space with access to technology and other professional learning materials/supports. Currently there is a teacher workroom on the third floor which has a worktable for individual and collaborative work, as well as access to a telephone for teacher use. This workroom is flanked by two teachers' rooms each of which provide a small area for staff lunch and can also be used for teacher preparation space, however, access to this space is impacted during staff lunch periods. Teachers may also use the library/media center for teacher preparation, but this area is also used by individual students and by classes which can limit the availability of space for individual and collaborative work.

Members of both the Grade 9 and Grade 10 teams in the ETA meet two days a week for collaborative planning. This common planning time is built into their schedule as part of their assigned duty. Currently, they hold these sessions in room 200/conference room. Quite often, however, their meeting/collaborative planning session must be relocated in order to accommodate another meeting that needs to be held in the conference room. As a result, these teams must seek alternate space within the building.

When other PLCs need to meet they too must either try to book time in room 200 or seek an alternate location which will provide enough space and privacy the group to meet. As a result, PLC work and other opportunities for common planning time is often dictated by room availability.

The vision for the new school is to increase both time/opportunities and space for teacher collaboration. This can be accomplished by incorporating collaborative spaces into each academic area in each department as well as including shared collaborative space to allow for cross-disciplinary collaboration. Teacher workspace, equipped with worktables, access to technology and phones, and storage for planning / curriculum materials is essential to enable each teacher the opportunity to work both individually and collaboratively to design lessons to deliver the curriculum. These workspaces need to be flexible in design so as to accommodate changing teacher needs and to be able to be used for both individual and small- group professional learning opportunities.

These teacher planning spaces need to be located in close proximity to the various academic neighborhoods to foster collaboration by subject, team as well as allow for interdisciplinary sharing. Each department space needs to have a table and rolling chairs to allow for flexible seating to accommodate a variety of professional learning and collaborative activities. Individual teacher workstations with flexible furniture, including individual locking file cabinets and flexible seating will ensure every teacher has a home base from which to work and allow teachers to spend valuable time during their preparation period on planning effective instruction rather than trying to find space to work.

Professional development/ professional learning opportunities occur in a variety of ways at Doherty. Whole- group, small-group, and one-on-one coaching sessions and individual activities are used throughout the year to support the needs of our teachers, and ultimately to support the needs of our students.

Each year the principal, Instructional Coach, and the Instructional Leadership Team (ILT) review the data to identify areas of student need. With that in mind, this group identifies which topics/ to be addressed for all staff members, which areas are content-specific and will be addressed professional learning session by department, which areas will be addressed in targeted small-group professional learning sessions and which areas will be addressed in one-to- one professional learning/coaching sessions with the Instructional Coach.

Professional learning opportunities take place using several formats. Each year the staff participate in two full day professional development days. During these days there is a mix of whole-group professional learning, small-group professional learning, academic department professional learning, and individual teacher reflection. Additionally, each month there is professional learning sessions help as part of the principal's meeting and during department meetings. Whole-group professional learning is held in the school's cafeteria and small break-out sessions take place in classrooms.

Professional learning takes many forms including, but not limited to presentations, (video, and/or speakers) book studies, modeling successful strategies, ongoing analysis of multiple sources of data, whole and small- group discussion and reflection, as well as a variety of training sessions such as MCAS / SAT test administration procedures, ALICE training, technology and other safety/wellness trainings. During professional development days, department meeting days and other after- school sessions, small groups meet in available spaces such as classrooms, the library and the conference room (room 200). One-to-one coaching/professional learning sessions occur in the Instructional Coach's office or in individual teacher's classrooms. Technology coaching is offered by the school's two Google trainers and occurs where there is available space and access to technology.

While there are multiple opportunities for professional learning to occur throughout the year, the principal, Instructional Coach, and the ILT work to create a theme and establish connections between topics to link ideas and to create a web of professional learning that is applicable and supportive to all staff members.

The vision for professional development in the new building, as we move toward the academy and neighborhood model, will include expanding opportunities for teachers to meet in PLCs and increasing collaboration in PLCs in grade-alike groups/teams, vertical collaborative groups and

cross-disciplinary groups. These collaborative and professional learning sessions will take place in the collaborative spaces located in the different "neighborhoods" associated with the academic disciplines (STEM/STEAM, humanities, arts, world languages, special education, etc.). With the addition of the Grade 9 academy, there will be increased opportunities to schedule common planning time for teachers who work with the same group of students. Additionally, with the creation of academic neighborhoods for core content classes for grades 10-12 there will be opportunities for grade-alike collaborative meetings by content area as well as by academic pairings (ELA and social studies, and math and science). The addition of collaborative spaces will provide places for these teachers to meet, something that is currently unavailable in the current building.

Within these spaces there needs to be appropriate technology to support professional learning and presentations and modeling of successful strategies. This would include being equipped with access to technology, printing, presentation equipment (projector, screen, sound, flat screen TV for video). Additionally, there needs to be shared collaborative space between the different neighborhoods complete with appropriate technology and presentation equipment (projector, screen, sound, flat screen TV for video) to provide both content- specific technology trainings and cross-curricular professional learning opportunities. Such shared professional learning/collaboration space could occur near the humanities departments, STEM departments, arts departments, health and wellness departments and counseling/administrative departments.

Professional learning is a continuous process and needs to be able to be delivered and allow for active participation in the various venues. Whole-group professional development opportunities require a large area with appropriate access to technology and presentation equipment (projector, screen, sound, flat screen TV for video). Both the cafeteria and the auditorium need to be designed to allow for professional learning presentations --access to technology, sound, presentation equipment (projector, document cameras, screen, TV

Professional learning also involved individual support and one-on-one and small group coaching. Doherty currently has one instructional coach. The vision for the new building is to provide a space for two Instructional Coaches (one for the humanities and one for STEM) where each coach can meet with small groups and in private with individual teachers. There needs to be a shared collaborative space for planning and presenting professional development complete with access to technology and presentation equipment (projector, screen, sound, flat screen TV for video) and access to whiteboards to model successful instructional strategies. There also needs to be adequate storage space for professional learning resources and materials for both the Instructional Coaches and staff members.

Assessment Coordinator

Students in Grades 9-12 engage in a variety of assessments to measure student progress. Assessments include Star assessment, PSAT/ SAT, AP assessment, ACCESS test for EL students and Massachusetts Comprehensive Assessment System (MCAS) assessment, which is a graduation requirement. The Assessment Coordinator, referred to as the MCAS Specialist currently works out of an isolated office on the first floor to keep secure test materials.

The vision for the new building is to provide a space for the Assessment Coordinator/MCAS Specialist to prepare test materials, review data and monitor/administer assessments that occur throughout the building. The area needs to have access to technology (desktop computer) that allows the coordinator to oversee online testing that occurs in classrooms. While many of our assessments are nor given electronically, there are still some hard copy test materials (student test tickets, paper test for students for which this is an accommodation in their IEP) that need to be secured. There needs to be space within this office to organize test materials and to meet with teachers and students to review data and test results.

Room Assignments

Currently, the assigning of rooms is difficult due to our overcrowded and outdated facility. Over 50% of the teachers in our school travel from room to room and although we attempt to limit the distance it is difficult to keep the traveling teachers within the department to which they are assigned. As mentioned throughout this document, some courses are being taught in rooms for which they were not designed, and others are simply too small for the number of students in our classes. The vision for the new school is to maintain the assignment of rooms by department with intentional adjacencies to support teaching and learning. Rooms dedicated to the ninth- grade teams, Special education and Chapter 74 programming will not follow the departmental or "neighborhood" room assignment methodology but rather will be integrated into "neighborhoods."

F. Lunch Programs

Doherty Memorial High School's current cafeteria includes approximately 4312 square feet, excluding the kitchen, food preparation, storage, and point-of-sale stations. There are 36 tables for student seating. During each seating, students enter through one of several identical serving lines. Each line operates similar to a cafeteria-style, where an employee serves the food onto disposable trays and places these trays on a stainless-steel serving station. Students move across the serving line and select their items, ending at the point-of-sale station operated by another cafeteria employee.

Per district policy, all students in the Worcester Public Schools are offered free breakfast and lunch each day. After making their meal selections, students enter their unique Worcester

Identification number at the point-of-sale station. If a student selects additional items during a meal, they are able to pay cash for these items.

The current Doherty Memorial High School cafeteria is situated at the end of the first-floor corridor. Students are able to enter and exit through a primary entrance, with a secondary entrance at the back of the cafeteria. At the start and end of each lunch period, there is a delay in dismissing students promptly as the limited number of exits, as well as the layout of the corridors and stairwells, hinders the timely flow out into the rest of the building.

The cafeteria space provides seating for students with bench-style, foldable, rectangular tables. The maximum capacity of these tables is approximately 432 students. With a student population well over 1500 students, and with 3 lunch seatings, the cafeteria is currently over capacity during each lunch period. Some students are able to each lunch in other supervised settings, including classrooms, the guidance area, administrative offices, and in the library, when available.

The hope with the new school construction design is to ensure adequate space for a third of the school population. The district-wide secondary-level bell schedule designates three lunch seating sessions, approximately starting at 10:45 a.m. with the last seating ending shortly after noon. The planned student population is 1670~~, however there will likely be far more students than what is anticipated. As introduced and clarified within the vocational and proposed programming sections, this design proposal is planning for a cafeteria to house up to 675 students at each seating.~~., so the cafeteria will be designed to support 557 students per lunch period.

Prior to the start of the school day, students are able to acquire breakfast from the cafeteria. Many students choose to select their meals and sit in the cafeteria space, while others elect to take their selections and head to their classrooms, lockers, or to meet up with staff and/or students. Cafeteria planning and delivery models are changing to reflect a ‘grab and go’ service style. Once the school day starts, students coming in late still need the opportunity to get breakfast. Therefore, there will be one ‘grab and go’ serving station available in the serving area that will remain open once the school day begins. This station will be structured to serve as a stand-alone, albeit smaller, entity that serves students at non-traditional times. For example, this stand-alone, self-sufficient station would serve students coming late to school, arriving after the starting bell and after the main cafeteria and kitchen closes as they begin preparations for the lunch service. In addition, this station would now provide opportunities for students, e.g. those participating in afterschool athletics or extracurricular events, to access nutrition in the later afternoon or evening. This stand-alone, self-sufficient station’s design will include a point-of-sale unit, handwashing infrastructure, a refrigeration unit, dry storage, a countertop heating cabinet, and will be kept secure via a rolling overhead door. This station will be accessible to students without needing to enter the main kitchen or main serving area.

The new cafeteria design will consist of one central kitchen and serving area adjacent to the student seating area. The design will enable proper visibility throughout both the serving and seating areas for supervisory purposes, and will have windows providing daylight throughout the space. During passing time, there will be multiple points of entry and exit, thus ensuring a steady student flow. The student seating areas will consist of several smaller, though connected, dining areas revolving around this central kitchen and serving area. The new school design has planned for 8350 net square feet for the cafeteria seating area. This space, while dedicated for breakfast and lunch time use, will be available as a multi-purpose space during non-meal time hours.

The student seating area will connect to an exterior dining area. This space will allow for overflow during the school day and would allow students to be outside during appropriate weather, but will also enable after-school activities, e.g. athletics, to access the kitchen space.

In order to provide the same access for staff to meals, a faculty cafeteria will be situated adjacent to this space. This space would occupy 200 net square feet and would contain a buffet-style adult service station, and would be structured with a single, linear serving line ending with a point-of-sale unit. One additional benefit of this space is that it would allow for other adults, e.g. school visitors, to have access to meals if needed, though the design is not intended for steady community usage. The faculty dining room will essentially provide the full range of cafeteria services and options through a reduced footprint. This station can be operated by staff members, and can provide meal options to students beyond the school day.

To facilitate ease of serving and to provide access to food during a teachers' preparation period as well as to students who participate in after-school activities such as sports or drama rehearsals, etc. We are planning to include a robotic salad machine "Sally" by Chowbotocs. This robotic vending machine customizable, made-to-order salads, snacks, breakfast bowls, and grain bowls within a sleek 3×3 footprint, requiring minimal space in the cafeteria. No additional space is needed if the machine was not available. This machine, located in the faculty dining area will provide continued access to healthy snacks beyond the school day. The ingredients will be prepared by current cafeteria staff and menu items can be updated seasonally and could incorporate items that are grown in the school's garden/growing spaces.

The proposed main cafeteria serving area will be based on a scramble-style service. This is a variation where numerous stations are arranged around the space, each serving different foods. The variation in menu selections, along with the expected student population being served on a daily basis, demonstrates a need for 5 serving stations within the serving area. Students would go from one station to another, and after making all selections they would then exit through one of several point-of-sale stations. One benefit of this scramble-style service is that students can move from one serving station to another without having to pass through an entire line offering choices of which the student will not select. Research indicated that a scramble style kitchen enables

more students to be served in shorter periods of time. Within similar research, however, scramble style serving areas require more space than single line serving stations (Beasley, 1995).

The desired ratio is 75 students per point-of-sale station. The proposed design is planning for 6 stations. This figure represents a balance between the available staffing with the logistics of ensuring students are able to efficiently move through the serving stations and have sufficient time to eat. Typically, 80-90% of the school population cycles through the cafeteria serving lines.

In order to accommodate such a high volume of students during each seating, the scramble style serving area is planned for 3000 net square feet. This will be supported by a kitchen and preparation area adjacent to this serving area. The planned kitchen area would provide 3,146 net square feet and would include a Dry Prep area which is utilized for bundling nonperishable meals. The space can be used to prepare breakfast and lunch meals for Doherty as well as for distribution at other schools within the district that lack facilities and space. For example, the kitchen at another city high school, with allocated conditioned/refrigerated space is preparing salad and fruit servings that are then shipped to other schools across the city.

The kitchen space would include 'pass through' style doors, have central tables and food preparation, dry storage shelving around the perimeter, ovens and warmers, a dishwasher, and appropriate hand-, food-, and tool-wash sinks. The kitchen will also require a walk-in freezer and walk-in refrigerator. Each would be approximately 200 square feet, with 8-foot tall ceilings.

The refrigeration units and the dry preparation spaces should be in proximity to the loading dock or delivery area. This would allow for prepared food deliveries to be moved to and from the loading dock without having to travel through the main kitchen. Within the kitchen space, an employee office space will accommodate up to 6 workstations. These employees will utilize an adjacent locker room/changing area, including a lavatory and shower facility. A custodial closet, providing storage for cleaning supplies and related materials, will be accessible from all associated areas.

G. Technology Instruction Policies and Program Requirements

During the 2018-2019 school year, the Worcester Public Schools converted the majority of hardware and software to utilize the Google suite of products. Most staff members, including all teachers, were issued a Chromebook for their individual utilization. In addition, based on the school population, each school was allocated a number of Chromebooks and storage/charging carts for classroom utilization. Staff members are permitted to bring their Chromebooks home for lesson planning and preparation. With these devices, faculty members can access the Google G Suite of office applications, including Docs, Sheets, Slides, Drive, Calendar, and others. These

applications provide similar features to the Microsoft Office products, i.e. Word, Excel, PowerPoint, etc.

In addition, the school has purchased numerous carts outfitted with a document camera and a projector. These are assigned throughout the building and are shared between all staff. These devices connect to desktop and Chromebook computers and are used by educators and students for instructional purposes. Some classrooms have a ceiling mounted projector, installed by Doherty staff.

Prior to this transition, Doherty relied primarily on desktop computers and traditional computer labs located throughout the building. Each classroom had a desktop for staff use, there were several generalized computer labs, including one in the library, others for general classroom use, and some computer labs were designed to support specialized curricula. Chromebooks, and the associated G Suite software, now provide typical general education classrooms with the ability to conduct research, perform word processing tasks, and design and implement presentations.

However, Doherty offers several courses of study and educational programs that require hardware and software that stretches the limits of the Chromebooks. Prior to the transition, therefore, each school was able to request and plan for their unique number of needed computer labs-labs equipped with more robust desktop computers that can operate specialized curriculum, including the computer programming, marketing software, and the varied engineering tools, e.g. AutoDesk, required in those courses. Each computer lab designed and/or retained in the school lowered the allotment of student Chromebooks that would ultimately be delivered.

The student Chromebooks are stored in moveable charging carts. These carts are stored throughout the building and are spread across each floor. The school administration created a digital calendar allowing staff members to reserve the carts for specific days and instructional periods. Each day, staff members will move these carts from one location to another based on this reservation system. With 73 classrooms and 24 carts, each cart is used daily.

Each Chromebook cart is assigned to a specific classroom for evening storage and charging purposes. This ‘home-base’ policy ensures that all carts are accounted for at the end of every day and that they are properly charged for use for the coming day. During a typical day, the period 1 educator who has reserved the cart will go to the home-base classroom and bring the cart to his/her classroom. The educator has a standardized sign-out log, where each student is assigned a specific Chromebook for usage. This is done to minimize the loss of instructional time in getting the Chromebooks to each student.

Part of the Worcester Public Schools’, and Doherty’s vision of a graduate and guiding principles is to graduate computer-literate students. Students coming to Doherty have unique and diverse

background knowledge relating to their skill sets and technological proficiency. All staff, throughout the school year, plan lessons and learning activities where students will utilize the available Chromebook technology to engage with their respective curricula. Students conduct research, discuss and respond in writing to a variety of prompts, prepare and deliver presentations, etc. Effective with the 2018-2019 school year, Doherty is administering several standardized exams, including the MCAS exams, AP Spanish Language and Culture, and an internal diagnostic literacy and mathematical proficiency test, via the Chromebooks. To ensure that student exam scores reflect their respective level of curricular comprehension, as opposed to their computer-interface proficiency, staff plan lessons that enable students to learn the mechanics of using the devices prior to the exam administration.

Near the end of the lesson, the educator ensures students have saved their work, logged out, and returned the Chromebooks to the cart in preparation for the next period. This process takes several minutes of instructional time. At times, the cart will remain in the classroom for the incoming students, but often the cart will be moved to another classroom. Given the crowding in the extremely narrow hallways during transition times, educators often try to move the carts in the moments right before the dismissal bell, or in the moments right after the bell to start the next period.

The process then repeats with having students getting their assigned Chromebooks. In general, each cart is used throughout the day, and often each cart is moved from one classroom to another, and ultimately is returned to the home-base for evening storage. There are numerous carts on each floor of the building, approximately proportional to the number of classrooms therein.

With the transition to MCAS 2.0, the Chromebooks are used for standardized testing. Given the approximate size of the testing population, the majority of Chromebooks (21/24 carts during the spring 2019 MCAS administration) are reserved. Carts are reassigned to specific testing rooms for the exam administration days, and several are brought from other floors. Given that there is no elevator, carts are brought outside and wheeled through the parking lot to a doorway accessing the testing floor. This is done the day prior to the start of testing. This necessity reduces the availability of this technology for general classroom usage during exam administration.

The Worcester Public Schools, through their Office of Instructional Technology and Digital Learning, regularly offers Chromebook and G Suite training to all WPS staff. Recent trainings target novice, intermediate, and more experienced users, and include numerous offerings throughout the summer and school year: Beginning Google Challenges for Educators; Rethinking Lesson Planning with Digital Tools; and G Suite Accelerated Trainings are all recent offerings. Doherty has identified and trained, through this district office, several staff members to

be ‘Google Trainers,’ or site-based personnel with more advanced knowledge so that he/she can provide more timely and personable support to the building personnel as each continues to improve their facility with the relatively new technology. Doherty, through its internal professional development opportunities and facilitated by the in-house Google Trainers, provides support for any interested staff members. This support happens through formal planned sessions, e.g. during a faculty meeting, but it also is provided informally through one-on-one conversations and requests for assistance from a staff member to the Google Trainer.

The Worcester Public Schools Information Technology (IT) Department services and maintains this technology. Staff devices, if damaged during normal usage or through expected wear and tear, are replaced with an equivalent unit. If a student Chromebook is damaged, it is sent to an administrator who submits a repair ticket to IT. A member of IT will collect the device and return it after repairs are implemented, usually within one to two weeks depending on the nature of the damage.

The Worcester Public Schools’ Strategic Plan outlines the district-wide goals and objectives relating to technology and the students’ development of technological skills. In part, the Worcester Public Schools ensures that “all students will have access to rigorous and personalized learning supported by technology.” Technology certainly includes computers, Chromebooks, printers, projectors and other standard classroom devices, but also extends to curriculum specific tools. For example, the Doherty Science department utilizes TI Nspire devices within their laboratory activities, the Mathematic department provides opportunities for students to utilize the range of programs available with the more advanced TI Graphing Calculator series, and the World Language department utilizes programs that enable students to speak and record as they learn another language.

The Worcester Public School’s Strategic Plan, through the Office of Digital Learning, has outlined a plan to provide 1:1 classroom coverage for all school for the start of the 2024-2025 school year. These Chromebook devices will be leased. As such, each classroom will require appropriate charging stations (standard 110-120V outlets).

The acquisition and utilization of educational technology is coordinated by the district’s Information Technology Department. The responsibilities of this department include the maintenance and infrastructure support for every school and program in 55 locations. Further, the department supports:

- Over 1,500 computers, 14000 Chromebooks, and over 3,000 iPads;
- 75 servers, including file, domain, and backup servers;
- A district website with a content management system that allows schools, teachers, and administrators to modify their personal website;
- Cloud hosted email services for WPS employees and students;

- Internally developed and maintained student and employee information systems;
- Data analyst services providing data for research and evaluation purposes.

The district utilizes CIPA compliant web filtering, email archiving, backup data protection, fiber wide-area connectivity to all sites, and a 10 Gbps internet connection.

The IT Department, as part of the district's Strategic Plan for Education, has set goals and benchmarks to positively affect all schools, including Doherty. These goals include:

- The acquisition, implementation, and support of an updated student information system. Currently the district utilizes an internally developed system maintained by district employed programmers. The adoption and implementation of a commercial, industry-standard student information platform would provide additional features and benefits for families, students, staff and administrators at all levels.
- The improvement in wireless access in school buildings. The goal is to develop and maintain a robust wireless infrastructure to support a 1:1 device initiative throughout the district. The current Doherty facility offers three levels of wireless access, though coverage is constrained by the physical layout. In any new design, the campus will be equipped to offer industry-standard, up-to-date coverage throughout the entire campus.
- Address the digital divide outside of school. The goal is to improve after-school access to technology and the internet to support student learning.

The goal for the new facility is to ensure full wireless capacity. This will be accomplished with two network drops in each classroom space, two for the teacher's main station, and ceiling mounted network access points. During the feasibility and visioning sessions, several community members raised concerns relating to the health effects of Wi-Fi. During a December 2016 School Committee meeting, the Standing Committee on Teaching, Learning and Student Supports made a report to the full group, part of which included a motion to develop a set of best practices relating to mobile devices. The presentation also stated that the City of Worcester, in policy practices and design decisions, follows the recommendations of the FCC, the governing body on Wi-Fi exposure.

As the Doherty community worked to develop this Feasibility Study, the goal is to increase the number of vocational offerings available for students. One identified vocation - Programming and Web Development - was chosen due to the demonstrable interest among students, as well as the expanding labor market in the local, state, and national regions.

As the school personnel, curriculum advisors, and the advisory council develop the Programming and Web Development program, the goal is to create a partnership with the district Information

Technology office, establishing an in-school functional training center. This Information Technology office space would house the school-to-district networking infrastructure, include office and computer workspace for the district's Information Technology Support Specialists, the personnel who maintain the school's software and hardware needs. These Support Specialists would also serve as partners with the vocational program educators to provide practical experience, tutoring and training, and mentoring to the vocational program students. The Information Technology office would, in essence, function as a workspace for the school's Support Specialists while doubling as an industry-standard worksite for students to apply their curriculum knowledge and skills from their coursework. This partnership will be a critical component within the proposed vocational programming.

To welcome students, parents, community members, visitors, and others to the school, an interactive display is desired in the lobby near the main entrance. This display will provide branding and integrate the history of the school, but also provide valuable information, such as office locations, to visitors. The suggestion for an interactive welcoming display originated during the visioning process and then fortunately, we were able to observe an interactive display during one of our school visits to a newly constructed high school, Billerica Memorial. We envision this tool as a means to integrate technology, an identified priority, and we view this as an invaluable way to share information with visitors and members of our school community alike in an interesting and engaging manner. The entire branding package will support our desire to capture our sense of belonging, to foster school spirit, and to capture valuable connections between our school's past, present, and future. We plan to have our students involved with the development of our branding package design. To strengthen partnerships and relationships throughout the school, students from the Programming and Web Development program will liaise with organizations, athletics, clubs, academic and support departments, etc., and create and maintain the displays available for viewing in the lobby.

The Technical Services/Information Technology space in total will encompass ~~5000~~ 4500 square feet, will house the school's critical servers, networking, and related hardware, and will be comprised of the following:

- One secure access room to accommodate the Main Distribution Frame (MDF). At 150 square feet, this MDF includes the interface between the telecommunication utility's and the school's access connection (demarc to fiber connection), the primary routing switch for the building, as well as the network hardware enabling network access for the building. The server and related infrastructure are to enable Doherty to access critical technological services. This technology requires 200 Volt service and must be climate controlled.
- A technical equipment receiving and storage room. At 500 square feet, this space would ideally connect the IT office space to the exterior of the building, allowing for deliveries and access to district personnel as needed. This space would double

as the storage and maintenance location for the school's generalized audio/visual needs (e.g. projectors, document cameras, video players, microphone and speaker equipment, etc.).

- A multi-use space.
    - At 2000 square feet, this space would be subdivided to house 8 individual work-stations for the Support Specialists. The Support Specialist work-stations will service both Doherty and district-wide technology needs. Each school is assigned a Support Specialist, and so Doherty's Support Specialist would be allocated a workstation in this space in which to work. ~~and~~ This space will enable multiple students to engage individually with professionals at the same time. Each work-station would include an individual home-run or link into the Main Distribution Frame, a computer station, and a workbench/desk. The station would require network access and be serviced with multiple 110 Volt outlets.
    - The remainder of the multi-use Information Technology space would be an open-concept conference set-up, so that a group of students can work together, but also enable Support Specialists and IT Staff from across the district to have a collaborative workspace. The conference set-up and additional work-stations support district-wide needs.
    - With the inclusion of the Programming and Web Development Vocational Program, Doherty plans to utilize this combined IT space collaboratively with the Support Specialists: The Support Specialists will have a role within our vocational programming. Students will be able to work with Support Specialists to engage with their curriculum through real-world applications. Upper-class students will have opportunities to complete their co-op or internships in-house alongside the working members of the IT department.
    - The space would include Audio/Visual technologies for presentations, collaboration, etc.

All IT spaces will be accessed via ID cards, providing permissions for authorized personnel. The MDF/IDF and network will be supported by generator-provided back-up power if needed.

The Information Technology office, storage room, and MDF should be adjacent to the vocational Programming and Web Development classrooms due to the close integration of the functional workspace with the academic instruction and opportunities for practical experience.

The Information Technology Support Specialists maintain the school's network infrastructure, but also service school equipment including desktop and Chromebook computers, projectors, switches and servers, etc. The Support Specialists, working in-house, would, in part, help ensure

reliable access to network services throughout the day. Reliable access, and available personnel to troubleshoot issues, is vital as more and more classroom learning activities and standardized assessments are computerized. The design would therefore include a lavatory space-sink and toilet-adjacent to or within the Information Technology office space so that both students and school personnel can maintain hygienic conditions when working with this sensitive and costly equipment.

In addition, several spaces within the design will include Cable TV capacity. These include the main office, MDF/IDF rooms in the IT space, library, and the cafeteria. Access will not be wired to each classroom. There will be converters for broadcasting from the gym or auditorium through the network, as needed.

Media Center/Library

The Media Center/Library is located on the second floor of the existing school structure. The Media Center/Library houses a set of approximately 6,000 books, including fiction and non-fiction texts. These books are primarily used for student use, both recreationally and for classroom learning activities and assigned reading tasks. The Media Center also contains a variety of DVD and VHS videos supporting a range of curricular topics. These videos are available for teacher use. The Media Center offers an assortment of magazines as well, supported via donations from a variety of sources. Years ago, the Media Center also included a computer lab, available with reservations for classroom use.

There are currently two Chromebook carts, providing a total of 60 devices, available for student and/or educator use. There are three desktop computers which offer print capabilities to students working in the space. Currently, student Chromebooks do not offer direct-to-printer access. A projector and a portable white board are also available.

During the school day, students are able to get passes to come to the library. Typically, this occurs when a teacher is absent, and the student is able to sign in. Students often then use the available devices for research and for classroom assignments, or are able to work individually or in groups at one of the available tables in the space. There is no private collaborative workspace however: student groups may be working and discussing project tasks next to students working privately on their own.

The Media Center is staffed by a full time, certified librarian, and is further supported by several staff members for which their duty is to assist and monitor students utilizing the space.

The Media Center opens approximately 30 minutes before the start of the school day. A staff member is assigned to supervise the space, and students are able to sign out Chromebooks, use

the desktop computers to print as needed, to check out texts, and are able to get a pass for an instructional period later in the day, when available. Similarly, the Media Center is open for 40 minutes after school, again for students to have a space to complete homework, work on classwork activities, or collaborate with others. Another staff member is assigned to the space after school to provide supervision.

During the school day, the Media Center can be reserved by staff for classroom use. Most often, educators reserve the space and bring their classes to the Media Center in order to utilize the available Chromebooks. At times, educators will use the space to conduct student presentations. Administration occasionally reserves the space for district-level meetings, though due to the layout, available technology and limited on-site parking most administrative meetings are scheduled for another location with more readily available amenities. At times throughout the year, the Media Center is reserved in order to administer various standardized exams, including MCAS, AP Exams, ACCESS testing, etc.

Doherty Memorial High School is currently working on a repurposing of the existing Media Center space. With the removal of desktop-based computer labs across the school and the acquisition of mobile Chromebook carts, the frequency of staff bringing their classrooms to the space has decreased.

The school community envisions an up-to-date, flexible space that allows for student, staff, administrative, and community use. Increasingly, students are engaging in collaborative learning tasks requiring research, synthesis of skills and content knowledge, and the development of a presentation or a product to share with others. A flexible workspace providing appropriate technology, a level of privacy so as to not hinder the work of others, and with the convenience of access throughout the day will enable students to engage in rigorous, multi-disciplinary performance tasks. Similarly, a modernized space with audio/visual and presentation capabilities will allow for effective staff use, such as for collaborative conferences, administrative meetings, etc. In addition, Doherty will be able to make the Media Center available for student community use, including during non-school hours.

Moving forward, the Media Center still needs to serve as a repository for text materials. However, there is greater potential for the space. The design and implementation of a ‘learning commons’ space would enable all school and community members to have the flexibility to utilize the space based on the needs of their performance task. Additionally, the vision for the new facility includes a career center, a cafe, and multiple printing stations per each grade to be located in the media center area.

Makerspace

At the start of the 2019-20 school year all members of the Worcester Public Schools participated in the district's fourth annual Opening of School Convening and Recognition of Excellence ceremony. Keynote speaker Jaime Casap challenged the audience to think about technology and reminded us not to "ask kids what they want to be when they grow up but what problems do they want to solve. This changes the conversation from what I want to work for to what do I need to learn to do that." This challenges us to provide opportunities for students to explore and to create as part of the learning process.

As summarized in the 2018 Stem Learning Design Report, 'Review and Recommendations of Best Practices for K-12 Learning Spaces,' schools and districts are shifting educational decisions and methodologies to align with the 'innovation economy model.' Doherty Memorial High School readily agrees that students need learning opportunities that emphasize process skills, decision making, contextual and community-based problem-solving experiences, etc. The vocational engineering program offers a subset of the students' ample opportunities to acquire content knowledge as well as practical, competencies and skills. The desire and goal are to increase the range of innovative learning models available to all students, regardless of their choice from the various educational programming options being proposed, and this is in agreement with the STEM Learning Spaces report:

> Schools have begun looking for opportunities across the curriculum to integrate more of a process focus, including engineering design and prototyping, to prepare students. Learning spaces to support this model focus on collaboration and sharing tools, inclusion of a wide variety of materials and small-scale mechanical and digital tools to quickly prototype and test solutions, and flexibility for regularly changing projects or contexts. (p. 12)

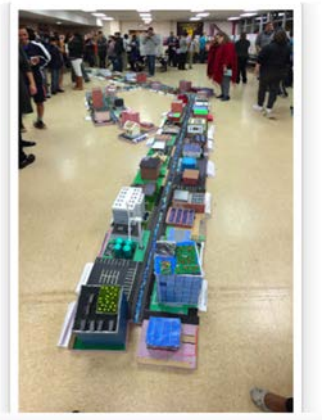
As students' progress through the K-12 system, en route to college and/or careers, there is a clear demand to ensure that students have mastered a suite of readiness skills across a range of content areas. Currently, students have opportunities to engage in rigorous learning experiences that reflect interdisciplinary and integrated learning. Notably, within the Engineering Technology Academy, the school's vocational Engineering Technology program, students complete several 'learning fair' projects. These projects are designed by an interdisciplinary team of educators representing Engineering, Science, Mathematics, English, and Social Studies. Over the course of weeks, students complete a variety of tasks within and across their courses, ultimately integrating all components and presenting their work in a family and community forum.

Figure 3 Figure 4

A student's display containing elements from each of his five core academic classes: Engineering, Science, Mathematics, English, and Social Studies. All projects are then on display for students as they share and discuss their work with family and community members attending the learning fair showcase.

Figure 5

Figure 6



Each ETA student designed a parcel of land based on various zoning criteria. Combined, the students recreated the path of the Blackstone Canal, originally running through sections of Worcester. Students reimagined the Canal district, incorporating environmentally friendly designs and that accommodate the needs of a diverse community.

Outside of the teamed ETA, integrated learning is relatively new for many students and staff. This is mainly due to a lack of space for common planning and for interdisciplinary planning, existing space and technology limitations, and the lack of much needed adjacencies between and among various departments. Often, teachers within their individual classes will design learning activities that incorporate multiple domains of learning and that span content areas, but there are

challenges to implementing true cross-disciplinary work that brings multiple classes and content educators together.

The vision for the new Doherty Memorial High School is to incorporate design features to enable students and staff opportunities to engage in interdisciplinary learning. For example, the feasibility design is planning for ninth grade academies or teams, where educators would share similar groups of students within a close set of rooms, allowing for greater flexibility regarding the schedule, mixing student groups, and accessing and sharing the strengths of staff and students alike. There will be improved common planning space and adjacencies between and among departments to foster collaboration, interdisciplinary connections, project-based learning and real-world applications, which were priorities that were identified through the visioning process.

To support this collaborative effort, and enable all staff the opportunity to work together, e.g. in STEAM based learning experiences, the new Doherty Memorial High School will include a Makerspace that will be accessible to all. The goal is to integrate the available classroom technology, including Chromebooks, with modern and industry-standard equipment that, to date, many students have not experienced or utilized. This equipment includes, for example, 3D printing technologies, hand and simple power tools, manufacturing technologies, presentation technologies, and a range of learning materials based on the varied projects and student activities occurring within the space. As supported in the STEM Learning Design (2018) report, the space will enable flexibility as educators can plan for varied projects, changing equipment utilization, and that enable all educators within their core academic programs to have opportunities to utilize the space with their students.

While Makerspaces are often associated with STEAM education, there are robust opportunities for all staff from all content areas to enable their students to work collaboratively. Due to the collaborative nature that promotes group work, the MakerSpace will ideally be adjacent to the Media Center, which is a site that allows additional flexibility relating to group or project work, as well as for student presentations and showcases of their work. The space will be staffed by the school's Media Specialist, and this staff member will be responsible for maintaining the schedule and coordinating logistics, as needed. The Media Center's collections, technologies, and physical layout are designed to enable students to access resources and materials, along with instructional support from the educator and the Media Specialist/Librarian, as they engage in increasingly personalized learning activities. The adjacent MakerSpace supports student work as they hone their skills in preparing for entry into a 21stcentury workforce.

As the Media Center will be available for community usage, student work-both in progress and finished products-will be displayed, showcasing the students' abilities and talents as they engage in rigorous curricular learning activities.

H. Visual Art

The Visual Arts Program in the Worcester Public Schools offers students an in depth exploration of the standards identified in the Massachusetts Arts Curriculum Frameworks (1999) and is informed by the National Core Arts Standards (2014). Support for classroom and after school activities are enhanced through partnerships with local and national cultural organizations.
At Doherty, in the Visual Arts department currently, there are three rooms dedicated to the teaching and learning of visual art. Consistently over time, we have received many more requests from students to participate in course offerings in Art than we have been able to accommodate. One credit in the Arts is required for graduation for all students in the Worcester Public Schools and we need to have appropriate space to offer additional courses to support student interest and fulfill this requirement. Beginning this year 2019-20, we are offering an Early College Course in Drawing on our campus as part of our partnership with Quinsigamond Community College.

Despite the recent staff increase from one Art teacher to three, the need for additional and more appropriate space continues for the study of visual art. Of the three classrooms dedicated to visual arts, only one of the rooms was actually designed for this purpose and is in need of updating. There is a need for increased number of working sinks, additional and flexible space for students in the art classes to work, and an improved centralized area to display their talents to the school community and the community at large. Despite the challenges of our current facility, our art students have won several different awards and have been recognized for their talent each year. Currently we have student work displayed in some areas of the school and we value the ability to showcase the incredible talent of our students, but much more space is needed to do so.

The vision for the new school includes increased staffing due to increased enrollment and additional and more appropriate space. In order to support teaching and learning in the visual arts we need classrooms with flexible furniture and adequate workspace, functional sinks and increased storage space. The art rooms should be located adjacent to one another in order to support collaboration and shared ideas and supplies. A digital art learning lab should be included to support several desired additional courses and to support the digital portfolio development needed for Advanced Placement Studio Drawing and for many college applications. These spaces would facilitate the implementation of our art education program and allow us to offer additional coursework such as AP 3D Art and Design, printmaking, graphic art, digital media art, digital photography, ceramics, sculpture, and digital illustration. As we move toward implementing the recently developed Arts Frameworks, which are currently posted for public review and expected to be fully adopted in the very near future, it will be important to have appropriate space and technology. There is a need for additional collaborative space, called Common Rooms, to support the design and implementation of a cohesive art program.

Additionally, we would be able to incorporate the visual arts will our STEAM subjects and to support our proposed Chapter 74 programming that involves STEM. One credit in the Arts is required for graduation for all students in the Worcester Public Schools.

This flexible space, designated on the space summary as "Common Rooms," will provide for multiple orientations and uses, with flexible furnishings to account for current and future needs. These are multipurpose spaces for the benefit of all departments. These common ~~areas~~ rooms will provide ~~within~~ sightline access to ~~of~~ classrooms, are designed to facilitate break-out sessions and will support such opportunities, and will allow for shared presentations and collaboration among classes. Additionally, there needs to be spaces will provide areas for the Visual Arts Professional Learning Communities (PLCs) to meet to collaborate and to support professional learning, complete with areas for presentation and modeling classroom. The arts program would benefit from additional storage pace in this shared collaborative space with individual work areas for each art teacher and dedicated storage space for their course-specific media.

Students would benefit from an outdoor workspace that is within easy access to and within visual sightlines of art classrooms, and an interior community space beyond the classroom with glass enclosed shelving to exhibit 3D work and permanent and movable boards for students to exhibit 2D work. As the design moves forward, the district will ensure that any outdoor space is fully accessible to users with mobility impairments. This space can be used for displays as well as for demonstrations and would benefit from furniture that allows for flexible seating arrangements. Classrooms should be neutral tones and have large windows for natural light with shades to darken classroom, interior multipurpose lighting, exhibit space, bulletin boards, white boards and a large space for students to create autonomously or in groups. Classrooms should have closets, deep sinks, long and wide countertops to work on big projects, large desks for students to allow for flexible seating arrangements, tables to accommodate multimedia and center working, drying racks, classroom cabinets with locks, and long, wide, and deep shelving for project storage. Each room should have easel space, technology space using both the distributive technology model (Chromecarts) as well a computer stations for a digital art lab, several electrical outlets throughout the room, wall area for vertical drawing, interactive screens, bulletin boards and white boards.

Floor plan should include a digital graphic arts room, ceramics and kiln room which will be located in a space accessible to the instructional space that is able to be secured for safety reasons. Visual Arts classrooms need to be located in proximity to the performing arts neighborhood to support collaboration among classes in the arts.

I. Performing Arts

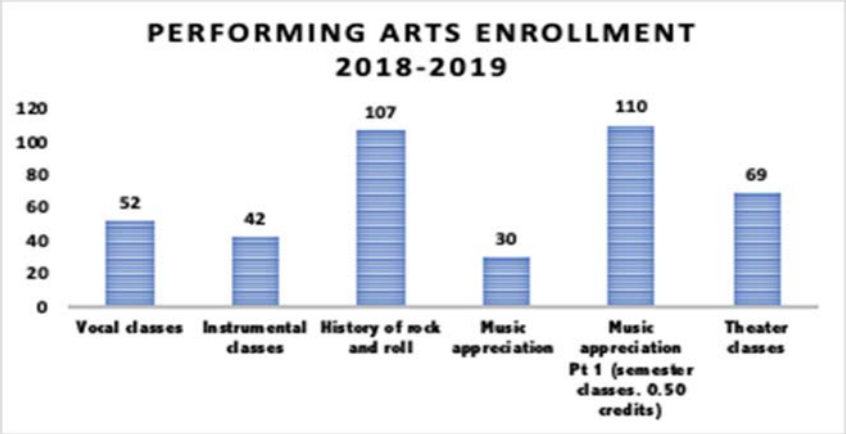
Doherty Memorial High School offers a variety of full year (1 credit) and semester (0.50 credit) music courses and full year (1 credit) courses in theater arts, both of which provide students with the opportunity to explore the history of the subject and /or develop their performance skills.

In 2018-19 the current 1-credit music course offerings included Chorus-Vocal I, Chorus-Vocal II, Chorus-Vocal III and Chorus-Vocal IV, Madrigal Singers I, Madrigal Singers II, Madrigal Singers III, and Madrigal Singers IV, Jazz Ensemble, Band-Orchestra I, Band-Orchestra II, Band-Orchestra III, and Band-Orchestra IV, Music Appreciation, and History of Rock and Roll. The semester-long 0.50 credit courses include Music Appreciation Part 1. The 1-credit theater courses include Theater I-IV.

The Worcester Public Schools' strategic plan notes both student and educator requests to "increase course variety and the opportunity to delve deeply into subject matter and explore current topics" (12). In an effort to support this interest and to provide additional courses in the arts to meet the Massachusetts Department of Elementary and Secondary Education's (DESE) MassCore and Worcester Public Schools (WPS) graduation requirements, additional courses were offered for students. This increase in course offerings was made possible by the addition of a second full-time music teacher.

During the 2018-2019 school year there were 341 students enrolled in music classes, either music history/appreciation or a performance class. Additionally, 69 students participated in theater arts courses. The school offered five sections of Theater Arts: three of these sections were Theater I while the additional two sections were comprised of a mix of students in Theater II-IV.

Figure 7



All of the performing arts classes are scheduled in the two classrooms in the music wing located behind the auditorium/stage. These classrooms were designed for use as music classrooms. The larger classroom (101) was designed for instrumental classes and the smaller room (103) was designed for vocal classes. Currently, the Theater Arts classes are held in these same classrooms.

Performing Arts classes utilize a variety of instruction methodologies including but not limited to whole group and small group instruction and modeling, small group activities, and individual exploration and rehearsal. Teachers work directly with students to instruct them to read music written in standard notation and to learn instrumental and vocal technique. Students are provided opportunities to perform individually and in small groups and large groups within the specific classes, within the school, and within the community at public performances. Students in the vocal classes have the opportunity to sing, alone and with others, a varied repertoire of music. Students in instrumental classes play instruments, alone and with others, to perform a varied repertoire of music. Students in music classes also engage in critical response through whole group instruction and modeling which includes activities such as listening to musical performances and participating in whole class, small group and individual reflections. Students utilize technology in order to access the course curriculum, explore musical pieces and music history and to engage in reflection of these topics utilizing technology. A Chromecart is available on the first floor to support this integration of technology but it is a shared cart and must be moved to the music wing for classroom use.

Within the theater arts classes curriculum is delivered through whole group instruction and modeling in includes activities such as viewing performances, both live and recorded. Students engage in blocking, rehearsing and performing scenes from and productions of entire works in order to demonstrate knowledge of the theater arts curriculum standards. Students work collaboratively in both large and small groups and require space to do so. Additionally, theater arts classes utilize space to demonstrate and to block scenes for class use and to rehearse. Theater classes perform formal dramatic productions for a variety of audiences including their peers within their class and the school as well as public performances both during and after the school day.

The music wing, in addition to the two classrooms, has four small practice rooms, a music office that currently doubles for small group rehearsal space and storage and an additional practice room that was designed and predominantly used for costume storage.

The stage is located directly in front of the orchestra-instrumental room (101) and is used to as part of the instructional space for all performing arts classes. While the stage is an essential part of the auditorium and is often utilized for presentations and small-scale school assemblies, it is also an instructional space which provides opportunities for the students to learn and practice

blocking, home their technical theater skills and musical presentation skills, and allow them to have authentic real-world application of these skills.

The orchestra room (101) is located directly behind the stage and provides the only access backstage to the right wing of the stage. The lighting board is located in the left wing of the stage but its current location limits space in the wings as well as a clear view of the full stage during performances. The catwalk is only accessible by ladder through a side hallway off of the auditorium and as a result is inaccessible by students. The location and condition of these dated items make it difficult to address the curriculum standards, especially in theater arts which requires students not only to learn about the technical theater but also to participate in the technical aspect of the performances.

The vision for the performing arts space in the new school includes additional classroom, rehearsal, and performance space to successfully deliver the performing arts curriculum (music and theater) and grow both the music and theater programs at Doherty Memorial High School. During the numerous school- and community-based visioning sessions, all groups consistently identified as a priority a need for increased programming within this department. We would like to add AP Music Theory to the course offerings in the music department. This course was taught as part of the music department in past years but has not been offered for several years. There also is a desire to expand the theater course offerings. Increased staffing and the availability of additional classroom space in the Performing Arts neighborhood would facilitate the ability to offer these courses. The current layout of the music wing and its classrooms limits the number and type of classes that can be offered at the same time. Room 103 is designed for chorus/vocal classes only. The room is constructed with tiered flooring (mimicking risers) /rows for seating for vocal practice with limited, narrow floor space making it difficult for instruction in other types of classes. This room currently is used for theater classes but the tiered flooring and limited level space at the front of the room makes it difficult to implement the theater arts curriculum. There is limited space for blocking scenes, modeling techniques, and conducting small or large group performances in-class or for other classes in the school. It cannot be used for small-scale public performances either. This classroom is also used for courses such as music appreciation and History of Rock and Roll. The current configuration of the room makes it difficult to arrange the room for discussion or to implement instructional strategies/activities that require students to move around the room (e.g. gallery walk, inside-outside circle. etc.)

The existing design of music wing allows for only one instrumental class to be offered at a time. Room 101 is designed with tiered flooring arranged to allow for orchestral instruction/rehearsal. This is the only room designed for instrumental use/instruction. There are only four small practice rooms in this wing, and they are at the end of the hall, away from the classrooms and lack visibility from the classrooms. There is a need for individual/small group rehearsal/ collaborative space for all students in the music courses. This space needs to be designed to

reduce sound distractions during rehearsals yet still be within the sightline /hearing of the classroom teacher.

There needs to be additional classroom space for theater classes. This space needs to have room to model acting techniques, demonstrate/teach blocking, and engage in individual and group scene work. There is a need for space to allow for small-group collaboration and rehearsal.

All of the performing arts classes require visual access to rehearsal areas and open spaces where small groups can collaborate and rehearse. Additionally, there needs to be easy access to public spaces such as the stage and its adjacent seating (auditorium). These areas are public areas and there needs to be a way to keep the classroom/educational spaces secure and yet easily accessible when needed.

The Massachusetts Arts Curriculum Frameworks indicates that music students need to be engaged in improvisation and composition, demonstrate the ability to rehearse an ensemble of peers, and conduct live performances. As a result, there is a need for a variety of performance venues for class and school use. Providing multiple performance areas for class, school, and community use in the design of the new facility was also a priority that was identified through the visioning process. A 90-100 seat multi-purpose "black box" theater area within the performing arts wing with flexible stage area, flexible and moveable seating, sound, projection screen, and a flexible lighting system would allow an additional performance space for small-scale performances. This area can be used for presentations/demonstrations with music, vocal, and theater classes and the flexibility of this space would allow students to demonstrate knowledge of the curriculum standards, especially the advanced theater standards which require students to demonstrate knowledge of technical theaters and the ability to lead a technical crew, create and implement a major design element (scenics, lighting, sound) for a production, coordinate all aspects of a production by stage managing a theatrical event, and apply technical knowledge of safety procedures and practices in the use of theatre equipment, tools, and raw materials.

This black box flexible space will be used as a more intimate practice and performance space for band and chorus ensembles, as a location to showcase or present projects from all departments, and for "Coffee House" events. As performing arts classes run simultaneously with extracurricular activities such as theatrical productions or housing guest speakers, Doherty will require varied and flexible options based on the class and/or organization's need.

Locating the performing arts neighborhood in close proximity to the auditorium and stage will enhance the learning opportunities for students. The auditorium can be used for in-school and public performances and presentations and should have a capacity of 800 or 900 or half of the school population. The stage itself needs to have adequate space in the wings to accommodate

scene changes and cast and crew access to the stage, curtains and other performance technology. A space needs to be designated for the stage manager to coordinate backstage/production details.

A large overhead door on the back wall of the stage is necessary to provide access to the makerspace, loading dock or street. Any large door in this area with street access should be insulated both for weather and acoustic isolation.

The stage needs to be large enough to accommodate large ensemble casts, orchestral groups and choral groups. Sightlines on stage need to be considered in the stage layout in order to provide a full view of the stage from throughout the audience/seating area. The proscenium needs to be large enough accommodate the appropriate fly area, rigging, lighting, and curtains.

A lighting booth should be located at the back of the auditorium to allow for a clear view of the stage and allow lighting crew to control the lights on the stage and in the house. Dimmable house lights are needed to accommodate the various types of presentations that will occur in the auditorium. This lighting booth may also be used to run the sound board and is a needed instructional space allowing students to gain first-hand experience with the aspects of technical theater.

Auditoriums are incredibly sound-sensitive, so no matter the size or scope, a theater space's mechanical, electrical and plumbing system should be designed by engineers who have prior theater design experience. Ductwork must be oversized (and often lined) to eliminate objectionable fan and air velocity noise. In addition, plumbing chases should be independent of both house and stage perimeter walls. Acoustics and placement of lighting needs to be taken into consideration when designing the ceiling of the auditorium.

The theater classes partner with classes in the music department and these programs need to be in close proximity/adjacency to these courses to allow for collaboration and rehearsal. A performing Arts neighborhood would allow for such collaboration between these courses and with other arts course within this arts neighborhood. In addition, the performing arts programs require additional spaces for performance preparation. They need to be in close proximity to restrooms and have a space that can be provide privacy for costume changes. A dressing area, including a sink, with ten to fourteen private stalls (based on the average number of most current productions) could accommodate an ensemble cast while also provide a dressing area for student performers who might have more frequent or fast costume changes. in addition to areas to store costumes. There is also a need to have access to sinks for cleaning and working on sets. Additionally, the theater department needs adjacency to the visual arts department to allow for collaboration and to maximize the use of creative space for set design and construction.

As we design a facility that enables students to engage in rigorous learning activities and contextual innovative projects within their core academic settings, the goal is to implement a Maker Space style area within the performing arts region to support the students' ability to apply technical knowledge of safety procedures and practices in the use of theatre equipment, tools, and raw materials. Students need space to be able to develop and refine artistic techniques and work for presentation (Massachusetts Arts Frameworks- T.T.6) that support organizing and leading the production of technical elements such as scenic, lighting, props, costumes, sound, or makeup design in a dramatic presentation (Massachusetts Arts Frameworks- T.T.5). This area should be located close to the stage to allow for easy access and to support the creation and implementation of these major design elements for a main stage production. Large/oversized doors in this area stage will facilitate access to the stage.

A makerspace adjacent to the arts space would support such student work which is not appropriate for a general education/performing arts classroom, given the tools and equipment needed and the nature of this messy work. Once constructed, these sets will remain in place for an extended period of time allowing for performing arts students to refine their design and construction skills and to refine and complete artistic work (A.C.T.Cr. 03).

Additionally, Doherty envisions this space to be used by performing arts classes and extracurricular groups, e.g. for the musical, the theater club, the art club, etc. Currently, Doherty's performing arts classes and extracurricular organizations offer multiple theatrical productions throughout the year. Each of these requires set design and construction. Even after the sets are built, they remain built for lengthy period of time until the performance(s) is/are completed. Doherty classes and clubs build sets on the stage itself as there is no additional space available. This prevents the stage from being used by any other class, limits the use of the stage for group assemblies/presentations, or from any outside organization from using the space, during that time. The auditorium and stage are regularly limited or not available for general teacher use. During the 2019-2020 school year, due to overcrowding, several classes have been assigned in the auditorium. Numerous repeated comments made during visioning sessions noted the need for multiple performing arts spaces. Building/keeping sets on the stage in the auditorium would limit the performing arts space that is available for the school throughout the year.

Storage space is essential in the performing arts neighborhood. Music and theater classes both require specific and often over-sized materials, whether they be instruments, music scores or large props such as furniture or multiple small props. These materials are used as part of the instruction and to support the delivery of the curriculum, allowing students to have a hands-on, authentic performing arts experience. Space that is easily accessible with appropriate storage methods (shelves, cabinets, closets/wardrobes, instrument storage, prop storage, and set piece

storage, set construction materials such as lumber, paints and tools) and can be used to secure materials

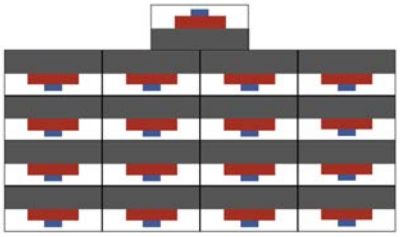
Access to technology is becoming increasingly important in all areas of the curriculum, including the performing arts. This collaborative space can also house the piano lab which will allow for increased opportunities for students to learn and practice the piano as well as experiment with music composition and arrangement and explore music theory. Piano labs that are equipped with a teacher-student communication system supports differentiated instruction in the music classroom allowing the teacher to instruct and support students with varying levels of proficiency within the same class. Students may work individually and in small groups in this setting to practice and refine their keyboard skills. Standard piano labs support between eight to sixteen students and need to be equipped to provide the teacher with a controller and headphones to monitor /listen to student progress. The lab needs to have individual student workstations/keyboards with headphones for each student.

The piano lab will be staffed by the music teachers and when a specific class is not scheduled into the piano lab during the regular seven-period day, it can be used on a rotating basis, under teacher supervision, to allow students the opportunity to work individually and in small groups to practice their skills both during and after the school day. As the lab will be staffed/supervised by the music teachers, there needs to be a teacher station with a conferencing system that allows the teacher to communicate with students and to supervise student progress. A standard piano lab with sixteen workstations requires a room that is at least 29’ x 24’ to accommodate each 5’x 5’workstation and a 4’ walkway and teacher workspaces.

Sample Configuration:
Figure 8

16 Student Class Piano Lab Room Configuration:

- 16 student workstations
- 1 teacher station



MINIMUM suggested room size for this configuration: 29' x 24'

Based on our recommended MINIMUM space for each workstation: 5' x 5'
and our MINIMUM walkway space and teacher workspace of: 4'

https://www.musicarts.com/cms/Classroom-Piano-Labs

A dedicated piano lab, staffed by the music teachers, will allow for individualized attention to students and differentiation of music instruction, providing support for music students at all levels. Students will be afforded the opportunity to study piano, something that is not possible for many students outside of school for financial reasons. Additionally, a dedicated piano lab will afford students with the opportunity to explore and create original music compositions as noted in the Massachusetts Arts Curriculum Frameworks (A.T.P.05) as well as to develop and refine artistic techniques and work for presentation (ASE.M.P.05). Between the music classes, both instrumental and theory, this lab would be utilized consistently throughout the day. Its adjacency to the music classrooms would allow for easy access for music teachers to bring their classes to the lab and to have visual access for supervision of individual students using the lab or practice and/or composition. This lab will help to support music skills and allow for cross- curricular sharing with the theater department as the two departments collaborate to provide instruction in musical theater both during and after the school day.

Collaborative spaces such as this can help students to listen to music and identify the parts of the composition as well as to learn to build their own musical compositions. This can be accomplished by establishing lab within the neighborhood than also can house desktop computers used for composition and can be shared with other performing and visual arts classes. This shared arts computer lab will provide opportunities for students to experiment with sound and composition through Musical Instrument Digital Interface (MIDI) software programs such as

GarageBand. This program allows students to explore music at their own pace while benefiting from teacher support in a group setting. Using GarageBand will allow students to build their own songs and to collaborate with their peers on compositions, experiment using virtual software instruments. This will require a computer lab space with room for desktop (Mac) computers to support this program. GarageBand allows students to record and listen to themselves. This shared lab will be used during the music classes and will be staffed/supervised by the music teachers. When not being used for specific music instruction, this lab will provide an opportunity for cross-disciplinary sharing and collaboration as students and teachers from other departments can utilize this space and program to record and listen to themselves to support fluency. Speaking skills are essential as noted in the districts' High Quality Reading, Writing and Discourse document and access to this program will benefit all students.

The dedicated teacher planning space will allow for collaboration among music, art, and theater teachers to support student work and collaborative projects in the arts. Production meetings as well as individual auditions can be held in this space.

Currently, Doherty staff's two full-time music teachers as well as one full-time theater arts teacher. All programs are full and wait- listed students are consistently looking for opportunities to join. In addition, the school infrastructure and classroom space currently limit the course offerings. Doherty intends to expand the teaching staff within the new building to better meet the needs of students in offering additional and more varied music and performing arts classes. As the program grows, there will be increased opportunities for teachers within the two departments-Theater Arts and Music-to collaborate.

Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

Doherty understands that these spaces exceed MSBA guidelines and are above and beyond the allotments within the template. However, the school's scheduling challenges, wait lists for programming, and student interest demonstrates the need for such space. Recent expansion of our visual arts program has added an additional art teacher allowing the school to plan to expand the current visual art courses to meet student interest and to alleviate the need for wait lists for art courses.

J. Physical Education/Health

The goal of the Worcester Public Schools Health and Physical Education Department is to provide students with the necessary skills which enable them to make safe and healthy choices in a variety of situations. In addition, students are given those skills which are needed to make

fitness a life-long habit. The Health and Physical Education Curriculum, which is aligned with the Massachusetts Comprehensive Health Curriculum Framework, is taught by certified Health and Physical Education teachers.

Doherty Memorial High School offers a semester (0.50 credit) courses in health and quarter (0.25 credit) courses in physical education (PE). The current 0.25-credit physical education course offerings include Physical Education I-IV.

At Doherty, Grade 9 students participate in Health I classes for a semester. The health classroom is not in close enough proximity to the gymnasium which precludes the type of collaboration that we would like to support between the Health and Physical Education teachers. The vision for the new school is to increase the number of health teachers and the number of classrooms to support the growth of the health course offerings. The School Adjustment Counselors deliver the Signs of Suicide (SOS) Curriculum through the health classes each semester in collaboration with the health teachers. We view this particular program as a vital component of social-emotional learning for our students since the content literally can be life-saving as the topics focus on recognizing and reporting signs of distress, depression and suicide prevention through the application of Acknowledge, Care, Tell (ACT).

All students participate in Physical education classes each of their four years for a duration of ten weeks per year and earn 0.25 credits. Students must participate in Physical Education each year in the state of Massachusetts and participation all four years is needed in order to graduate from the Worcester Public Schools. Currently, there are three Physical Education teachers who teach these courses in our gymnasium. The gym area is divided into three areas: the large gym, and two smaller spaces, one with a few treadmills, and the other with weightlifting areas and cardio machines. The majority of the weights and machines have been donated to the school, and the number of machines and weightlifting stations are insufficient given the number of students enrolled in these courses. The area is not large enough to fully implement the types of course offerings and fitness training that we would like to offer to our students. There is some office space for male and female physical education teachers, but these spaces need to be improved.

The vision for the new school is to substantially increase the size of our gym and the areas adjacent to it in order to increase the array of possibilities for our physical education courses and to better support our successful and well-established athletic programs. The number of teaching stations will increase to five and dramatically improve the space that is dedicated to physical education and health fitness habits. The office space for these teachers will be improved and expanded. There will be classes in team sports offered in the large gym area with a variety of activities in order to provide our students with options and to differentiate the concepts they are learning in order to meet their diverse needs. Storage space for equipment for these areas needs to be provided. There will be an area dedicated to weight training and conditioning sufficient to

accommodate the number of students who wish to participate in these types of activities. Additionally, there will be a space dedicated to classes including but not limited to yoga, Pilates, and mindfulness. As a result of these vastly improved spaces, we also plan to offer personal fitness, cardiovascular fitness, and conditioning courses. Also, we will be able to allow students to participate in additional physical education classes beyond the required, annual ten-week interval which is important to promote healthy habits and necessary for students who are unable to afford a gym membership in the community and for those who cannot stay after school for physical activities or athletics due to other responsibilities such as work or caring for younger siblings.

This expanded space will also support an array of after school programming. Many students participate in weightlifting activities after school. A powerlifting club was started last year and has generated much interest and participation among our students. We also have evidence of a strong interest among our students in yoga as this was offered as a club activity after school and was well-attended by staff and students. We also have had dance clubs who could benefit from this new space after school and the choreography for the musical could be done in this wellness center rather than in the front lobby or in the cafeteria where choreography has been done historically due to a lack of appropriate space. Students will have a voice in selecting activities within which to participate and a wider array of physical activities from which to choose. The improved space will allow us to work with our students to develop the knowledge and skills needed for lifelong wellness, healthy habits for life, strength training and stress reduction.

There are no specialized provisions envisioned for these Physical Education spaces. Rather, they will provide options for the school's various athletic teams and extracurricular groups more appropriate space for a wide range of work and activities. Currently, some teams or groups practice or work in hallways or crowded areas.

Additionally, there needs to be a space for Adaptive Physical Education (PE) as the number of students in need of this service will increase as the new school will be fully handicapped accessible, while currently the school is not. As a result of the lack of accessibility in the current facility, many students who need Adaptive Physical Education attend other schools in the district as their needs cannot currently be accommodated. The Adaptive PE space will be utilized by students receiving special education services. As the program grows, the school hopes to establish and strengthen its unified programming options, thus providing additional opportunities for special and general education students to collaborate.

As the SD process continues, the committee will be designing and including additional information for review.

We are also seeking to add a Unified Physical Education program to build upon our current participation in Special Olympics and to involve our students with disabilities by pairing them with their peers during physical education classes as well as during our after-school programming. This space would also be used to host unified physical education with the younger students in our quadrant, to build and to strengthen the relationships between and among our neighborhood schools, and to increase our participation in Special Olympics especially during vacation and summer school programs.

Athletics

Our athletic program is extensive, and our athletes are successful. Our students are participants on 49 sports teams sanctioned by the Massachusetts Interscholastic Athletic Association, MIAA: 18 in the fall season, 14 during the winter season, and 17 during the spring. Not only does our participation in athletics support the success of our student-athletes and their ability to compete and to continually develop and improve their skills, both on and off the courts and fields, but it also fosters a strong sense of community, school spirit and pride among our student body, staff and members of the community at large**.** DMHS has a long history of success in athletic competitions and our school has had the highest rate of participation in athletic programming over time in our district as shown in the tables below for all three seasons. (Figures 9-11)

Figure 9

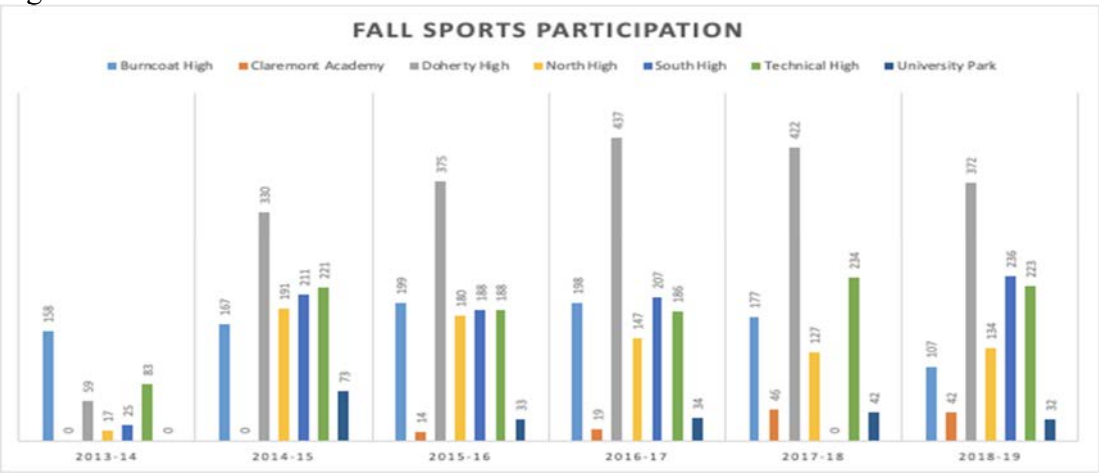


Figure 10

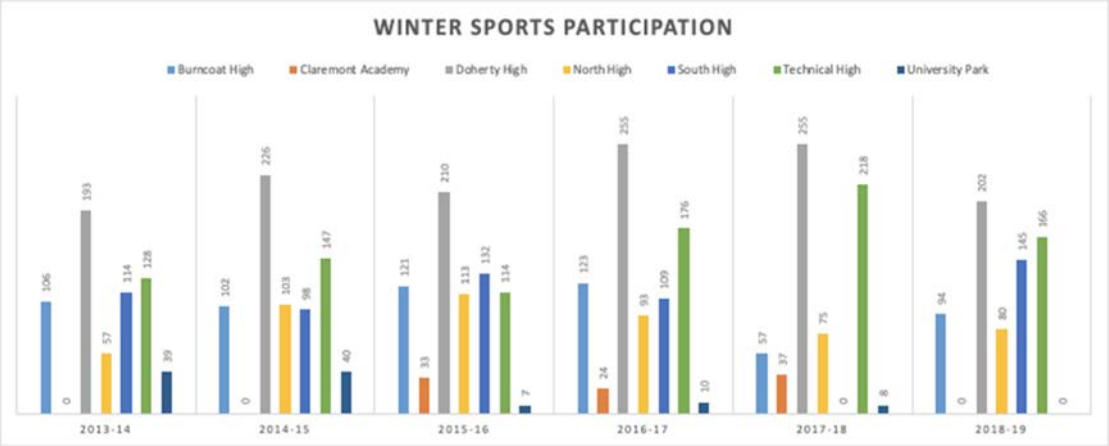
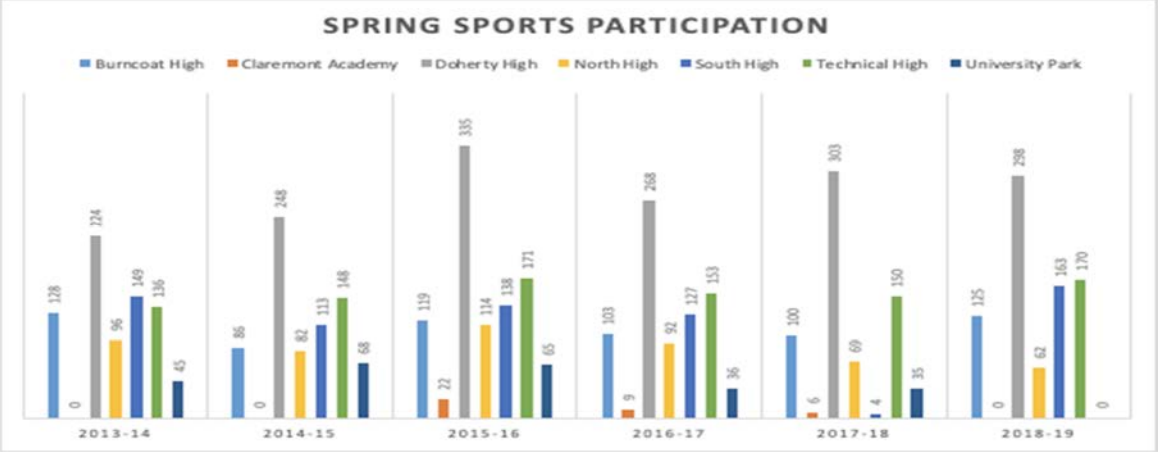


Figure 11



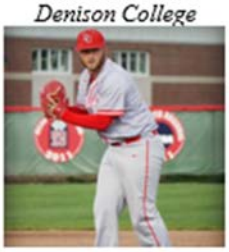
Several of our student-athletes have gone on to participate in athletics at the college, semi-pro, and professional levels. Among our alumni, staff members and coaches, there are many who have been inducted into the Worcester Public Schools Athletic Hall of Fame. However, our current facility does not support the athletic programming in a manner that is both desired and deserved.
The images below identify some of our recent student- athletes who went on to compete at the collegiate or professional levels.

Figure 12


WHO WILL BE THE NEXT
GREAT HIGHLANDER?
STATE CHAMPIONS
1980
2013
EVAN BRUNELLE
MIAMI
RHAKIM WILLIAMS
UCONN
AARON ADU
TEMPLE
ALFRED ADARKWAH
UMASS/WAGNER
NOAH ROBINSON
MISSOURI
YAWIN SMALLWOOD
UCONN - ATLANTA FALCONS
ISAAC YIADOM
BOSTON COLLEGE - DENVER BRONCOS

Figure 13

Adam Goldstein
Denison College



Evan Brunelle
University of Miami

Tyler Sterner
University of Rhode Island
Drafted by
Cincinnati Reds

Aaron Adu
Temple University

Jewel White
Franklin Pierce College

Wadeline Jonathas
University of South Carolina
(NCAA Champion)

Francesca Hammond
Anna Maria College

Kaiya Saunders
University of Virginia

Rahkim Williams
University of Connecticut

Noah Robinson
University of Missouri
Canadian Football League

Tavian Vassar
Bucknell University

Isaac Yiadom
Boston College
Denver Broncos

Luke Brennan
Salem State University

Yawin Smallwood
University of Connecticut
Atlanta Falcons/Tennessee Titans

During the fall season, the only team who can practice outside on our campus is the football team. This team practices on a non-regulation field that measures approximately 85 yards in length, rather than the 100 yards of a regulation football field on which they compete. The junior varsity and varsity teams practice together which is not an optimal situation. The boys' and girls' varsity and junior varsity soccer teams practice and compete at Foley Stadium and they have to walk there in order to do so. The field hockey team practices on a small patch of land outside of the stadium at Foley Stadium. It is approximately one mile from the school and having the athletes walk from school to the stadium presents an ongoing safety concern. During the fall season our student-athletes also participate in field hockey, cross-country track, boys' golf, crew, girls' volleyball, and cheerleading. During inclement weather many of these groups compete for indoor practice time as our current gym is too small for them to schedule practice simultaneously.

The issues of the inadequate size of our gym are most evident during the winter season when practice is scheduled in two-hour intervals from 2:00 p.m. until 9:00 p.m. During the winter season, our student-athletes participate in boys' and girls' varsity and junior varsity basketball, hockey, swimming, wrestling, cheerleading and boys' and girls' indoor track. From 2014 to 2018, we housed wrestling practice at our school, but that program has since been relocated to another high school within the district due to lack of space despite high rates of participation by our students. This results in the need for the team to travel for practice and competitions. The girls' and boys' track teams both practice in the gym for hurdles, high jump and shot-put but run throughout the hallways of the school as there is no track in our facility. Not only does this practice jeopardize the safety of these student-athletes, but it is also unsafe for any student and/or teacher who has remained after school to walk safely through the building as they go from one location to another or simply exit the building upon the completion of their after school extra help session or club activity. It is unsafe for the night custodians who work from 2:00 p.m. to 10:00 p.m. and/or any school plant employee who may be in the building making repairs so as not to disrupt the school day. There is a dire need for an indoor track, elevated or at ground level, that is at least 133 meters in length to be a part of the new school design to safely accommodate the large number of students, (75 last year), who participate in this sport at Doherty.

During the spring season, our student-athletes participate in varsity and junior varsity baseball and softball, boys' volleyball, tennis, boys' and girls' lacrosse, boys' and girls' crew, and boys' and girls' outdoor track. The boys' volleyball team has limited space within which to practice especially during inclement weather as the softball and baseball teams need to use the net in order to practice indoors safely and the net needs to be removed for volleyball practice and games. To install the net and up then to remove it requires 30 minutes which leads to even less time for the teams. Similar to what occurs during many of the fall sports, the student-athletes who participate in baseball, softball, lacrosse and track have to walk to Foley Stadium or to Beaver Brook Park for practice and/or be driven to other locations for practice, games and competitions. This is an ongoing safety concern. The boys' and girls' tennis teams practice at the public courts at Newton Square adjacent to the school but not on our property.

Despite these conditions, our teams have been and continue to be successful. In 2013, the football team won the state championship at Gillette stadium. That was a wonderful event for the athletes, their families, the students, and our entire school community. Our teams compete and qualify for district play in varsity sports every year and often secure winning titles.

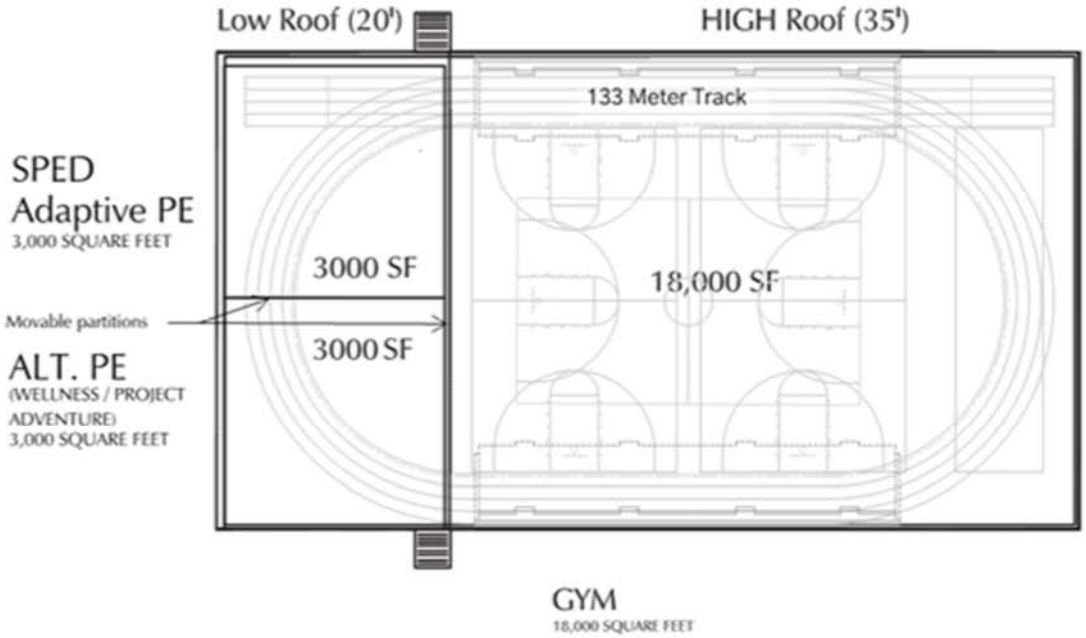
Often, we are forced to disallow large numbers of our fans, students and family members alike, from attending our games due to the inadequate capacity of our gymnasium and the need to respect the limits needed to comply with fire code and to avoid safety concerns that result from overcrowding. Not only does this deny the school and district of much needed revenue for our

sports programs, more importantly it disallows all members of our school community to gather together in order to support our teams.

Equally disappointing, when our students have qualified for home court advantage they have been forced to compete at gymnasiums located in other high schools in the district that are larger but certainly not our "home." The boys' basketball team has been one of the top basketball programs in central Massachusetts for the past 25 years, but they have yet to play a quarterfinal playoff game in our gym due to the attendance rules of the MIAA and the capacity of our facility. This injustice has occurred in 1997, 1998, 2008, 2010, and 2011 and our team has had to find alternate sites to "host" a home court advantage playoff game each time.

The vision for the new facility includes a space large enough for us to gather the entire school population not only for games but for assemblies and academic recognition ceremonies, guest speakers, special events and to provide trainings. There needs to be a way to secure the gym area from the academic areas of the building so it can be utilized as a community space without compromising the safety and security of the building. Currently, we are unable to secure the gym area due to the necessary fire egress so anyone who enters the gym area has access to the entire building which is a concern for the security of the school. Some of the locker room areas, the small gym area and some shower spaces have been converted to be used as a weight room with weights and equipment that have been donated from Good Sports and Planet Fitness. While we appreciate their generosity, the equipment is being used in a less than an optimal space and much of our equipment is less than state of the art. Our students deserve to have a state-of-the-art facility with proper equipment.

In the new facility, we envision our students having space for weightlifting, conditioning, adequate locker rooms for home and visiting teams with showers and white boards, and a wellness center with good sight lines to all areas to ensure the proper supervision of students. We would like to have three full courts to allow more than one team to be able to effectively practice simultaneously. Our physical education classes will also benefit from this improved space as they also need lockers, boys and girls locker rooms and access to showers. There is also a need for storage space for team equipment in addition to storage needed for the equipment used by the Physical Education teachers.



The 3,000 square-foot wellness center and the adaptive PE spaces are planned to be adjacent to the 18,000 square-foot Gymnasium, separated by modular partitions with a lower 20' ceiling. The spaces are organized to support the day-to-day Physical Education program needs within the area allotted by the MSBA. After school hours, the modular partitions may be opened to accommodate a 133-meter indoor track for track practice, for unified sports and for maximum flexibility for the overall school.

Also, we are seeking to add fields in the new facility. The football team would benefit from having a regulation field on site with lights, bleachers, and a press box that could be used for games and practices. The track program would benefit from having a track outlining the football field. The vision includes another 80-100-yard multi-purpose field to be used for soccer and field hockey during the fall season and to be used for lacrosse in the spring and the inclusion of baseball and softball diamonds with bleachers and lights. Finally, the addition of two outdoor basketball courts and two tennis courts would allow us to keep our students on campus and end the practice of having to walk anywhere which we see as a safety concern.

The physical education curriculum throughout the year allows students to explore different athletic and wellness-based activities. Students will engage with these activities, many of which will utilize age-appropriate or industry-standard equipment. When not in use, to ensure safe

storage to prevent damage, as well as to provide an uncluttered space for student safety, this storeroom is critical to provide for an effective Health and Physical Education experience for all students.

All external spaces, including the fields, would be supported with WiFi access.

K. Special Education

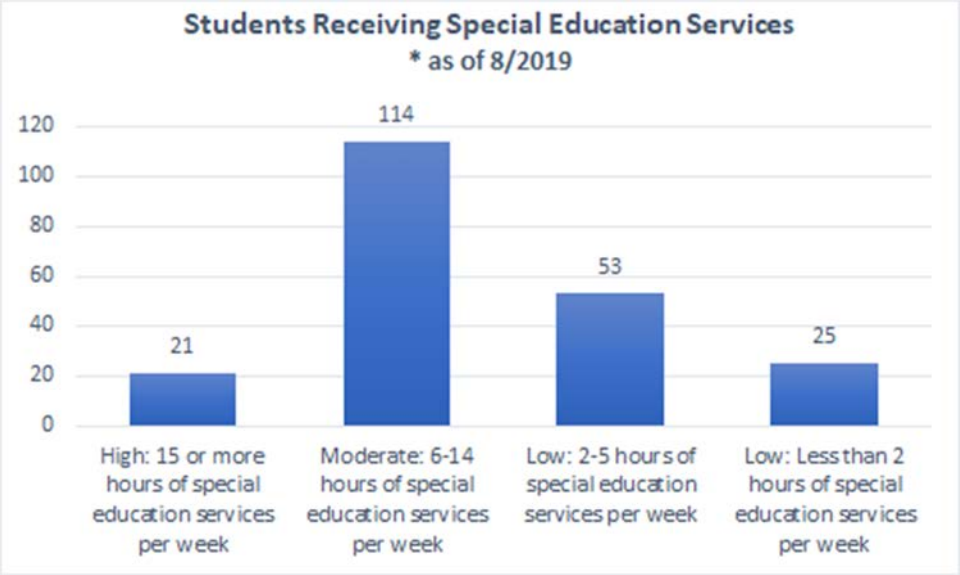
The mission of the Worcester Public Schools Special Education Department is to provide support, technical assistance and service to schools, staff, students, families and community stakeholders as we work collaboratively to promote safe schools where all children learn. The department is committed to partnering with parents and schools to ensure the fidelity of specialized instruction, inclusion opportunities, professional learning and rigorous outcomes for students with disabilities. Doherty Memorial High School offers a variety of full year (1 credit) courses to support student needs to access the curriculum and to make academic progress. Students receive services in accordance with their Individual Education Plan (IEP). Some students receive classroom services in dedicated Special Education classrooms: resource class, Structured Therapeutic Education Programs (STEP), and Life Skills. Other students are served by the inclusion model (either full or partial) with support in general education classrooms. In addition, some students receive supports such Occupational Therapy, Physical Therapy, Speech and Language therapy, Learning Disability support (LD) or a combination of such supports an indicated in their IEP. Additional supports such as Adaptive Physical Education are taking place in the school's gymnasium.

The curriculum is delivered in the Special Education classrooms using varied, individualized and differentiated strategies to meet the needs of all learners. Instructional methods include whole- and small-group -instruction, modeling of strategies, use of both oral and written use of language, use of manipulatives and other hands-on learning tools, whole- and small-group discussion such as modeling read-aloud and think-aloud skills, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills. While this is the goal in all classes in the Special Education department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Students' IEPs identify specific academic and/or social and emotional needs and these students receive a specific number of hours of support as indicated in their plan. Table 15 indicates the number /hours of students receiving Special Education services as of August 2019. Disabilities currently addressed include autism, communication impairment, intellectual impairment, neurological impairment, emotional impairment, health impairment, and specific learning

disability, and/or multiple disabilities. We anticipate this number to grow as the enrollment in the new Americans with Disabilities Act (ADA) compliant school increases and we are able to serve more students with identified needs.

Figure 14



In accordance with Massachusetts education laws and regulations (603 CMR 28.06) students with disabilities, to the maximum extent appropriate, are educated in the least restrictive environment (LRE) and supporting an inclusive environment for students. The Special Education classes at Doherty Memorial High School are not all located exclusively in one area of the building in order for eligible students to maximize their inclusion into the life of the school as noted in the MSBA Special Education Rubric and Regulations. While these classrooms are integrated into the general education classroom areas, they are not integrated as well as they could and should be to support the needs of our students in our current facility. Currently, students with IEPs have access to school facilities including but not limited to implement the students' IEPs. While the present resource rooms and separate classrooms for students with disabilities (STEP, Life Skills) are given the same priority as general education programs, including access to and use of instructional and other space /facilities in the school, this could be improved to better serve the expanding student population and anticipated needs of future students once when we are in the new school which will be ADA compliant.

Three of our current classrooms that are used for resource rooms are divided into two semi-separate spaces and shared by two teachers. While this may foster some level of collaboration more often it serves as a distraction for students, such as an open classroom concept would do. One of these "shared" spaces is home to two of our three STEP classrooms. The third STEP

classroom (104) is located near the music and theater areas and those performances serve as a distraction to students as well.

The clinician, who is an integral member of the team to support the STEP students, is housed in an area that was converted to an office space located near, but not next to the split STEP classroom. We anticipate increasing the number of clinicians to two in the new facility. In order to truly provide support, the clinicians each need a larger space and one that is more centrally located among the current three and anticipated four STEP classroom spaces. These spaces need to be equipped with appropriate technology and be large enough to accommodate meetings with members of the Special Education department, community service providers, parents and students as well as individual and small-group counseling sessions and provide a comfortable safe-space for students in crisis.

The Life Skills students are currently housed in one of the smallest spaces in the school and must enter that space by passing through a different classroom, something that poses a distraction to both the students in the classroom and the Life Skills students. The students in this program need an expanded space to effectively meet their needs and access to additional space to successfully teach the adult learning skills.

The vision for the new school is to have intentionally placed classrooms, sufficient space and learning centers to effectively meet the academic and social emotional needs of our students. We will not add any additional programs nor will we eliminate any current programs. We will maintain the current programming but will be ADA compliant. DESE suggests that instruction group sizes be kept small (ten to twelve students) indicating a need for classrooms that are approximately one half the size of other classrooms in the building but large enough to accommodate this recommended size group with flexible seating to accommodate student and instructional needs, access to technology, using both the distributive and stationary model (desktop computers to meet student needs as identified in IEPs) and adequate storage for materials to support individualized and differentiated instruction. Additional space needs to be dedicated to accommodate the anticipated increased programming and staffing. As we move into a more inclusive model there is a need for more inclusion classrooms and collaborative learning spaces. Additionally, we need a place for the Evaluation Team Chairperson, (ETC) and for the additional clinician that we expect to add to support those students with social-emotional needs. We anticipate the number of students enrolled in our STEP program to increase necessitating the change from three to four classes given the number of students involved in this type of program currently throughout the district and across the grade levels, K-12.

A conference room is needed to hold IEP and progress meetings to engage the families, team chair, regular and special education teachers in a welcoming and private space to respect confidentiality and the integrity of the team process. A designated, private meeting area needs to

be included to hold Special Education meetings with teachers, specialists, and parents. The Special Education Department head requires office space with access to technology and storage for materials to support differentiated and individualized instruction within the department.

The School Psychologist is responsible for psychological testing and evaluation students. The school psychologist, working in conjunction with members of the Special Education departments, in addition to the Evaluation Team Chair (ETC) requires a private, quiet space for testing with access to appropriate technology and meeting rooms for consultation.

Additionally, the ETC needs office/meeting space with access to technology to plan and coordinate student IEP meetings which is in close proximity to Special Education conference room/meeting space in order to facilitate meetings with teachers, school psychologist, adjustment counselors, Special Education teachers, and parents.

With the planned addition of the Grade 9 academy, there will be a need to incorporate Special Education classrooms into this neighborhood to provide appropriate support for these students. In order to support the special education needs we are planning to attach one learning center (resource room) teacher and one inclusion teacher to each of the four Grade 9 academies. For students in Grades 10-12 we plan to have a learning center specialist (resource room) and two inclusion classrooms ~~space~~ attached to each of the four major subject areas: ELA, Social Studies, Mathematics and Science in each of the three Grades 10, 11, 12. The special education classrooms and spaces will be integrated into the core academic spaces. This model will allow for flexibility as the numbers of students receiving full inclusion or partial inclusion services change. ~~We are striving for the most inclusive environment while providing all of the support needed for success and in full compliance with all IEP's which supports the need for additional and flexible space which will allow for grouping and supports.~~ Common spaces in each of these academies/neighborhoods will be used to support small group instruction as well as pullout instruction provided by special education teachers and other Special Education staff/counselors. We envision a flexible space to provide for multiple orientations and uses, with flexible furnishings to account for current and future needs.
Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

Multiple settings for small group and individualized instruction and supports, located in the various neighborhoods and in close proximity to general education classrooms will support an inclusive environment for all students with or without disabilities and promote greater equity and access to instruction and school programs.

We are striving for the most inclusive environment while providing all of the support needed for success and in full compliance with all IEP's which supports the need for additional and flexible

space which will allow for grouping and supports. To that end, the District has taken/is taking steps to support this shift to a more inclusive model of instruction. There have been several professional learning opportunities geared toward supporting the success for all students, particularly focused on the delivery of curriculum, instruction, and interventions. Training has been provided at the district and school levels to effectively meet the needs of our Special Education students. The exchange of effective strategies and practices among and between general education teachers and special education teachers is invaluable to inform their co-teaching. The district is committed to continuing to provide training to support the successful implementation of all Individualized Education Plans and to provide the necessary staff to support all Special Education programming including but not limited to inclusion specialists, behavioral specialists, and paraprofessionals necessary to remain within the regulations that govern Special Education in Massachusetts and to educate all students in the Least Restrictive Environment,(LRE).

Within each area there needs to be space designated for different levels of special education services/classrooms: full inclusion, partial inclusion, and resource classroom. These classroom spaces will be outfitted, with respect to technology and infrastructure, like all other classrooms in the building, and will follow a consistent room numbering scheme that will be identified later in the design process. Within the Special Education classrooms there needs to be space to allow for flexible grouping including areas for students who need to work one-to-one with a teacher or have a quiet space, free from distractions, to work individually in accordance with the students' IEP. Classrooms need to be equipped with appropriate furniture and equipment to support identified student needs including but not limited to flexible furniture, lavatory facilities, and accommodate spatial requirements as well as acoustical and lighting treatments to remove physical communication barriers for students who are visually impaired, deaf, or hard of hearing. The classrooms also need to have access to technology and use both the distributive technology model as well as stations with desktop computers to support student needs as indicated in the IEPs. Classrooms need to be equipped with appropriate technology including Epson bright link short throw projector, LED display is desired with screens that support both independent or mirroring displays, document camera, Chromecast/apple TV and speech reinforcement. These rooms also need to have adequate and appropriate storage for materials needed for teachers to support differentiated and individualized instruction. No specific signage identifying rooms as “resource room” or “special education’ will be used.

Learning Disabilities classrooms need to provide pull-out space, complete with access to technology, for teachers to work with students. We currently have one full-time and part-time LD teacher. With the anticipated increased enrollment in the new school, there will be a need to expand the LD supports to meet the needs of the expanding student population. As a result, an additional LD space will be needed. One such LD space needs to be located in the Grade 9

Academy neighborhood to provide academic support for these students, especially as they struggle to make the transition from middle school to high school.

There needs to be an improved space for Occupational Therapy and Physical Therapy as these services will be expanding as the new DMHS will meet ADA requirements and students whose IEPS indicate that they require these services will no longer need to attend other high schools in the district due to accessibility issues at the current building. A designated space is needed to provide Occupational Therapy for students. This area will provide services for students with identified special needs in fine and perceptual motor skills development. There is a need to support the OT specialist to provide evaluation, consultation and direct services for students. Additionally, there needs to be a space dedicated to providing Physical Therapy services for students with demonstrated special needs in gross motor development. The PT specialist provides evaluation, consultation and direct services to students in accordance to the student's IEPs. A Speech and Language therapy area/classroom is needed to allow the speech pathologist to provide speech and language therapy for students with receptive and expressive language interferences which affect their ability to make effective progress. This area needs to be able to accommodate both individual and small- group sessions. Each of these spaces (OT, PT, and Speech/Language) need to have appropriate access to technology and space for the specialist to store and secure materials.

With the anticipated increased enrollment in the new school there is a need to increase the space needed to service students with these identified needs. The Life Skills classroom needs to be fully ADA compliant with direct grade level access to outside areas to support interaction with the school's outdoor spaces which can enhance instruction through interaction with outdoor educational spaces such as the school garden.

The addition of an Adult Daily Living (ADL) Center to enhance student independence in their living and work environment is an integral part of the plan for the new school. The center would provide an area to support students in the Life Skills class that would teach skills for day-to-day living. This area would need to provide model areas where students can learn such skills as using a washer/dryer, dishwasher, stovetop, oven, and other household appliances, as well as basic work skills. While students would have the opportunity to practice work skills in the school store, the ADL would provide workstations to teach skills needed for working with cash registers, and learning skills such as sorting, folding, labeling, and packing items.

Vocational Learning Center

Vocational training provides students with the opportunity to master the skills needed in order to be successful not only in school but in life. The vision for the new facility is to design learning opportunities for our special education students to engage in real-world experiences throughout

the school. The licensed staff will teach and practice the specific job-related skills during their class time and these students will utilize this knowledge both in their classroom and in a variety of locations throughout the building. For example, students may work in the school store, the offices, and help to maintain the school garden. By doing so, they will be prepared to participate in our community as they develop vocational skills needed for their futures.

Study Skills

Study Skills is a course taught by licensed Special Education teachers that is often included as a part of a student's IEP. During this class, students learn note-taking strategies, test-taking tips and skills associated with time management. These skills assist these students in their academic coursework as they are able to apply this knowledge to their other coursework with the support of a special education teacher who can clarify any misconceptions and help students to review and practice using the skills and academic concepts from their other classes. This class time can also serve to allow for extended time for academic tasks as is also often a part of an IEP.

Coping Room

The coping room, designated as the Social Emotional Learning Center, is a space where students can receive academic and social and emotional support. To be assigned to the coping room, students would have received a referral from an administrator for a certain amount of time. During this assigned interval, students would complete academic tasks as assigned by their teachers while also receiving the support and coping strategies and proactive problem-solving skills needed to successfully transition and return to their regularly assigned schedule of classes.

It is not critical for this space to be adjacent to the Media Center.

L. Vocational and Technical Programs

Chapter 74 Programming

With the proposed new Doherty Memorial High School, the Worcester Public Schools is looking to strengthen and expand the Chapter 74 offerings. A formal Chapter 74 Programming Submission was created and submitted to the MSBA.

Doherty Memorial High School currently offers an Engineering and Technology Chapter 74 Program. The goal is to offer three additional trade programs within the new design.
Table 9

Chapter 74 Program Offerings	Current Enrollment	Proposed Capacity	Comment
Engineering & Technology	380	400	Existing Program, space to be expanded
Programming & Web Development	0	~~200~~ 160	New Program
Marketing Management & Finance	0	~~200~~ 160	New Program
Construction Craft Laborer	0	~~150~~ 120	New Program
Total	380	~~950~~ 840	

Each vocational program will be available to all students from across the district. Similar to current policy, all Worcester residents in grade 8 will be eligible to apply for admission to any of these four programs. There is no plan to create a ninth-grade exploratory program. Rather, the application will ask students to identify their desired program, and if there are multiple areas of interest to then provide a ranking in order of their preference.

Engineering and Technology

The Engineering and Technology Academy (ETA) vocational program serves students from across the district, and each year has more students applying than the current space can accommodate.

The ETA vocational program was certified 10 years ago and utilizes an approach to integrate the trade skills and knowledge within the academics. Students in the ETA are teamed, meaning they share the same Engineering, Science, and Mathematics teacher. These teacher blend curriculum, cross-train skills, align standards and expectations, etc. and as such when combined the students are engaging with their vocational curriculum for 3 out of 7 periods of their day. While the vocational program calls for the integrated academics of math and science specifically, our ETA program also teams the Social Studies and English Language Arts classes, resulting in a thematic alignment for almost 70% of the students' day. There are 9th and 10th grade interdisciplinary teams. Doherty does not run a week-on, week-off schedule.

Doherty's schedule includes a 7-period day. Students in the ETA share 5 common classes together, which includes three vocational periods (out of 7) each day. Teachers, including vocational teachers, have 5 instructional classes each day, with a combined maximum student load of 125 students, per the Worcester Public Schools' contract. Due to safety considerations,

some classes- including the Engineering classes-are capped so that their enrollment allows for safe access and utilization of the related shop areas. For example, all 9th grade ETA teachers have a maximum load of 100 students (5 classes x 20 students, as 20 is the maximum allowed within this vocation). Thus, at any given time there would be a maximum of 20 students working within any of the vocational or classroom spaces. Combined, there are 100 possible ETA students within each grade for a total of 400 students.

For example, a traditional 9th grade schedule would appear as follows:

Period 1 - English I
Period 2 - Geometry (integrated academics)
Period 3 - Biology (integrated academics)
Period 4 - Introduction to Engineering (vocational)
Period 5 - World History II
Period 6 - World Language
Period 7 - Health, Physical Education

During the school day, Engineering classes run simultaneously for grades 9-12. This results in 2-4 vocational classes running simultaneously during each period of the school day. Given the highly technical nature of the vocational curriculum, students are often accessing the classroom spaces- which would include computers, graphic design software, curriculum resources etc.- along with the vocational spaces each day.

During the school day, Engineering classes run simultaneously for grades 9-12. This results in 2-4 vocational classes running simultaneously during each period of the school day. Given the highly technical nature of the vocational curriculum, students are often accessing the classroom spaces- which would include computers, graphic design software, curriculum resources etc.- along with the vocational spaces each day.

The ETA program will serve approximately 100 students in each grade – up to 400 total. This comprises approximately 24% of the expected population of 1670 students. Students completing all CVTE requirements receive a technical certificate, in addition to their diploma. Given the complex content knowledge required for work in the career, our primary goal is to provide students with a strong foundation in content knowledge along with skills so that, as students enter college, they are well prepared to continue their engineering/technology education. From a review of local (Massachusetts) and national labor market projections, there is a clear demonstrable need to students to enter this profession, albeit by first earning some level of post-secondary education.

The ETA serves approximately 100 students per grade. This corresponds to a 20:1 student to teacher ratio. In the Worcester schools, teachers are assigned five classes each year, and the ETA currently has four CVTE Engineering teachers. There is no planned change to this enrollment pattern for the new school.

The minimum required laboratory space for a class of 20 students is 2200 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students at the same time. The proposed program will be implemented with four related-theory engineering classroom spaces paired with three shared laboratory spaces. Given the nature of the curriculum, each of the four related-theory engineering classrooms will require a 1:1 desktop computer to student ratio. It is necessary to have desktop computers in this area as the necessary software cannot be run on the Chromebooks. In order for students to engage with the curriculum in a range of rigorous and differentiated learning activities, additional space and furniture is needed for students-when not utilizing the computers-to work collaboratively. The desired classroom/laboratory layout would establish the computer stations together, paired with an educator's desk and presentation space, at one end of the classroom. The other end of the room would include desk/table space, supported by technology, presentation space, wall space, etc. where students can work collaboratively on project-based work in variable-sized groups.

Within this team model, students in the ETA are also receiving vocational instruction within their science and mathematics courses. Thus, the engineering classrooms (four) and associated science and mathematics classrooms that compose the vocational program need to be adjacent to each other. These classrooms are considered related-theory classroom spaces. Based on the teaming models and other factors, the goal within this design proposal is to establish four related theory classrooms with adjacency to the engineering classrooms. Two would serve the Science integration, while two would provide space for the Mathematics.

The Engineering and Technology program's design includes three shop areas. These represent separate, albeit spatially adjacent and accessible, spaces in which different aspects of the vocational curriculum can be implemented. For example, Doherty currently has two-very undersized-shop areas. One houses typical construction and fabrication equipment, used primarily for wood-based projects, including a range of power tools, saws, sanders, drills, etc. The second shop area houses equipment such as 3D printers and fine milling machines. A third major component of the engineering curriculum includes electrical work, including analog and digital circuitry analysis, robotics, programmable logic controllers, etc. Currently, most of this work occurs in a classroom, but this requires staff to reorganize their space when this equipment is needed, e.g. moving computers to the side, setting up equipment, breaking it down each day to account for other classes coming into the space, etc.

Throughout the four years, students are interacting with varied tools and equipment as they engage with the curriculum. Some of this laboratory work is reinforced and strengthened from year-to-year, and so the engineering technology program requires multiple laboratory spaces, each outfitted to support the different skills being developed. These spaces can be accessed and shared by all educators within the program. Current industry and post-secondary trends, and as identified within the curriculum, demonstrate the need for three distinct shop spaces: one to support manufacturing and fabrication skills, such as wood-working or machining; a second laboratory space to support the electrical engineering, circuit design, robotics and programmable logic controllers, and testing; and a third to enable students to engage with 3-D printing, prototyping and CNC technologies. As industry and post-secondary trends change, these three spaces can change and be updated accordingly. During the design phase, adequate ventilation and appropriate safety measures will be provided and accounted for in all necessary spaces.

The three shop areas would allow for dedicated spaces for the three currently designed major vocational skill sets. As industry standards and technologies change in the coming decades, these spaces provide flexibility in the school's ability to deliver the curriculum to such a large population.

To promote professional collaboration and support, the four program classrooms and 3 shared laboratory spaces should be in proximity with each other. Given the numerous and varied consumable materials, tools and equipment needed to effectively implement the curriculum, each laboratory and classroom space needs appropriate storage options. Staff will need a common educator office and planning space. These program classrooms, laboratory spaces, storage and staff spaces should be designed together, and this vocational program will be adjacent to a ninth and tenth grade cluster of academic classrooms. The Engineering Technology vocational program area should also have adjacency to the proposed Construction Craft Laborer vocational program as students and staff will be able to utilize both sets of laboratory spaces as appropriate within the curriculum. In addition, the laboratory spaces should have exterior access so that large materials, machines or equipment can be delivered and stored or installed. Two of the laboratory spaces (manufacturing/fabrication space as well as the CNC space) should have dust collection systems, and shop sinks.

There are no plans to contract or discontinue the Engineering program at Doherty Memorial High School. Rather, the goal is to create a space that builds upon our existing program in this area, enables students to work safely, with up-to-date technology, and in a space that enables students to work collaboratively in a range of learning activities. The goal is also to provide space so that the class does not have to be broken into groups, each under additional supervision, or to have to identify work-around solutions to the current set of deficiencies as explained in the Chapter 74 Programming Submission.

New Vocational Programs

Doherty is currently seeking Chapter 74 approval for three programs: Programming and Web Development; Marketing, Management and Finance; and Construction Craft Laborer. For each, Doherty has begun to lay the foundation by offering introductory coursework within the curriculum. Doherty intends to add additional coursework and staff to the maximum extent possible so that each program is established as we then transition to the new space.

The three proposed programs will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in each program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed. The table below shows likely course offerings at each grade level.

Sample Student Schedule:

	Grade 9	Grade 10	Grade 11	Grade 12
CVTE Curriculum	Grade 9 CVTE	Grade 10 CVTE	Grade 11 CVTE	Grade 12 CVTE
CVTE Related Theory (RT)	Grade 9 RT	Grade 10 RT	Grade 11 RT	Grade 12 RT
English	English I	English II	English III	English IV
Mathematics	Algebra	Geometry	Algebra II	Pre-Calculus
Science	Biology	Chemistry	Human Anatomy	Physics

World Language (assume that student needs at least 2 years to be college ready)	Language 1	Language 2 (at minimum, need to start the 2 year sequence in grade 10)	Language 3 (possible)	
Social Studies	World History II	US History I	US History II	
Credit total	7 credits (full schedule)	7 credits (full schedule)	7 credits (full schedule)	5 credits
Additional elective offerings				
Art/Music/ Computer Science/ Theater, other 1 credit electives	None available (unless move language to year 2)	None available	None available	Possible options

AP Classes	AP Human Geography not available (unless move language to year 2)	AP Human Geography, AP Statistics	Some options of an AP class in lieu of their core academic requirement (e.g. AP English Language for English III).	More options available

The Worcester Public Schools anticipates hiring four new teachers to serve all students within each Chapter 74 program. This will correspond to 1 teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. For the 2019-2020 school year, Doherty Memorial High School laid the foundation for each program by offering introductory courses.

Given Doherty's expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of 'shop' time followed by another period of related theory supporting the curriculum. This will correlate to one teacher per grade.

At full enrollment, Doherty will offer 4 years of vocational instruction. As an example, below shows a potential teacher schedule within this vocational program and how the space will be utilized. Each teacher will have 2 sections of their respective vocational and related theory courses.

Sample Teacher Schedule (at Year 4)

	Grade 9	Grade 10	Grade 11	Grade 12
Period 1	CVTE Curriculum (sec 1)	CVTE Curriculum (sec 1)	Additional Course	CVTE Curriculum (sec 1)
Period 2	RT (sec 1)	RT (sec 1)		RT (sec 1)
Period 3	Common Planning Time	Common Planning Time	Common Planning Time	Common Planning Time
Period 4	CVTE Curriculum (sec 2)		CVTE Curriculum (sec 1)	CVTE Curriculum (sec 2)
Period 5	RT (sec 2)	CVTE Curriculum (sec 2)	RT (sec 1)	RT (sec 2)
Period 6		RT (sec 2)	CVTE Curriculum (sec 2)	Additional Course
Period 7	Additional Course	Additional Course	RT (sec 2)	

Programming and Web Development

Students enrolled in this program will receive skills training that falls under the Professional and Tech Services industries. The program curriculum includes programming fundamentals, algorithm-based thinking, visual programming and game development, professional applications, robotics, and will include Advanced Placement coursework in Computer Science Principles as well as Computer Science A.

The Programming and Web Development program anticipates serving ~~200~~ 160 students- approximately ~~50~~ 40 students per grade. This corresponds to approximately ~~12%~~ 9.6% of the expected population of 1670 students. Chapter 74 regulations outline a 20:1 student to teacher ratio as a maximum. In the Worcester schools, teachers are assigned five classes each year each with an average of 27 students, with a total student load not to exceed 125 students. With a 20:1 ratio, educators within the Programming and Web Development program will not exceed this maximum student load.

Per Massachusetts DESE Chapter 74 policy, "a program designed to provide students with the requisite experience and training to successfully complete the requirements of a Chapter 74 program as outlined in the curriculum frameworks would include at least 900 hours of program-related instruction for each participating student." Further, this program-related instructional time could be comprised of 'shop' time as well as program-related classroom time, referred to as Related Theory coursework in the Worcester Public Schools. Given Doherty's expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of 'shop' time followed by another period of related theory supporting the curriculum.

As students are engaging in a double-block of vocational and related theory work, Programming and Web Development program will include 4 classroom/laboratory spaces. Each space will include 1:1 desktop computers, as industry-standard software programs supporting this curriculum are not supported on Chromebook devices.

The Programming and Web Development program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Programming 1 and Related Theory 1, and a 10th grade student will enroll in Programming 2 and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 11th grade schedule would appear as follows:

Period 1 - English III
Period 2 - Pre-Calculus
Period 3 - AP US History
Period 4 - Programming and Web Development 3
Period 5 - Prog. and Web Dev. Related Theory 3
Period 6 - World Language
Period 7 - AP Physics 1

The Worcester Public Schools anticipates hiring four new teachers to serve all students within this program. This will correspond to 1 teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. For the 2019-2020 school year, Doherty Memorial High School laid the foundation for this program by offering introductory courses in Information Technology. With the addition of one teacher for 2019-2020 school year, Doherty students can capitalize off their skills and industry knowledge as the program gains momentum.

A team, supported by the Programming and Web Development Advisory Council, will develop the 4-year curriculum. This team will include Doherty Memorial High educators, students, guidance and administrative staff. This curriculum development work will take place during the 2019-2020 school year and will have an expected completion date of May 1, 2020.

As part of this curriculum sequence, students will partner with district Information Technology personnel to gain practical knowledge and skills. The new school design will include space to house computer-support devices, servers, network hubs, and related technological infrastructure. Students within this trade program will learn about the varied hardware and software within, and exterior tools that support the school. District IT personnel will be able to train students as they maintain and service the technological infrastructure. During their academic and vocational coursework, students within the Programing and Web Development course will therefore gain valuable career readiness skills from current professionals.

It is traditionally difficult to use high-school interns due to the commute time for interns to travel to the networking office. By housing the school networking infrastructure at Doherty interns from the vocational program would be able to work with IT during the school day as well as afterschool, thereby receiving real world experience troubleshooting issues as they occur. Students would gain experience in IP addressing, network troubleshooting wireless spectrum analysis, user account maintenance, and more.

The minimum required laboratory space for a class of 20 students is 2200 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students

at the same time. The proposed program will be implemented with four combination laboratory space/classrooms. Given the nature of the curriculum, each laboratory space will require a 1:1 desktop computer to student ratio. In order for students to engage with the curriculum in a range of rigorous and differentiated learning activities, additional space and furniture is needed for students-when not utilizing the computers-to work collaboratively. The desired classroom/laboratory layout would establish the computer stations together, paired with an educator's desk and presentation space, at one end of the classroom. The other end of the room would include desk/table space, supported by technology, presentation space, wall space, etc. where students can work collaboratively on project-based work in variable-sized groups.

To promote professional collaboration and support, the four program classrooms/laboratory spaces should be in proximity with each other. These four classrooms can be supported with a centralized storage room as well as a common educator office and planning space. While these program classrooms, storage and staff spaces should be designed together, there is then no required adjacency to any other program within the school.

The Programming and Web Development program proposal seeks four classrooms and two teacher offices. The teacher offices will be shared spaces between the four program teachers.

Construction Craft Laborer

The Construction Craft Labor pathway provides training for all students in all areas of the construction field, including carpentry and framing, rigging, blueprint reading, and masonry. Students will work with all types of hand tools, power tools to build projects.
The Construction Craft pathway provides hands on training for students in the Construction Industry with opportunities to work in the fields of carpentry, construction, masonry, and tile setting, among others.

Skills training received in this program fits the Construction Industry and Occupations. These occupations (so called 'hard trades') include Apprenticeship trades, high employer need and engagement, strong wages and require little formal education and therefore present low barriers. Workers in these trades are often affiliated with organized labor unions and employer sponsored associations offering apprenticeship opportunities leading to post-secondary education and portable industry credentialing. Additionally, as evidenced by the employer survey conducted for the Central MA Regional Blueprint, entry level laborer is the number one occupation facing significant employee/candidate shortages.

The Construction Craft Laborer program anticipates serving ~~150~~ 120 students-approximately ~~35-40~~ 30 students per grade. This is close to ~~9%~~ 7.2% of the expected population of 1670 students. Chapter 74 regulations outline a 15:1 student to teacher ratio as a maximum. In the Worcester

schools, teachers are assigned five classes each year each with an average of 27 students, with a total student load not to exceed 125 students. With a 15:1 ratio, educators within the Construction Craft Laborer program will not exceed this maximum student load.

The Construction Craft Laborer program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Construction 1 and Related Theory 1, and a 10th grade student will enroll in Construction 2 and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 11th grade schedule would appear as follows:

Period 1 - English III
Period 2 - Pre-Calculus
Period 3 - US History 2
Period 4 - Construction 3
Period 5 - CCL Related Theory 3
Period 6 - World Language
Period 7 - Physics

The Construction Craft Laborer program proposal seeks two classrooms and two teacher offices. The teacher offices will be shared spaces between the four program teachers. In addition, the shop area will enable students to transfer theory to practice within this versatile space.

Per Massachusetts DESE Chapter 74 policy, “a program designed to provide students with the requisite experience and training to successfully complete the requirements of a Chapter 74 program as outlined in the curriculum frameworks would include at least 900 hours of program-related instruction for each participating student.” Further, this program-related instructional time could be comprised of ‘shop’ time as well as program-related classroom time, referred to as Related Theory coursework in the Worcester Public Schools. Given Doherty’s expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of ‘shop’ time followed by another period of related theory supporting the curriculum.

As students are engaging in a double-block of vocational and related theory work, the Construction Craft Laborer program will include four related-theory classroom spaces as well as a common shop space for the practice and development of physical skills.

The Worcester Public Schools anticipates hiring four new teachers to serve all students within this program. This will correspond to one teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. In preparation for the development and expansion of this program, Doherty Memorial High School has begun offering courses that align with some of the vocational standards, especially those within Strand 4 (Employability and Career Readiness Knowledge and Skills) and Strand 5 (Management and Entrepreneurship Knowledge and Skills). For example, the school is now offering College and Career Readiness courses that, in part, enable students to "participate in a variety of experiences that will assist them in the development of personal, academic and career/vocational skills." For the 2019-2020 school year, Doherty Memorial High school hired personnel to offer and expand these elective course offerings to students. This course curriculum will serve as the foundation for students entering the Construction Craft Laborer program.

A team, supported by the Construction Craft Laborer Advisory Council, will develop the 4-year curriculum. This team will include Doherty Memorial High educators, students, guidance and administrative staff. This curriculum development work will take place during the 2019-2020 school year and will have an expected completion date of May 1, 2020.

The minimum required laboratory space for a class of 15 students is 3375 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students at the same time. The proposed program will be implemented with ~~four combination laboratory space/classrooms~~ two shared classroom spaces, two teacher offices, and one large shared laboratory space. Given the nature of the curriculum, each ~~laboratory space would require~~ traditional classroom space~~,~~ would allow~~ing~~ students to engage in group work, perform calculations, learn related theory, etc. This space would also support the student use of available, existing Chromebook technology. The adjacent laboratory space would then enable students to acquire practical skills within the trade. Given the varied range of tools and equipment, along with the varied project, hands-on work expected within the curriculum, the laboratory space will need to be versatile. Laboratory spaces will require shop sinks. During the design phase, adequate ventilation and appropriate safety measures will be provided and accounted for in all necessary spaces.

The Construction Craft Labor is the only program proposed that requires a shop ceiling height greater than a typical classroom. Layout efficiency will be considered when locating this shop within the building.

To promote professional collaboration and support, the ~~four program classroom/laboratory spaces~~ two shared classroom spaces, two teacher offices, and one large shared laboratory space

should be in proximity with each other. Given the numerous and varied consumable materials, tools and equipment needed to effectively implement the curriculum, each laboratory and classroom space needs appropriate storage options. Staff will need a common educator office and planning space. These program classrooms, laboratory spaces, storage and staff spaces should be designed together, and this vocational program should be adjacent to the Engineering Technology vocational program area, as students and staff will be able to utilize both sets of laboratory spaces as appropriate within the curriculum. In addition, the laboratory spaces should have exterior access so that large materials, machines or equipment can be delivered and stored or installed.

There is no redundancy in trade programs within Doherty, i.e. no duplication of equipment, tools, or space. For example, several other vocational schools who implement the Construction Craft Laborer program also implement a range of other construction trades, including carpentry, welding, HVAC etc. For example, Medford Vocational Technical High School currently implements the Construction Craft Laborer vocational program for students. Medford also offers vocational programming in related trades including Carpentry, HVAC, and Metal Fabrication and Joining Technologies. These programs, including their equipment, staff, and space, are able to mutually support each other. Medford, and other similar schools, rather than duplicating the space and equipment needs for Construction Craft Laborer and the other trades, have the option to work collaboratively to share the available resources. For example, when students in the Construction Craft Laborer program focus on the development of their welding skills, they are able to utilize the equipment and laboratory space in the Metal Fabrication and Joining Technologies program.

In contrast, the New England Laborers, in conjunction with the Cranston, RI Public Schools, designed and built the Construction Career Academy. In 2002, this facility opened and implements the RI vocational construction craft curriculum. As a stand-alone facility, with no other related shop spaces offering mutual support, almost 7200 square feet is dedicated to the effective implementation of the curriculum.

With the current and proposed CVTE programs for Doherty Memorial High School, there are no related shop areas that would allow for shared spaces and/or equipment. With Doherty's current and anticipated bell schedule, there would be times throughout the day where multiple Construction Craft Laborer classes are simultaneously being run. Each individual class would be limited to 15 students, but with a total planned enrollment of ~~150~~ 120 students there would likely be multiple needs for the classroom and related shop spaces.

Therefore, Doherty is planning for a shop space larger than the minimum 3375 square feet. The 4 associated related-theory classrooms would have adjacency to this shared shop space. The planned common shop space will encompass approximately 5000 square feet. The perimeter of

this shop will include stations, with each focusing on a different skill set and providing space to utilize the equipment associated with that facet of the trade. As there are no redundant programs elsewhere in Doherty, these stations will be designed and equipped to ensure the needs of all vocational curriculum standards and competencies will be met.

While there are no related areas for the Construction Craft Laborer students to utilize, there would be ample opportunities for other school and community programs to benefit from the skills, equipment, space, and practical experiences of the Construction Craft Laborer program.

Marketing, Management and Finance

We currently offer CTE courses in Marketing and Business Doherty Memorial High School offers full year (1 credit) courses in Marketing I and II, Exploring Business Systems, Introduction to Business Systems and Accounting, all of which are scheduled for a 1-period block. In these courses students gain an overview of business operations and acquire computer application and presentation skills, learn essential communication skills applied to business development, entrepreneurship, management, career development and employability.

We are seeking to expand this CTE pathway to be approved as a Chapter 74 Marketing, Management and Finance CVTE certified program. CVTE programs can have a range of benefits including higher rates of college enrollment, and enhanced career skills and increased earnings as indicated by labor market research. The vision for the new building is to continue to grow these programs in a space with access to technology and hands-on opportunities for students to increase their understanding of the field.

This proposed vocational program provides skills training that fits with the Retail/Hospitality industry, which combined is the region's second largest employment sector (19.5%). Marketing has evolved with the changes that the internet has brought to business. Professionals working in the marketing industry must be well rounded in sales, management, advertising, customer service, cultural diversity, and both qualitative and quantitative analysis. While no nationally-recognized credential is available for these skill sets, students can earn the following industry recognized credentials:

- Occupational Safety and Health Administration (OSHA) – Ten-hour General Industry
- Certification • National Retailers Federation Customer Service Certification

The Marketing, Management and Finance program anticipates serving ~~200~~ 160 students, or ~~50~~ 40 students per grade. This corresponds to approximately ~~12%~~ 9.6% of the expected population of 1670 students. Chapter 74 regulations outline a 20:1 student to teacher ratio as a maximum. In

the Worcester schools, teachers are assigned five classes each year each with an average of 27 students, with a total student load not to exceed 125 students. With a 20:1 ratio, educators within the Marketing, Management and Finance program will not exceed this maximum student case load.

The Marketing, Management and Finance program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Accounting 1 and Related Theory 1, and a 10th grade student will enroll in Marketing and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 10th grade schedule would appear as follows:

Period 1 - English II
Period 2 - Geometry
Period 3 - US History 1
Period 4 - Marketing I
Period 5 - Marketing Related Theory 2
Period 6 - World Language
Period 7 - Chemistry

Per Massachusetts DESE Chapter 74 policy, "a program designed to provide students with the requisite experience and training to successfully complete the requirements of a Chapter 74 program as outlined in the curriculum frameworks would include at least 900 hours of program-related instruction for each participating student." Further, this program-related instructional time could be comprised of 'shop' time as well as program-related classroom time, referred to as Related Theory coursework in the Worcester Public Schools. Given Doherty's expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of 'shop' time followed by another period of related theory supporting the curriculum.

As students are engaging in a double-block of vocational and related theory work, the Marketing, Management and Finance program will include one School Store (which will act as a shop space) and ~~four~~ three classroom/laboratory spaces. Each space will include 1:1 desktop computers, as industry-standard software programs supporting this curriculum are not supported on Chromebook devices. Students will transfer these skills from the classroom to practical settings. The goal within this design process is to develop a School Store that supports students and builds culture, but that also empowers students as the School Store will be managed by

students within this trade. Similarly, as the program curriculum is developed and sequenced, the advisory team will expand the outreach and practical application opportunities for these students further into the school and community. For example, vocational students can oversee some of the logistical operations within the Doherty Cafe.

The Worcester Public Schools anticipates hiring four new teachers to serve all students within this program. This will correspond to one teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. For the 2019-2020 school year, Doherty Memorial High School laid the foundation for this program by offering introductory courses in Accounting and sections of Introduction to Business. With the hire of 1 teacher for this coming school year, Doherty students can capitalize off their skills and industry knowledge as the program gains momentum.

A team, supported by the Marketing, Management and Finance Advisory Council, will develop the 4-year curriculum. This team will include Doherty Memorial High educators, students, guidance and administrative staff. This curriculum development work will take place during the 2019-2020 school year and will have an expected completion date of May 1, 2020.

The minimum required laboratory space for a class of 20 students is 2200 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students at the same time. The proposed program will be implemented with ~~four~~ three combination laboratory space/classrooms and two shared teacher offices. With the inclusion of the school store, students will be able to share the classroom spaces with the store as an extension of their shop space. Given the nature of the curriculum, each laboratory space will require a 1:1 desktop computer to student ratio. In order for students to engage with the curriculum in a range of rigorous and differentiated learning activities, additional space and furniture is needed for students-when not utilizing the computers-to work collaboratively. The desired classroom/laboratory layout would establish the computer stations together, paired with an educator's desk and presentation space, at one end of the classroom. The other end of the room would include desk/table space, supported by technology, presentation space, wall space, etc. where students can work collaboratively on project-based work in variable-sized groups.

To promote professional collaboration and support, the ~~four~~ three program classrooms/laboratory spaces and the School Store should be in proximity with each other. These ~~four~~ three classrooms can be supported with a centralized storage room as well as a common educator office and planning space.

In addition, students will benefit from shared spaces within the Visual Arts department, for example as they design displays within their Marketing classes. The store will provide a space to account for many school needs, and students will be able to coordinate and supply

these needs. For example, the store will provide a venue to offer school-branded merchandise for students, families, and community members. This will provide real-world opportunities to apply their vocational skills as they design the products and related advertising, as well as have opportunities to interact with peers and adults in a professional atmosphere.

In addition, one of the goals of the vocational program is to provide opportunities for students to experience practical applications of the curriculum. This will be accomplished through vocational internships or coops in the community for students in the upper grades, but will include in-school opportunities as well. The Marketing, Management and Finance vocational program should have an adjacency to, or be in proximity with, the proposed school store. Students will be able to manage all aspects of this store, such as budgets and financial transactions, inventory control, marketing and awareness campaigns, personnel tracking, etc. In addition, the new Doherty design includes a cafe, and this provides another school-based, student-centered and led enterprise.

CTE and College/Career Pathway Programming

Television Production

Doherty Memorial High School currently offers a CTE programming pathway in Television Production. Doherty's Television (DTV) program offers students a 2-year sequence of courses. At this time, the DTV studio consists of a repurposed closet and storage room, along with a portion of a subdivided classroom. The current television studio at Doherty High School is approximately 350 square feet of renovated closet and storage space. The space is split into 2 rooms. There is a 225 square foot recording studio with insufficient overhead lighting and a green/blue backdrop unit for chroma-key recording. The second room, approximately 125 square feet, is used for editing. There are currently four desktop computers installed with power director software. The class utilizes 3 small Sony HD video cameras, a 4k Sony video camera, and two DSLR still cameras. All of the computers and cameras were obtained via fundraising, either in school or through community and crowd-funding based platforms. There has not been any funding of this equipment or studio since its last major upgrade in 2010.

The proposed new school facility would include a modernized space for students to engage with the curriculum. A modernized Television Production studio should include a space for film editing, enhancements, and would house computers and other specialized production equipment. Adjacent to this is the film studio. In addition, the space would have desks/chairs/tables for student use as they collaborate, conduct academic discourse, plan their productions and segments, receive journalism and production instruction, and engage in other varied learning activities. Current Massachusetts DESE Chapter 74 guidelines states that a Radio and Television

Broadcasting vocational program would have a minimum space of 2500 square feet, providing 125 square feet of space for each of the 20 students working within the program. While Doherty's Television Production programming pathway is not vocational, these DESE guidelines provide a sound baseline when designing a modernized, industry-standard program. Ideally, this studio would be located adjacent to the media center with green/blue screen capabilities and updated HD or 4K cameras, communication and recording equipment, desktop computer editing software, and the ability to broadcast throughout the school through multiple display areas.

Computer Science

The Massachusetts Curriculum, Frameworks for Digital Literacy and Computer Science state that "digital literacy and computer science knowledge, reasoning, and skills are essential both to prepare students for personal and civic efficacy in the twenty-first century and to prepare and inspire a much larger and more diverse number of students to pursue the innovative and creative careers of the future. The abilities to effectively use and create technology to solve complex problems are the new and essential literacy skills of the twenty-first century" (p.7). These frameworks focus on four key domains: Computing and Society, Digital Tools and Collaboration, Computing Systems, and Computational Thinking. Students gain proficiency by integrating practices necessary to succeed in an ever-increasing technological world.

Doherty Memorial High School offers full year (1 credit) courses. The current 1-credit course offerings include Computer Science I, Computer Science II, and Introduction to Computer Programming and Advanced Placement Computer Science Principles, all of which are scheduled for a 1-period block. All of these Computer Science course offerings are non-CVTE electives. During the 2018-2019 school year, there were three sections of AP Computer Science Principles scheduled, serving a total of 70 students. Doherty will also offer the AP Computer Science A course during the 2019-2020 school year.

The Computer Science department is currently a part of the Mathematics Department. There are two rooms predominantly utilized for computer science courses and while these classrooms are adjacent to each other, they are not in close proximity to the majority of the mathematics classes. Both computer science classrooms have desktop computers, and the number of computers is maximized based on the safe availability of electrical connections. It is necessary to have desktop computers in order to utilize the programming software which cannot be supported on the Chromebooks. There are also a set of tablet-arm chairs available in each classroom, as non-computer science courses also are offered in these spaces due to the current lack of available classroom space for other courses.

Neither computer science classroom is designed to effectively support a 21st century STEM curriculum. The physical layout of these rooms discourages effective grouping practices,

collaborative work, and flexibility. The computers are arranged on the perimeter walls, based on the pre-existing locations of the electrical outlets. Most students are not able to monitor the teacher's work, demonstrations, etc. without being able to face their desk and/or device.

Currently, Computer Science classes are sometimes taught by Mathematics teachers, as these staff members tended to have skill sets and/or licensures in both areas. However, the Mathematics Curriculum Framework (2017), as well as the Digital Literacy and Computer Science Curriculum Framework (2016) are distinct curricula and with the coming inclusion of Computer Science as a graduation requirement, coupled with its growing popularity, DMHS may choose to group the Computer Science teachers into their own department. The Vocational Programming and Web Development program teachers will be organized within the larger CVTE department, and not within the Computer Science and/or Mathematics department(s).

DMHS has a seven-period day, with no rotation or dropped periods. Each classroom is then available for use for seven periods each day. Therefore, there are fourteen instructional periods available in a room outfitted to some degree to support a computer science/programming curriculum.

During the 2018-2019 school year, there were two FTE staff members. Most teachers within the department provided computer-based instruction, though one had a general, non-departmentalized elective course as part of their assignment. In total, these staff provided a combined ten instructional periods of mathematics and general electives. In addition, there were several other non-mathematics classes scheduled into these rooms, due to the available space. For the 2018-2019 school year, these twelve 'computer' rooms had a combined usage rate of 86% (twelve used periods out of fourteen available periods).

With the addition of new staff members to the department this year, and the addition of new courses, there is a lack of available classroom space within the computer science area, requiring classes to be scheduled in available rooms outside of the department area. This poses additional scheduling challenges as certain courses require specific software necessitating the use of desktop computers. As enrollment increases and the department continues to grow with additional staff and course offerings, the school will be challenged to find appropriate classroom space to meet these needs

The vision for the computer science courses in the new building includes additional classrooms with advanced technology to support changes and trends in the growing field of computer science. With the anticipation of computer science becoming a graduation requirement in Massachusetts in the near future, there is a need to include flexibility to add more classes and have additional staff to meet this need. This will require consideration in the planning to meet the

technical and electrical needs to support the expansion of this department and the ability to make changes to meet the advances in this rapidly growing field.

Innovation Pathways Program (IPP)

The Innovation Pathways Program was developed to help expand career field exploration through technical education within the Worcester Public Schools. Students participating in the program will experience an in-depth look at a career field of their interest; work towards industry recognized credentials in that area; engage in college and career planning activities; and gain experience through a summer internship or a capstone project. Worcester Public Schools has worked with many organizations and businesses to develop a program that meets the needs and interests of students as well as future labor market demands. We are proud partners with: MassHire Central Region Workforce Board, One8 Foundation, and the Worcester Regional Chamber of Commerce and Business Partners. The IPP coordinator will need an office space to meet with students in the new school design.
(Appendix C)

Dual Enrollment/Early College

Students who wish to pursue advanced or specialized courses beyond those offered at the school may take courses at area colleges including Assumption College, Becker College, College of the Holy Cross, Quinsigamond Community College, and Worcester State University. With our district's participation in Early College, our students have additional opportunities to take courses through Quinsigamond Community College and Worcester State University both at the college campus locations and at our own school. The Early College/Dual Enrollment Coordinator will require an office space in the new facility. (Appendix D)

Internships/Community Service

During the 2019-20 school year, we have been fortunate to add a full-time internship coordinator to our staff. The addition of this position has allowed us to expand the learning opportunities for students to extend beyond the walls of our school and beyond the school day. This teacher is responsible for developing and monitoring our students who are involved in internship opportunities that vary in nature, throughout our community. Additionally, although many members of our staff help to engage our students in community service projects, the addition of this position allows us to have a central location within which to organize and schedule this type of community involvement while increasing the breadth and depth of our participation. Currently, there is an office space afforded for this purpose in order to meet with students and we envision an office space in the new facility.

Virtual High School (VHS)/Edmentum

Consistent with our school and district's mission statements, the mission of the Virtual High School is to provide students and teachers with collaborative and engaging learning opportunities and the vision is to prepare students to be successful in college, careers and life. Students and teachers at our school participate in the virtual high school program and have been involved in this program for many years. Virtual High School allows our students to participate in courses that we may not offer at our school and/or to take a course online that may not have been able to fit into their schedule. Students who participate in these courses receive support their progress is monitored by our staff. Similarly, our students use the Edmentum online platform to engage in coursework for which they may need to recover credits and/or need additional time for course mastery. Participation in this online learning helps students to achieve academically and contributes to college and career readiness. Currently, the he online learning coordinator has an office space in order to meet with students and will need office space in the new facility in order to be able to continue to offer online options for our students.

M. Description of Core Academic Educational Activities
Table 10

English Language Arts	ELA is a graduate requirement in the Worcester Public Schools and all students in Grades 9-12 take ELA each year. Students will gain mastery of a range of skills and applications so that they can read, comprehend and analyze increasingly rigorous literary texts representing a variety of genres, cultures, and perspectives. They will draft and edit clearly written and logically organized arguments, informative/explanatory, critical, comparative, and analytical essays, and narratives using evidence from texts and for a range of purposes, emphasizing clear, logical writing patterns; word choice; a variety of rhetorical strategies; and use of literary conventions and stylistic devices. Students utilize technology to research, write and publish their work. They participate in large- and small-group collaborative discussions and use the conventions of the English language correctly. Journalism and Creative Writing are offered as elective classes. Academic Literacy is a support class for students who need a double dose of ELA. Students who excel in the subject and have an interest in exploring literature and honing their rhetorical skills are encouraged to participate in AP Language and Composition and /or AP Literature and Composition.

Mathematics	Math is a graduate requirement in the Worcester Public Schools and all students in Grades 9-12 earn four credits in mathematics including Algebra 1, Geometry, and Algebra 2. The mathematics program provides opportunities for all students to interpret and persevere in solving real world, complex mathematical problems using strategic thinking. Students will be effective communicators and collaborators who construct viable arguments and critique the reasoning of others in order to make decisions, draw conclusions and solve problems. The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole- and small-group instruction, collaborative activities, hands-on, project-based lessons, modeling of strategies, integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom space often impacts the ability two fully implement these strategies/activities on a more frequent basis. Technology is integrated into the curriculum and students make use of graphic calculators, and Chromebooks to support individual and collaborative activities. Upper level classes such as Statistics allow students to apply the problem solving skills they have acquired to real-life situations and focus on probability, analyzing numerical data, statistical studies, using recursion in models and decision making, using functions in models and decision making, decision making in finance, and networks and graphs. Courses such as AP Statistics, AP Calculus AB and AP Calculus BC rely incorporate technology such as graphing calculators and challenge students to learn through discovery.

Science	Three credits of Lab Science are a required graduation requirement for all students. Courses provide students with opportunities for in-depth exploration of the standards identified in the Massachusetts Curriculum Frameworks. The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, procedures and experimentation, whole- and small-group discussion, collaborative activities, project-based exploration of topics, laboratory experimentation, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis. Students in lab science classes will conduct lab investigations, collect and analyze data, and explore content information from a variety of texts and media sources. Students who have a deeper interest in exploring specific aspect of science may opt to take Human Anatomy, AP Biology, AP Chemistry, AP Environmental Science and/or AP Physics. Science courses utilize dedicated laboratory space, flexible seating/grouping, as well as collaborative laboratory activities, small- and large-group class discussion and modeling of procedures, and results. Teachers incorporate technology into their classes as students use computers for research, collaboration and sharing.

Social Studies	Three credits in Social Studies (World History II, United States History I and II) are required for graduation. The Social Studied department has high expectations that all students will understand the political, social, economic, historical and legal developments throughout human history by guiding them to be critical thinkers, analytical readers, thoughtful communicators and independent learners. Educational activities implemented in the department include but are not limited to the use of differentiated instructional, whole-and small-group -instruction, modeling of strategies, whole- and small-group discussion including Socratic Seminars and debates, collaborative activities, project-based learning activities, and the integration of technology to support research skills, analysis of historical perspectives and cause and effect. These skills build upon critical reading (texts and primary and secondary source documents, charts, maps, and visuals) and thinking skills. Students are asked to analyze documents in order to prove their thesis in Document Based Questions (DBQ). Cross-disciplinary collaboration between Social Studies and English departments support the use of these skills. Students may choose to take one of the social studies electives: Legal Aspects, Psychology, and Sociology. Advanced Placement courses engage students in advanced-level course work. Students may elect to take AP World History, AP US History, AP Human Geography, AP Government and Politics, and AP Psychology. These classes build upon the skills presented in earlier courses and add to the levels of discourse, reading and writing.
World Language	The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners and to support the use of the target language. Instructional methods include whole-and small-group -instruction, modeling of strategies and oral and written use of the target language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to research the culture and history of the countries associated with the target language and to practice speaking and listening skills using Audacity, a multi-track audio editor and recorder.

English Language Learners	The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners as they develop English fluency. Instructional methods include whole-and small-group -instruction, modeling of and oral and written use of the English language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills While this is the goal in all classes in the ELL department, limited classroom space often impacts the ability two fully implement these strategies/activities on a more frequent basis. EL Students access the curriculum in content area classes taught by teachers Sheltered English Immersion certification who use a range of strategies to support EL students in content area classes .Students also participate in Language and/or Literature Labs A, B, C, or D taught by certified EL teachers who employ instructional strategies to support and increase student abilities in the four domains: speaking, listening, reading, and writing.

Special Education	Special Education students are engaged core academic curriculum and are assigned a faculty advocate and scheduled into the appropriate classes as indicated in their IEP. The curriculum is delivered using varied, individualized and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, use of both oral and written use of language, use of manipulatives and other hands-on learning tools, whole- and small-group discussion such as modeling read-aloud and think-aloud skills, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills. Inclusion students receive support from a certified Inclusion teacher in their general education classes. Study Skills class supports students in the use of individualized and differentiated strategies to support their ability to access content area curriculum. Students in the STEP classes engage in small group and individualized instruction using a variety of individualized and differentiated strategies in accordance with their IEPs. Technology is integrated into lessons and classroom activities are guided by the district's High Quality Reading Writing, and Discourse document. Resource classrooms use individualized and differentiated strategies along with scaffolded instruction to support students' ability to access the curriculum that meets their needs as identified in their IEP. Life Skills students work with dedicated and certified Life Skills teachers practicing the four domains of language acquisition: speaking, listening, reading and writing as well as in problem solving and numerical skills.

Coordinated Program Review

The last Coordinated Program Review for the Worcester Public School was on September 9, 2016, September 28, 2016 and October 21, 2016 (see Appendix E).

Core Academic Educational Activities/Outdoor Connections

Doherty Memorial High School utilizes all of its space, both inside the building and outside the building to support learning opportunities for all students. Some of the student-centered clubs and activities utilize outdoor space throughout the year to engage students and help them to form life-long connections with outdoor activities and interactions with nature. Doherty's Outdoor Club engages students in a variety of activities such as hiking, camping, and snowshoeing. The Envirothon Team is a hands-on environmental problem-solving competition for high school-aged students. Students in this group complete training and testing in five natural resource categories: i.e., soils/land use, aquatic ecology, forestry, wildlife, and current environmental issues. Students are involved in our school/community garden. In past years, vegetables grown in the garden have been shared with community members and with our own food service program.

The vision for the new school is to increase the use of outside space to support both curricular and extracurricular activities. During the visioning sessions involving members of the school and community, several members discussed the importance of students having access to outdoor spaces, including the opportunity to engage in classwork or learning activities outside. This could include having the science classes come out to the field to measure biodiversity, art students finding inspiration or capturing scenes from the community, theatrical productions or open-air stages affording differing venues for productions, and provide opportunities for other classes, groups, clubs, athletic teams, and community organizations to occupy this versatile space. Currently, we have a very active outdoor club and our Envirothon team is award winning and would benefit from and help to maintain this space along with those students who are active in community service.

Students in the Life Skills class will have access to outdoor space through a grade level entry. This will prove access to the garden which can be used as a teaching tool to support skills learned through the ADL Center. Other classes, such as science classes can also benefit from access to the garden as will classes in the Visual Arts department.

To support this need, the design of the new Doherty Memorial High School will include an exterior amphitheater style space, including a flat stage or production area. This exterior space will be supported by audio/visual technologies, including a large exterior projection screen, and the capacity to connect with microphones/speakers. A mobile projection cart can be brought to the space to support the needs of these varied organizations. The use of this projector/outdoor screen would be incorporated into all types of educational programming including core academic learning activities, student performances, and project presentations such as the ETA Learning Fairs, athletics, community building activities, and community use. Outdoor space with tables and seating would allow classes and clubs to access the grounds and to meet outside.

A Typical Day in the Life of a Student

Table 11

Activity or Subject	**Program Details and Educational Benefit*** Refer to descriptions of core academic educational activities
Free Breakfast	All students are eligible to participate in the breakfast program at school at no cost to the students or their families.
Period 1	Core Academic or Elective Class
Period 2	Core Academic or Elective Class
Period 3	Core Academic or Elective Class
Period 4	Core Academic or Elective Class
Lunch	All students are eligible to participate in the lunch program at school at no cost to the students or their families.
Period 5	Core Academic or Elective Class
Period 6	Core Academic or Elective Class
Period 7	Core Academic or Elective Class
After-School	Students may participate in extra help /tutoring sessions, clubs, activities and/ or sports

Clubs and Activities

Doherty Memorial High School offers a range of clubs and activities to support student interests. Clubs are student-driven and are supported by volunteer faculty advisors. Clubs meet after school in different areas of the school. Depending upon the specific activity.

The vision for the new school includes space for student clubs to meet after-school in safe, supervised areas of the building. Since most of these activities occur after the school day designated meeting areas which would allow for supervision, access to restrooms, phones and technology would benefit these activities and help to support student involvement in their school. Students should be able to exit the building easily after participation in a club without having to walk through the entire building to reach the exit.

Some clubs and activities occur later in the day or early evening at the school indicating a need for meeting space close to the main entrance of the building. Storage space for club materials would benefit the groups as would a dedicated area to promote/advertise upcoming meetings and events. A calendar board or interactive screens dedicated to clubs and activities displayed in prominent spaces throughout the building (main foyer, cafeteria, media center, gym, and academic neighborhoods/academies).

Some of the student-centered clubs have included the outdoor club and the community garden. Outdoor space with tables and seating would allow clubs to access the grounds and to meet outside.

Clubs and Activities

Table 12

Anime Club	Highlanders Who Code	Stand for the Silent
Book Club	Humanities Scholars Collaborative	Student Council
Chorus*	Jazz Band*	Student Wellness Club
Class Officers	Madrigals*	Student Workroom
College Success Institute	Math Team	Superintendent's Student Advisory
Community Service	Meditation Club	Theater Club
Cultural Dance	Mock Trial Team	UNICEF Club
DTV*	Model UN	United Nations Club
Envirothon	Musical	Vex Robotics
First Knights Chess Club	National Honor Society	Weightlifting Club
Food Drive	Outdoor Club	Yearbook*
Gamers Club	PEACH Club	Yoga Club

Gay/Straight Alliance	Peer Tutors	Zumba Club
Girls Inc. Leadership Academy	Ski/Snowboard Club	*taken as a class

A Typical Week in the Life of a Student

Doherty Memorial High School operates on a seven-period day schedule with no variations. Every class meets every day.

Advanced Placement Course Enrollment Doherty Memorial High School

Table 13

	2015	2016	2017	2018	2019	2020 (Approximate)
Total # AP Students	299	286	337	432	468	unknown
Number of Exams Administered	554	482	561	722	805	741
Number of Courses Offered	18	18	20	20	20	22

Table 14

Student Enrollment Per AP Course						
	2015	2016	2017	2018	2019	2020
Art History (District-Wide)	1	2	5	2	3	1
Biology	82	52	70	105	74	47
Calculus AB	19	25	27	25	21	13
Calculus BC	14	12	10	27	31	24
Chemistry	17	22	17	32	Course not offered	8
Chinese	Course not offered	Course not offered	2	Course not offered	Course not offered	Course not offered
Computer Science A	2	4	9	6	Course not offered	5
Computer Science Principles					70	76
English Language and Composition	66	65	44	76	45	75

English Literature and Composition	64	60	23	40	32	33
Environmental Science	50	14	16	14	54	102
Human Geography	Course not offered	Course not offered	44	83	98	71
Physics 1	37	16	40	45	74	46
Physics 2	37	16	39	45	74	Course not offered
Psychology	55	61	50	57	67	61
Research	Course not offered	Course not offered	Course not offered	Course not offered	14	1
Seminar	Course not offered	Course not offered	Course not offered	22	16	6
Spanish Language and Culture	18	16	14	12	16	18
Statistics	25	53	33	31	29	38
Studio Art: Drawing Portfolio	15	10	20	19	20	25
United States Government and Politics	18	12	19	26	23	16

United States History	23	26	66	42	43	23
World History	11	15	11	13	12	13
Economics	Course not offered	Course not offered	Course not offered	Course not offered	Course not offered	49

N. Transportation Policies

The Worcester Public Schools offers transportation (bus) services to eligible students. Based on geographical and population distributions, Worcester is broken into quadrants. Students, based on their address, are assigned to a comprehensive 'home' school. Students who live 2.0 or more miles away from their assigned home school are provided, without a fee, bus services. Students under the 2.0-mile limit are responsible for getting to and from school.

Students seeking to attend a comprehensive school other than their home school are able to apply for special permission. If granted this permission, students are required to provide their own transportation, even if their address is more than 2.0 miles from the school.

All students with a driver's license are currently able to receive a parking sticker, without a fee, and park on campus. All parking lots are at, or over, capacity and therefore are available on a first-come, first-served policy. The number of students requesting parking stickers is steadily increasing, and in the near future the school administration will likely consider identifying and implementing selection criteria to better manage the limited parking spaces.

Doherty currently has one vocational program, and all eighth-grade students across all Worcester districts are eligible to apply for admission to this program. With the MSBA proposal, Doherty is working to add three additional trade programs. If successful, all Worcester students will again be eligible to apply for admission. Any student enrolled in a vocational program is provided bus transportation for as long as they remain in the program, and as long as they live 2.0 or more miles from the school. This policy extends to students from across the district.

With our current academic programming, including one vocational program serving students from across the district, and based on fairly steady population density and housing rates, the school has required nine large buses and five small buses to service the transportation needs of the students. This has remained steady for the past three years, and increased from eight and four

respectively. These figures will certainly increase as new vocational programs, as well as the advanced academy, become available. Similarly, the location of a potential new school would have ramifications for the transportation needs of the students.

Per their IEP or 504 plan, eligible students are also provided transportation services. Based on the individual needs and circumstances, these students are provided door-to-door transportation via small bus routes.

In total, 681 students were provided transportation services during the 2018-2019 school year.

At this time, there are no planned changes to the Worcester Public Schools' transportation policies. However, the school's final location and educational programming decisions may/will impact the transportation needs of the students in attendance.

O. Functional/Spatial Relationships

There are several functional and spatial relationships and adjacencies that we envision as important to the design and program development for the new/renovated Doherty Memorial High School. We have highlighted some of the priority areas below.

- The ninth-grade academies to be located adjacent to one another in a "neighborhood" in order to provide the necessary additional support to these students as they transition to high school. Each academy and team of teachers associated with the academy will have a common space to support increased collaboration, project-based learning, and interactive learning experiences.

- The Medical Suite to be located near the Principal's office in order to be able to support the nurses when needed.

- The English Language Arts and Social Studies department areas, serving students in grades 10-12, to be adjacent and share a common area, "neighborhood", in order to foster interdisciplinary connections in the humanities.

- The Mathematics and Science, Technology and Engineering department areas serving students in grades 10-12, to be adjacent and share a common area, "neighborhood", in order to foster interdisciplinary connections in STEM/STEAM.

- The Performing and Visual Art areas, “neighborhood”, to be close in proximity to support the comprehensive Art program and to foster collaboration and be equally accessible to all students and staff.

- The gymnasium, the auditorium, and the cafeteria to be used not only by all students and staff, but also to be a community space for use after school hours that can be secured from the academic areas of the building.

- Special education classrooms/learning centers to be distributed and integrated throughout our fully handicapped accessible, ADA compliant, new/renovated facility.

- The Media Center, with the desired Maker Space, to be centrally located ensuring equitable access to all students and staff.

Building Systems

The design and construction of the new Doherty Memorial High School will include and reflect modern technologies, energy efficiencies, sustainable practices, and supportive infrastructure.

The mechanical system design for the school will reflect the needs identified above. The facility will be fully air-conditioned. Using gas as a primary energy source, the school will be supported by high-efficiency Lochinvar gas boilers. The boiler will be centrally located and include overhead, garage door style access. The school will include full mechanical system controls with easy to access systems. The roof will be accessible through a walkout access door, not a ladder.

The school’s plumbing needs will reflect current best practices. Students, staff and visitors will have access to gender neutral bathrooms utilizing low water urinals. The kitchen will have grease traps with easy cleanout capacity, and the facility will have oil separator traps with easy cleanout access.

Students, staff and visitors will have access to restroom facilities. Throughout the building and into key community spaces, the design will include numerous gender-neutral restroom facilities to support the needs of all in the building, as well as sets of male/female restrooms. In key spaces, the facility will provide personal shower capacity.

Doherty Memorial High School, seeking to implement sustainable and environmentally friendly practices, will install water stations throughout the building. These will allow for direct water access as well as a faucet for students, staff, and visitors to refill water bottles as needed.

To support an efficient facility, the electrical system will incorporate smart technologies and energy efficient options. The school will have fully controllable LED lighting. Staff will be able to raise and lower the auditorium lighting, e.g. light bars, thereby removing the need for a lift to replace bulbs. A generator providing back-up power will be stored on site.

P. Security and Visual Access

Security and visual access requirements are currently implemented at Doherty Memorial High School. There are approximately 55 working cameras that are strategically placed throughout the school building, an increase from 20 cameras from the 2017-2018 school year. The cameras are located in hallways, the cafeteria, several sections around the parking lot, and several of the school's many entrance/exit doorways. The cameras are monitored in two administrative offices. There is a camera and electronic unlocking system, which includes a microphone and speaker feature, at the main entry door to the building. The main office staff has access to this camera and can provide access to visitors and students. Despite the number of functional cameras, there are numerous sections of the building for which there is no security coverage. The current layout of the building includes many 90-degree turns and mid-corridor doorways that limit visual access.

The WPS has standardized district-wide on the use of Genetec for video surveillance as well as AXIS brand surveillance cameras. The district will provide proprietary specifications information for these products in the Schematic Design submission. This standardization allows the WPS to reduce on-going training for staff and lower maintenance costs and maintenance timeframes for hardware.

The design for the new building includes plans that all interior circulation and major spaces will have camera surveillance, as well as the outside perimeter around the school and in the parking lot, thereby providing full saturation of the campus. With the increased size of the new building, its expected student and staff utilization during non-school hours, and its increased public access and use, there will be the need for thorough state-of-the-art camera and security systems to cover all areas of the building and campus. Video surveillance cameras will be a combination of fixed view, panoramic and pan-tilt-zoom (PTZ). Camera location and required view will dictate the camera type. A conduit to be provided for cameras around athletic fields and locations not directly attached to the main structure such as parking garage/overhang.

The physical layout of the building design should eliminate blind spots under stairwells, so a dedicated camera is not required. Infrastructure for cameras at all locations should be provided, even if the funding is not in place immediately. Monitoring stations will be provided for the main office, SRO office, principal office and assistant principal offices.

The main office and principal's office will have a large format display connected to the surveillance system for monitoring of multiple camera feeds at once. Remote access to the camera feeds may be granted via the main Genetec system. The intent is to provide login access for Police Department to access the security system, per the existing Memorandum of Understanding (MOU). Data storage will be required for all camera footage capable of storing a minimum of 33 days of video. Server hardware will be required to process the archiving of all camera footage to data storage.

The access point to the school will be separated by an entrance corridor to the main office and will be monitored and controlled by personnel in the main office. This main building entrance will be adjacent to the main office and within a line of sight to the office. Access through these doors will be controlled via a video intercom/intelligent door controller connected to the district's main access control system and will be controlled via main office staff. Entry will be allowed to the school through exterior and interior vestibule doors at the start of the school day. After the start of school, the interior vestibule doors will be locked.

A door from the vestibule will provide direct access to the main office through the use of a video intercom and an intelligent door control unit that is tied into the district's main access control system and is controlled by the main office staff. All visitors, during and after school, must go through the main office to access the school. After school, access to the building will also be through the main office.

All exterior doors, along with portions of Information Technology spaces, will utilize an electronic card access. The IT spaces housing the Main and Intermediate Distribution Frames (MDF and IDF respectively), the storage space, as well as the Support Specialist Office/Meeting spaces will be accessible via an electronic card access.

Across the district, the Worcester Public Schools is standardizing on the utilization of access cards, as opposed to key fobs, to leverage existing ID and timecard printing standards being used district-wide. If a card is lost the access rights to that card can be terminated. All exterior entrances will have a card reader to allow and log access. Critical facility locations (such as data closets and server room) will have a card reader to allow and log access. An added benefit to the ID access card protocol is that card reader access will be controlled centrally based on schedule or cardholder permissions.

Effective P.A. and phone communication systems is vital between all classes, laboratories, shops, and community spaces. This will be accomplished with a telephone/intercom system that allows direct calls to be made from one school space to another. In addition, the laboratory/shop spaces will include a visual cue when an incoming call is made. Often the noise levels in these

spaces can prevent the staff member from hearing the intercom or call: a visual, such as a flashing light, in addition to the ring will ensure that all rooms can be contacted.

All classrooms and general spaces will include digital clock displays. These will have the capability of broadcasting messages, for example an emergency notification, when needed.

All communications (including bell system which is tied into phone) will be on emergency power generators. All phones in classrooms will have capabilities (with access code) to call out and to page. The Worcester Public Schools' standard is the Shoretel/Mitel voice-over-ip phone system and phones. The district will provide proprietary specifications information for these products in the Schematic Design submission. In addition, each classroom to have two emergency call switches, which opens a direct speaker from classroom to office.

Per existing code, a repeater system/signal booster will be provided for police and fire communications. Both Worcester Police and Fire Departments are recommended to use the same frequency for this DAS "repeater" system.

The design of the new school allows for vehicular access around the full perimeter of the building. Bollards, planters or a more welcoming design feature that provides similar security protections are desired at the front entry. To discourage after-hours access to the athletic fields by vehicles, the design calls for the potential use of bollards, gates or similar features will be used as deterrents.

The Worcester Fire department prefers that no key is required to access the grounds.

Appropriate representatives from various first responding emergency agencies, e.g. Worcester Fire, Worcester Police, and Worcester Emergency Management personnel, will be consulted in the planning process and associated requirements will be incorporated into the preferred solution.

Principals update and review the emergency response plan every year and train all faculty members. A minimum of two times a year, Doherty Memorial High School faculty and students participate in a mock light lock down and a full lock down. All district schools have adopted and implement the ALICE Model (Alert, Lockdown, Inform, Counter, and Evacuate) when responding to a crisis. Additionally, all administrators have In Force 911 installed on their cell phones which provides a means to contact all emergency personnel in the city within seconds should an emergency situation warranting that action were to occur. Principals and the school-based emergency team lead the faculty in practicing a medical emergency drill. Doherty High participated in their last Medical Emergency Drill on August 26, 2019.

Beginning in the 2015-16 school year, a School Resource Officer (SRO) was assigned to the building to support a safe and secure school environment. Doherty Memorial High School has one School Resource Officer (SRO) who is employed by the Worcester Police Department, as a police officer and is trained in the national SRO model of teacher/mentor/law enforcement triangle. The SRO requires a private office within the school to conduct mediations or meetings with parents, the SRO may also use a conference room when necessary. The goal of the SRO is to establish positive relationships with students and faculty, to monitor and deter altercations in the cafeteria and hallways, and as a last resort to engage in an incident. The SRO works closely with school administrators and utilizes a community policing method to build positive relationships with students. However, the staff and teachers at Doherty High have the primary responsibility to intervene during in-school disputes.

The SRO currently has an office near the first-floor assistant principals' offices.

Our vision for the new school is to place the SRO's office on the first floor adjacent to the principal's office. The office needs to provide space for the officer to meet in private, with administrators, students, and families. The office will need access to technology as well as a separate and secure phone line.

Audio/Visual

Doherty currently has a variety of audio/visual and projection equipment throughout the building. Over the years, several classroom spaces have been outfitted with wall or ceiling mounted projectors. The school has acquired approximately 24 carts outfitted with a projector and a document camera. These carts are shared between all staff throughout each day.

The communal spaces, including the library, cafeteria, auditorium, and gymnasium have no wired infrastructure to support audio capabilities, such as speakers or microphones. Instead, the school has a portable unit that is brought to the location. Power, microphone and speaker cords are run along the floor and/or wall and typically are taped down or covered with a carpet swatch for safety purposes. The speakers and amplifier set-up are not fully compatible with the physical layout of the varied spaces; therefore, the audio technology's efficacy is limited.

The goal within a new facility is to provide effective, up-to-date technological access for all stakeholders - students, staff, district personnel, and community members - within all rooms and spaces in the school. Classroom spaces would include Epson bright link short-throw projectors, document cameras wired for use, Chromecast/Apple TV capacity, speech reinforcement technologies, and flat-screen televisions or monitors available for varied (independent or mirrored) displays in and around classrooms. Communal spaces, including the cafeteria, auditorium, library, common or meeting rooms, would have similar projection capacity, and the

larger presentation spaces will provide audio technologies, including speakers, podiums, microphones, etc.

Like any facility utilizing technology, the school will require space to store equipment along with a space to maintain or repair damaged devices. The proposed design includes an Information Technology Office serving many purposes: students will learn alongside district IT personnel as the professionals service the school network; the IT professionals have a dedicated workspace that enables collaboration; a computer network storage room; as well as a storage and maintenance space. The proposal is to utilize the IT storage and maintenance space in a dual capacity - serving the IT as well as the audio/visual needs of the school.

Conclusion

It is our hope that throughout this document we have been able to capture and communicate to you, the commitment, collaboration, community, culture and climate of our school and that you will support our desire to establish a new and more suitable home for the Doherty family and for our surrounding community. We are grateful to the MSBA to have been given this opportunity. As Jim Rohn states, “Whatever good things we build end up building us” and it is our hope that the new building will support the programs we will offer and help us to prepare our students to be capable and contributing members of our community, both locally and globally.

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APPENDIX

Appendix A: Refer to Section 3.1.2.D.4

Appendix B

Early College High School Program **Quick Reference Information Sheet**

Program Description

The Early College program is a secondary/post-secondary partnership involving Worcester State University, Quinsigamond Community College and Worcester Public Schools.

This collaborative program enables high school students to participate in college/career readiness activities, in addition to taking academic and career credit course offerings at their high school or one of the college campuses. Students earn at least 3 college and high school credits simultaneously and graduate from high school with a high school diploma with up to 12 college credits.

The goal of the program is not only to increase the percentage of college ready high school graduates, but also to provide students with a "head start" on earning a two to four year college degree. The collaborative program ensures that students receive support in both academics and advising in addition to wraparound services to promote success and completion. Family engagement activities will also be a component of the Early College Program.

Program Requirements

High School students follow the traditional 9th and 10th grade course schedule and begin to explore career pathways by participating in the following:

- Introduction to College and Career Readiness Course (9th grade)
- College and Career Readiness I Course (10th grade)

Beginning in the 11th grade, students choose a pathway. In addition, students participate in the following:

- College and Career Readiness II Course
- 1-2 college courses at their high school or on one of the college campuses

In 12th grade students fulfill high school requirements through the completion of both high school and college courses. Upon graduation students transfer 12 college credits to their college of choice and continue their study to complete an associate or bachelor's degree program.

Program Participation/Commitment

Program participation is open to any student enrolled in a WPS high school. Students commit to complete a minimum of 12 college credits prior to completing high school.

Pathway Offerings

- Healthcare – Nurse Education
- Advanced Manufacturing
- Computer & Information Technology
- Engineering & Biotechnology
- Elementary Education Transfer Option
- Hospitality and Recreation Management
- 100 Males to College
- General Studies

Program Capacity

Year 1 – 120 students participate in dual enrollment
Year 2 – 240 students participate in dual enrollment
Year 3 – 300 students participate in dual enrollment

Application Process

Students complete an Early College Program application in their 9th grade. If the number of applicants exceeds the number of seats available, selection will be made by lottery.

Worcester Public Schools
October 5, 2018

Appendix C

Worcester Public Schools **Innovation Pathways Quick Reference Sheet**

Empowering students with a career vision and the skills to pursue it with confidence

Program Description

The Innovation Pathways Program was developed to help expand career field exploration through technical education within the Worcester Public Schools. Students participating in the program will experience an in-depth look at a career field of their interest; work towards industry recognized credentials in that area; engage in college and career planning activities; and gain experience through a summer internship or a capstone project. Worcester Public Schools has worked with many organizations and businesses to develop a program that meets the needs and interests of students as well as future labor market demands. We are proud partners with:

- MassHire Central Region Workforce Board
- One8 Foundation
- Worcester Regional Chamber of Commerce and Business Partners

Program Requirements

- College and Career Readiness I and II – classes taken at home high school
  - provides student support, college and career planning, industry connections, technology knowledge and skills, management and entrepreneurship, employability skills, and financial skills
- 2 Technical Classes from Program List below
  - November 5 through Mid-March
  - 2-3 days a week (depending on program) from 2:30 – 5:30 at Worcester Technical HS
  - Bussing to WTHS provided. WRTA passes or guardian pickup for trip home
  - Snow days are made up the week following the missed class
  - Students receive WPS credit on their transcript for the classes
- 100-hour Paid Internship or Capstone
  - After successful completion of both technical courses
  - Internships will be targeted for summer months based on industry availability
  - Students receive WPS credit on their transcript
- 2 Courses that qualify as College Level
  - AP or Dual Enrollment classes

Program Participation/Commitment

Program participation is open to any student enrolled in a WPS comprehensive high school. Preference will be given to 9th graders during the application period. After acceptance, students will complete one technical class each of the following two years and then a summer internship or capstone.

Created: October 5, 2018 **Page 1 of 2**

Appendix D Family and Community Guide

https://worcesterschools.org/wp-content/uploads/2018/07/wps_family-guide-and-community_resources.pdf

Appendix E Coordinated Program Review

Quinn, Eileen

From:	Szymczak, Jayme <jszymczak@doe.mass.edu>
Sent:	Wednesday, November 02, 2016 2:50 PM
To:	Binienda, Maureen
Cc:	Seale, Kay C.; Quinn, Eileen; Rodrigues, Marco; Paulin, Amy (DOE); PQA-CAP
Subject:	Subject: Department of Elementary and Secondary Education Review of Worcester Public School District's Coordinated Program Review Corrective Action Plan Civil Rights Progress Reports
Importance:	High

Dear Superintendent Binienda:

Thank you for your district's recently submitted Coordinated Program Review Corrective Action Plan special education progress reports, which the Department has now reviewed.

After reviewing your progress reports, we are pleased to inform you that no further progress reports are now required. **You can access the Department's review and the Progress Report forms directly by going into WBMS and clicking on the area on the menu bar entitled "CAP/Progress Reports."**

Please contact Jayme Szymczak at 781-338-3738 if further clarification is needed on any matters presented here.

Sincerely,

Jayme Szymczak, Follow-up Liaison
Office of Public School Monitoring
Massachusetts Department of Elementary and Secondary Education
75 Pleasant Street
Malden, MA 02148
jszymczak@doe.mass.edu

Amy Paulin, Supervisor
Office of Public School Monitoring
Massachusetts Department of Elementary and Secondary Education
75 Pleasant Street
Malden, MA 02148
apaulin@doe.mass.edu

1

Additionally, Refer to section 3.1.2.D.9 & 10

Appendix F: Refer to 3.1.2.C Chapter 74 Program

Chapter 74 Programming Submission

Appendix G: Refer to 3.1.2.D.11

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DOHERTY MEMORIAL HIGH SCHOOL
Worcester Public Schools
EDUCATIONAL PROGRAM

Feasibility Study for submission to the Massachusetts School Building Authority
September 2019

PSR Update with Designer Responses: December 2019

Table of Contents

Introduction

Doherty Memorial High School (DMHS) is a community of learners committed to working together to develop the mindset and the skills necessary for all students to become college and career ready, and lifelong learners. The school empowers students to become critical and independent thinkers while fostering creativity and a growth mindset that supports the belief that all students can succeed. Doherty Memorial High School engages families, students, staff, and community members to work collaboratively to ensure the success of all members of the Doherty school community.

The students, staff and family have a sense of pride in the school as is evidenced by the enthusiastic and continued support of its academic and extracurricular activities. In the 2011 Decennial Report, the New England Association of Schools and Colleges (NEASC) noted in its accreditation report that the students have a sense of pride in their school. They are happy to be there each day and they feel safe and secure. This school pride can be seen as they cheer for each other on the playing field, on the stage, in their classrooms, and in our community. *Doherty Pride* is more than just a slogan at the school, it is something than can be witnessed in the care they show for each other, stepping up to assist a classmate in need or organizing a school-wide rally for Stand for the Silent, or the care they take in making the aging facility a home as they use their artistic talents to paint murals on the walls or decorate a classroom.

Doherty Pride is visible among the staff as well. Currently, 30 staff members are Doherty alumni, fifteen have had their children or relatives attend the school, and six currently have students attending or will attend the school next year. This adds to the sense of community that is present in the school and demonstrates a level of commitment to the core values that guide the work and support our students. As we began this phase of our journey towards planning a new building, faculty members were asked to share their opinions and their hopes for our students in a new building. A survey was distributed to the faculty had an 85% return/participation rate and yielded valuable information to guide us in the writing of this report. Many shared their excitement for being able to provide a more modern facility with state-of-the art technology to prepare our students to succeed in the twenty-first century. Teachers shared their ideas and their hopes for the school and for our students at faculty meetings, on surveys and many volunteered their time after school and during the summer to participate in the visioning process. This is just one way that they demonstrate their commitment to our students and their pride in our school and its programs.

The school is an integral part of the neighborhood and has long been supported by the community. Students are actively involved in our local community and partner with local agencies and business through internship programs. Each year over 70 local community members volunteer their time as Career Day speakers and share their career paths with our students. As a result, many speakers have opened their businesses to our student interns and volunteer to come back each year to work with our students as speakers, as AVID tutors, and as supporters of our performing arts and sports programs.

Doherty Memorial High School is located at 299 Highland Street, Worcester, MA and in the 2018-19 school year, DMHS had 1,529 students in grades nine through twelve. Opening its doors in fall 1966, the school was originally built to house students in grades ten through twelve. The school population increased with the inclusion of Grade 9 in 1983 and its student enrollment has been growing steadily since then.

Located on the west side of the city, the student body represents a cross-section of the local community. The school offers a range of academic and extra-curricular programs to serve its body of diverse student learners.

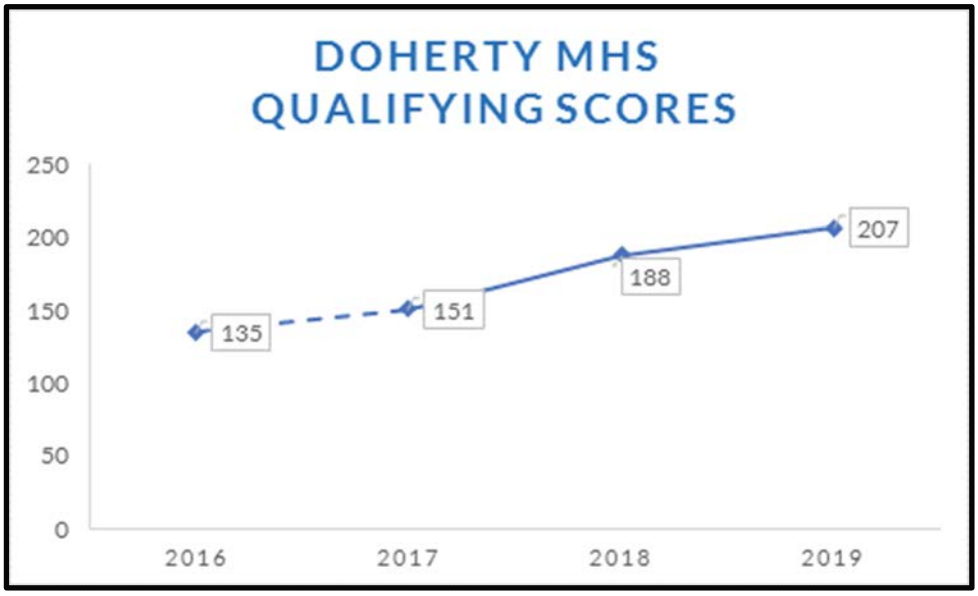
Table 1

Year: (As of October 1st each year)	Students	Female	Male	Asian	African American	Hispanic	Native American	White	Low Income	English Language Learners	Special Ed
2018-19	1529	708	816	115	298	469	16	627	763	285	230
2017-18	1544	709	835	141	292	635	16	460	724	300	252
2016-17	1553	708	845	147	284	485	14	623	729	354	257
2015-16	1467	686	781	157	246	443	15	606	591	259	218
2014-15	1428	689	739	159	244	421	17	587	835	279	214

Academic success and college and career readiness are the cornerstones on which Doherty Memorial High School's foundation of learning is built. The breadth of course offerings and the rigor of course content prepares students for post-secondary success. The school offers a range of courses to meet both student needs and student interest including 22 Advanced Placement courses in the humanities, and math and sciences, an Engineering and Technology Academy (ETA), visual and performing arts, world languages, Career Pathways program, as well as college and career preparatory courses at multiple levels. The curriculum is purposefully designed and adheres to the Worcester Public Schools (WPS) curriculum which aligns with the Massachusetts Department of Elementary and Secondary Education's Mass Core curriculum frameworks.

Students challenge themselves through participation in a variety of courses at every level. Students who participate in the Advanced Placement courses challenge themselves to engage in advanced-level course work and earn college credit based on qualifying scores on the AP exams. In 2019, students in AP courses at Doherty Memorial High School achieved 207 qualifying scores an increase from 151 qualifying scores prior to 2017.

Figure 1



(Mass. Insight Education & Research)

Other students challenge themselves by participating in Early College High School classes. Beginning in 2019-20, Doherty Memorial High School will be able to expand this opportunity by offering college courses on the Doherty campus, in partnership with Worcester State University and Quinsigamond Community College.

Course work at all-levels challenges students to engage in higher-order thinking and to apply these skills to authentic learning opportunities. The collaborative skills supported through these courses provide valuable tools for our students as they prepare to engage in a global economy and the world around them. Students apply these transferable skills to not only their class work but to opportunities that arise in the community through partnership and internship opportunities.

Doherty Memorial High School has a long tradition of academic excellence and many of its graduates go on to pursue their post-secondary education at a variety of colleges and universities located across the nation. Others further their education through training programs and enter the workforce or the military. Members of the class of 2019 were accepted to 188 different colleges and universities including: Assumption College, Becker College, Boston University, Brandeis University, Brown University, Clark University, College of the Holy Cross, George Washington University, Harvard University, Massachusetts College of Art and Design, Massachusetts College of Pharmacy, Morehouse College, Quinsigamond Community College, University of Oregon, University of San Diego, University of Massachusetts, Worcester Polytechnic Institute, and Worcester State University. The school profile for the class of 2018, with 376 members, shows that 87.4% of the students went onto some type of postsecondary schooling. More specifically, 54% to four-year college, 33% to two-year college, 0.4% to postsecondary and trade school, 8% to work, 2.4 % to the military, and 0.2% to other.

Student growth and their ability to make progress is essential for them to succeed and be college and career ready. John Hattie's research provides insight into what makes a visible difference in student learning. Hattie identifies a hinge point, something that will provide a year's academic growth within a year's time. He determined that anything with a 0.40 or greater effect size will provide such positive growth for students (DeWitt, 2014). The teachers' self-efficacy, the belief that they can positively affect growth in their students supports the school's mission to create life-long learners and enhances the sense of community that is present in their day-to-day work.

While our students have been successful both during their academic career while at Doherty and in their post-secondary education and career paths, there is a need to expand our offerings to meet changing student needs and to better prepare our students to be capable and contributing community members who can make a positive difference in our global community. This can be done by expanding our current programs, adding additional career pathways and providing our students with increased opportunities that reflect the global society in which they will interact. Doherty Memorial High School needs additional space in the physical plant in order to offer programs to meet the needs of our students. When we welcome families and students to our school, we feel that they are joining our Doherty family and we await the opportunity to have our family reside in a building that effectively meets the needs of our family and that provides the 21st century learning environment that the Doherty family and our community needs and deserves.

As part of the New England Association of Schools and Colleges (NEASC) Decennial visit in 2011, the commission cited several commendations including: the school pride amongst faculty and students, the strong relationships within the community including local businesses, colleges and universities, the development of measurable academic, civic, and social expectations, the caring and unified faculty willing to maintain a positive attitude toward teaching and in spite of working in an inadequate facility, the safe, positive, and respectful school culture, the open access philosophy encouraging all students to take advanced placement courses, efforts by staff to build connections with students, the willingness of the principal to share leadership with faculty members and the willingness of faculty members to take on leadership roles including as providers of professional development, the identification and support of at-risk students and communication between support services staff members and families, and the onsite health center which provides students with preventative and wellness care. The commission also cited recommendations and expressed some concerns largely focused on the building. These included: ensuring equal access to programs and services in all parts of the building for all students and staff members including handicapped access to programs and services on all levels, ensuring sufficient levels of staffing, instructional materials, technology, equipment, supplies, facilities and library/media resources to fully implement the curriculum, immediately addressing all health and safety issues within the facility including safe chemical storage, making repairs to windows, doors, water fountains, shower facilities in the locker rooms, and plumbing, lavatories and ventilation in lavatories, providing adequate heating and ventilation throughout the facility, providing adequate seating in the cafeteria so that all students may sit down to eat, and providing science laboratory facilities to all implementation of the science curriculum. Doherty Memorial High School remains on warning status due to the facility although the commission is pleased that we have been accepted to participate in this Feasibility Study and we are grateful to the MSBA for allowing us to engage in this process.

As a part of the Feasibility Study phase of the process, members of the Doherty Memorial High School community conducted a comprehensive review of the guiding documents and engaged in a number of activities in order to reflect upon our current programming and to recommend revisions/additions to our current programming to inform and guide our plans for the future. In addition to reviewing and referencing the NEASC Decennial report of 2011, and our District/ School Improvement Plans, another guiding document for this work included *Defining Our Path: A Strategic Plan for Education in Worcester 2018-2023*. The report was written in collaboration with the superintendent and several members of our community and organizations including the Worcester Education Collaborative, the Worcester Regional Research Bureau and the Rennie Center with support from the Barr Foundation, the George I. Alden Trust, and the Greater Worcester Community Foundation. There were multiple committees and subcommittees and the members of these groups gathered input from focus groups including educators, families, students, and community members. The focus areas of this strategic plan include: Culture of

Innovation, Academic Excellence, Welcoming Schools, Investments in Educators, and Technology and Operations. The goals of the Strategic Plan and the goals of our district and school level initiatives have been woven throughout our Feasibility Study and Educational Programming Development process for our vision of the new facility and the focus on 21st century skill development.

Another integral part of this phase of the project included members of our community participating in several Educational Visioning and Programming sessions with David Stephen of New Vista Design and the team of architects from Lamoureux, Pagano and Associates (LPA) as part of our Feasibility Study.

A summary of the Visioning Sessions and Responses is included below.

During the month of June 2019, the Doherty Memorial High School Educational Working Group (EWG), a group of approximately 20-25 Worcester Public Schools administrative leaders, teachers, parents, and community partners, participated in three Educational Visioning Workshops run by New Vista Design and LPA Architects. Each workshop was a collaborative session designed to inform the Doherty Memorial High School Feasibility Study and design process. Participants were led through a step-by-step visioning process aimed at capturing their thinking about Worcester Public School's current and future educational goals and priorities and connecting them to best practices and possibilities in innovative school facility design. Additionally, a Faculty Visioning Workshop was held on June 3, 2019 in which the entire faculty of Doherty Memorial High School met to offer feedback on their educational and architectural priorities and goals, and a Community Visioning Workshop was held on the evening of June 24, 2019 to share priorities established by the EWG and ask for feedback from the larger Doherty Memorial High School community.

On **June 3, 2019** the entire faculty of Doherty Memorial High School participated in a one-and-a-half-hour Educational Visioning Workshop that explored the following topics:

- ***Priority Goals*** for the renovated and/or new DMHS educational program and facility
- Visions for the Future of DMHS's academic and extra-curricular programming

On **June 5, 2019**, the Doherty Memorial High School EWG participated in Educational Visioning Workshop One. The four-hour workshop explored the following topics:

- ***Priority Goals*** for the renovated and/or new DMHS educational program and facility

- ***21st century teaching and learning practices*** as connected to Worcester Public School's present and future educational vision
- ***Strengths, Challenges, Opportunities, and Goals (SCOG Analysis)*** associated with Worcester Public School's current academic programs as well as the vision for its renovated and/or new facility
- ***21st Century Learning Goals*** that distill the group's best thinking with regard to Worcester Public School's current and future educational programming and priorities

On **June 17, 2019** the Doherty Memorial High School EWG participated in Educational Visioning Workshop Two. The four-hour workshop explored the following topics:

- ***21st Century Design Patterns 1.0*** that participants would like to see employed within the renovated and/or new DMHS facility
- ***Guiding Principles*** and priorities for design of the renovated and/or new DMHS facility

On **June 24, 2019** the Doherty Memorial High School EWG participated in Educational Visioning Workshop Three. The four-hour workshop explored the following topics:

- ***Blue Sky Ideas*** for the renovated and/or new DMHS facility
- ***Key Spaces and Adjacencies*** for the renovated and/or new DMHS facility
- ***Bubble and Adjacency Diagramming*** for the renovated and/or new DMHS facility

On **June 24, 2019** an evening Community Visioning Workshop was help, that explored the following topics:

- ***Timeline and Tasks*** connected to the MSBA Feasibility Study for the renovated and/or new DMHS facility
- ***Educational and Architectural Priorities*** that the DMHS EWG had determined for the renovated and/or new DMHS facility

Each workshop generated ideas, goals, and aspirations, and identified urgent needs, critical infrastructures, etc. from the perspective of school and community stakeholders. This input helped shape the design proposal by providing information about the following areas: the physical layout and space adjacencies; expanding current educational programs to better serve students; increasing community access so that the school's resources and features are available beyond the school day; creating flexible space so that in the coming decades all students graduate with appropriate college and career readiness skills; increasing educational programming opportunities to address the needs of the students and the community.

In May 2019, Doherty Memorial High School staff members completed an online introductory survey. This tool asked participants to reflect and identify current features and practices that excite and motivate the school community, but then also asked respondents to look to the future and highlight their aspirations for the school. Finally, staff members were asked to think about the end result of this design process and to review a list of sample visionary goals in order to select one or more goals that they identified to be the most important and impactful on the stakeholders. For example, one respondent identified the importance of collaboration, and the opportunities available in a newly designed space with this still in mind:

> *I am excited about using different ways for students to collaborate both face-to-face and online.*
>
> *(In the future…) I would like to see more space for collaboration and more flexible space that can easily be adapted as our needs change throughout the school year as well as over the years. I would like to be able to have large spaces available for big groups to work together as well as small study areas for groups to meet with teachers. I would like to continue to expand the use of technology and to expand the media center to provide the students more of a collegiate experience for research.*

Another educator's goals were related to the goal of increasing interdisciplinary connections within their curriculum:

> *I am excited about all the available technology that benefits students learning English as A second language.*
>
> *(In the future…) I am excited about the available technology and project-based learning that integrates knowledge and skills from different content areas that students need to apply in their own student-led learning in order to tackle a real-world problem.*

On June 3, 2019, with the survey results as a catalyst for conversation, the entire faculty of Doherty Memorial High School participated in an Educational Visioning Workshop that explored their priority goals for the renovated and/or new Doherty Memorial High School educational program and facility, as well as their visions for the future of DMHS educational program and facility. The conversations and products from this session was grouped thematically and highlight the faculty's visions for the future.

Table 2

ACADEMIC PRIORITY	NUMBER OF VOTES

Core Values	30
Differentiated Instruction	22
Team Teaching	25
Cross Discipline Instruction	22
Student-Centered Learning	32
Social Emotional Learning	25
Professional Learning Communities	16
Technology Integration	45
Real World Connections	51
Service Learning	16
Internships and Field Studies	27
Community Service	23
Flexibility & Adaptability	22
Diverse Educational Opportunities	31
Career Pathways	28
Hands on / Project-based learning	32
STEM and STEAM	21
9th Grade Teams/Transition Support	29
Sustainability / Connections with Park	4

Faculty and community stakeholder input has guided the careful reflection of the current, and desired, educational programming and space design features within a modernized and purposefully planned space. For example, all stakeholders emphasized career pathways, which included desires for courses and programs of study that would better expose students to a variety of career options and help them develop skills and content knowledge. In addition, these career pathways would align with the needs and interests of underrepresented populations, and/or identify and implement programs for which there is a demonstrated student interest and need. With student survey data from Naviance, a comprehensive college and career readiness platform, relating to career interests, local, regional and national labor market analyses, and from a review of currently available local and area schools and training programs, Doherty Memorial High

School identified three additional Chapter 74 Career Vocational Technical Education programs that are included in this proposal.

Conversations have continued with members of LPA through July and August with input from school, district, and community stakeholders. Most recently, we participated in school visits to the following recent MSBA projects:

- West Bridgewater Middle High School; Grades 7-12, enrollment 619
- Billerica Memorial High School; grades 9-12, enrollment 1,610
- Dearborn STEM Academy; grades 6-12, enrollment 600

The lessons learned, the relationships developed, and the information gained during these visits have proven to be invaluable and have been incorporated into our educational visioning and programming as well as the overall design for the school. We are eternally grateful to the teams of people at each of these schools for their willingness to host our team and to share their insights and experiences. It is our hope, upon completion of our project, to be able to host teams from other schools that are engaged in this process. We are pleased to be working collaboratively with members of our community and with the MSBA in order to provide our students with the best educational program in a facility that supports teaching and learning for all.

A. Grade Configuration

Doherty Memorial High School currently serves students in grades 9-12 and the vision for the new school is to continue this grade configuration. The vision for the new school includes the addition of ninth grade academies designed to provide targeted supports to assist students in the transition from middle school to high school and to prepare them to be on track for graduation and college and career ready.

Ninth-Grade Academy/Teaming

Ninth grade and its associated transition to high school is often considered to be one of the most pivotal years in a student's academic career. Many students struggle with the change of schedule/start time, the challenge of working with new and unfamiliar teachers, and the changes within their peer group coupled with the changes associated with this stage in their physical, emotional, and social development. The challenge of a new school environment can lead to increased stress and contribute to academic, social, and behavior problems for some students.

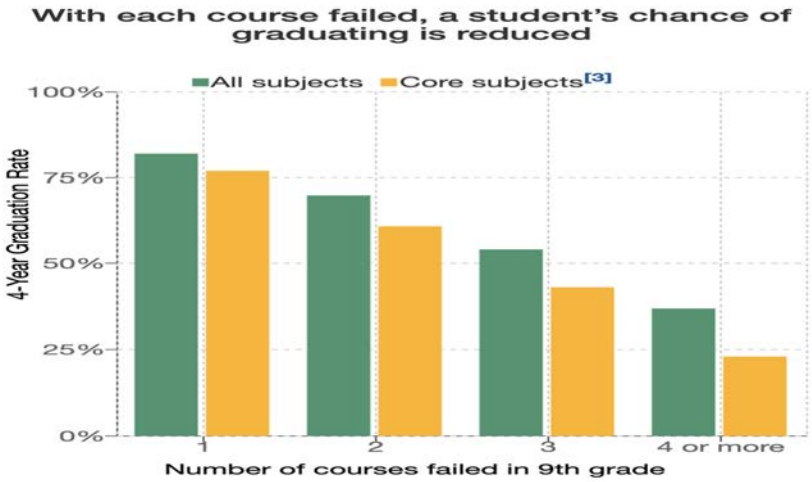
Neild's (2009) research indicates:

> "Transitions in schooling are moments of great promise for children, holding the potential for personal growth, new learning, and greater independence and responsibility...Students who do not navigate a school transition well face the possibility of personal and academic turmoil and even falling off track for promotion and graduation. The entrance to ninth grade marks one such critical juncture in American schooling" (p.53).

The majority of the ninth-grade students transition from Forest Grove Middle School, Doherty's primary feeder school. Each year, additional students enroll having completed the eighth grade in a private school, a school outside of the district, or a different Worcester Public Schools' middle school (special permission). Ninth and tenth grade students in the Engineering and Technology Academy (ETA) are placed in a grade-specific team where they share the same core academic teachers. At present, this is the only Grade 9 team that is available to students.

Research indicates students who have experienced even a moderate level of difficulty in middle school are at a greater risk for not succeeding during the transition to high school (Neild, Balfanz & Herzog, 2007). Students who struggle in ninth grade may have to repeat courses, placing them off-track for graduation in four years with their cohort of peers. Data from the Massachusetts Department of Elementary and Secondary Education (DESE) indicates that 96% of students who pass all of their ninth-grade courses will graduate in four years. That number drops significantly as only 64% of students who failed at least one ninth-grade course graduate in four years. (Https://abcs.sites.digital.mass.gov/)

Figure 2



https://abcs.sites.digital.mass.gov/data/9/grade_9_data_viz2.csv

Statistics such as this indicate the need for ongoing, targeted support and a need for a change in programming to support ninth grade students. The recognition that laying a strong academic foundation to support ninth-grade students to be college and career ready and to graduate with their cohort of peers within four years, coupled with the ever-growing concern for reducing the number of ninth-grade students who fail classes, drives the desire to seek additional support for ninth-grade students.

We currently offer several programs to support students' transition to Grade 9. These programs include a fall Open House for students and families, outreach to middle school students to help students plan for course selection, an outreach program for parents to provide course information, a parent orientation prior to the start of the school year, and a two-day Jumpstart program prior to the start of school to support students and prepare them to have a successful start to ninth grade. While these supports are beneficial to students there is a demonstrated need for additional supports for ninth grade students.

Presently, ninth-grade students at DMHS attend classes that are scheduled in classrooms in areas designated for each academic discipline throughout the building. These frequent transitions are often a cause of stress for many new students who begin their high school career feeling lost or overwhelmed by a comprehensive high school schedule in a large building. Ninth-grade students participate in classes taught by different teachers who often do not share common students. Other than the ETA program, there is no central location for these ninth-grade students to attend classes or the opportunity for them to share a common group of teachers who could monitor their progress and plan coordinated supports.

Ellerbrock and Kiefer (2014) define a community of care as a 'school culture in which students and teachers care about and support each other, individuals' needs are satisfied within a group setting, and members feel a sense of belonging and identification with the group" (p.3). While our teachers take an interest in the well-being of all of our students and work diligently to support them during their transition to high school, their desire to form such a community of care specifically to support ninth-grade students is impacted by the lack of space in the current building which prevents the ability to schedule all ninth-grade students into ninth-grade academies /teams.

The vision for the ninth grade in the new school is to create a ninth-grade neighborhood to promote a supportive community, or a community to guide students during the transition from middle school to high school. This would include an area of the school designated specifically for ninth-grade classes with close proximity of classrooms for core academic classes that would allow for teaming and cross- curricular sharing and designated collaborative space to successfully deliver the curriculum and support ninth-grade students during their transition to

Doherty Memorial High School. Teachers would be able to utilize a team-approach by sharing the same caseload of students allowing them to build stronger bonds with ninth-grade students and offer a range of supports.

All ninth-grade students take the core academic subjects in addition to required elective courses. The typical ninth-grade schedule includes English I, Algebra I or Geometry, Biology, World History II, World Language, Physical Education (0.25 credits), Introduction to College and Career Readiness (ICCR), and (0.25 credits) Arts elective/other additional core electives.

As part of a ninth-grade academy, students and teachers will benefit from close proximity of grade-alike courses and shared collaborative space within sightline of classrooms, designed to facilitate break-out sessions, foster cross-curricular sharing and study as well as support interdisciplinary project-based learning. Such common areas will support such opportunities and allow for shared presentations and collaboration among teachers and classes. These areas need to be able to support a distributive model for technology (Chromecarts) and opportunities for students to publish (both in print and digitally) and present materials.

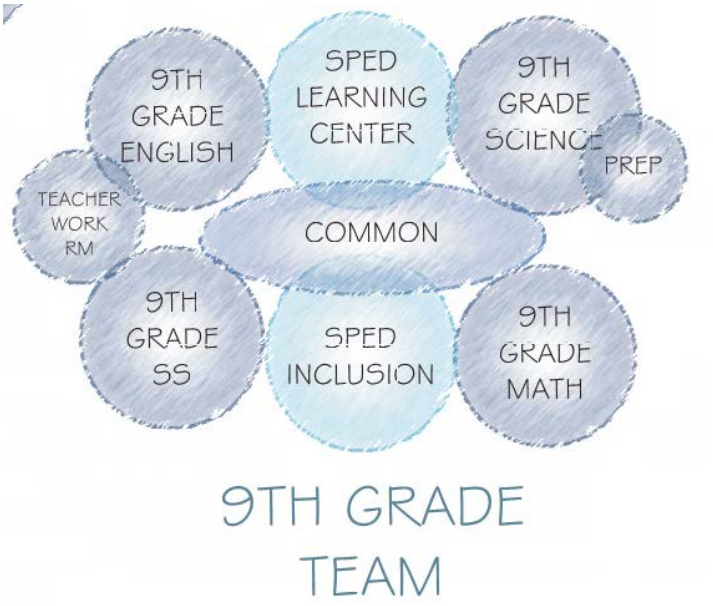
Teachers from each content area, working in grade-alike Professional Learning Communities (PLCs) can focus on their particular group of shared students and plan engaging and rigorous instruction while reviewing data and identifying academic, social/emotional, and behavioral issues of their shared students. Within this collaborative space there needs to be an area dedicated to supporting professional learning, complete with areas for presentation and modeling classroom strategies.

In order to support the ninth-grade team as part of the transition program, there will need to be ease of access to other school support services and flexibility to grow and change these spaces as enrollment and student needs change. Flexible office space than can be used to house an administrative and other support staff will help to support the program and foster a community of care for the students (Ellerbrock & Kiefer, 2010; Ellerbrock & Kiefer, 2014).

The proposed ninth-grade academy will be able to utilize the school's bell schedule but will have the flexibility to combine classes for programming opportunities. The break-out spaces should be large enough to allow multiple classes or a team to meet for presentations for both students and their families and have appropriate technology (Epson boards, document cameras, sound system, etc.) to support such programs and presentations. The classrooms should have collaborative doors to allow for team teaching and integration of subjects. Additionally, each area of this part of the building will need appropriate heating/ventilation and natural light to provide a welcoming and productive environment. Students will need access to lockers within the academy to allow for ease of access during their time in their core academic classes. The ninth-grade academy will

house classes for the core academic subjects and therefore should be located between the humanities and the STEM neighborhoods to allow for vertical articulation and collaboration in each subject area.

LPA|A Response: The preferred solution includes neighborhoods for (4) ninth-grade teams. One of the ninth-grade teams is associated with the ETA program, and the remaining three are stacked vertically on the floors above. Each ninth-grade neighborhood includes (3) general classrooms, (1) science lab, (1) inclusion classroom, (1) learning center (resource) classroom, a teacher planning space and a common room.



Advanced Academy

In January 2012, during his inaugural speech, Mayor Joseph M. Petty announced a goal of establishing an exam school in Worcester as part of his educational platform. Subsequent to that speech, Mayor Petty appointed an Ad-Hoc Committee, chaired by School Committee member Tracy O'Connell Novick, and comprised of other school committee members, higher education partners, community partners and parents. This Ad-Hoc Committee was charged with studying "the feasibility of establishing an exam school for students in Grades 9 to 12 which would develop and promote academic excellence relevant to success in the 21st century." They spent several months researching, studying and visiting exam schools, and researching available curricula and programs such as the International Baccalaureate and Project Lead the Way programs, as it formulated recommendations to be presented to Mayor Petty and the Worcester School Committee. Additionally, several public hearings were held throughout the time.

In June 2013, the Ad-Hoc Committee recommendations were forwarded by the Worcester School Committee to the Superintendent for consideration in the creation of a proposal to establish a high school option for high achieving students. Since that time, the Worcester Public Schools Superintendent and Senior Leadership Team members have reviewed those recommendations and conducted additional research resulting in a proposal for "A Pilot Innovation Academy for Worcester Public Schools."

As indicated in the Statement of Interest (SOI), and in the Request for Designer Services (RFS), the Advanced Academy was initially proposed (Fall 2013) to be housed at Doherty Memorial High School but due to lack of space, this did not occur. At the time, this program would have involved an additional 250 students and would require ten classrooms dedicated to advanced academics for the Worcester district. If there had been additional space at Doherty, it would have provided a central location for students from all areas or the city in a location that did not cost the district any additional monies in rental agreements.

While Massachusetts leads the nation in most educational indicators, it is virtually silent on the identification and education of gifted and high achieving students. Worcester Public Schools has been on the forefront of academic programming for these students. Specifically, the Goddard Scholars Program serving gifted and high achieving students from across the district at Sullivan Middle School and South High Community School. The Goddard Scholars Program at Sullivan Middle School is one of the district's first innovation academies. The teachers in that program have expanded their knowledge of and implementation of pedagogy and best practices in gifted education. The Arts Magnet Pathway from Worcester Arts Magnet School to Burncoat Middle School to Burncoat High School has developed students with gifts, talents and interests in the visual and performing arts for many years with state and national recognition of their performances, productions and artistic creations. Across the district for gifted and high achieving students, Worcester Public Schools offers 23 Advanced Placement Courses to students. Additionally, our students are able to earn college credit through dual enrollment opportunities with local colleges and universities.

It should be clearly noted and understood that this Advanced Academy is not designed to replace or supplant any of the existing programs serving gifted and high achieving students. Rather, the Academy will be an additional option within the Worcester Public Schools portfolio of school and program offerings. The district will continue strong support for and enhancement of those existing programs.

Doherty Memorial High School, and the Worcester Public Schools, is poised to begin implementation of the Advanced Academy through communication and outreach efforts starting in the district's middle schools. In addition to core academics, students throughout Grades 7-12

in the Advanced Academy will enroll in coursework focusing on the biomedical and biotechnological sciences. The target population is students who have demonstrated exceptional interest in and an ability to be successful in a rigorous high school program of studies leading to advanced college readiness. The Academy will attract students from throughout the City of Worcester and will enroll 50 students per grade, for a total of 200 students from across the district. Students would apply while in Grade 6. Accepted students would join together to form a cohort, and this group would matriculate to a common middle school (Forest Grove Middle School), which is the primary feeder school to Doherty. This cohort would take core academic courses, and an introductory science course within this Biomedical Sciences sequences. This cohort would remain together in Grade 8, and then all would move on to Doherty Memorial High School for ninth grade.

School and district personnel within the Advanced Academy would review all middle school students' academic records and invite students who receive Advanced in both English and Math on the MCAS in Grade 6 to apply to attend the academy. This is similar to the other programs in the district, including the Goddard Scholars program a South High Community School and the Hanover Academy at Burncoat High School. Beginning in the 2022-23 school year, 50 students will be accepted from all areas of Worcester, including but not limited to the Doherty quadrant.

The district will create an admission set of criteria, an application, and a process for selecting and notifying students. The admissions criteria will include:

- A completed application
- A review of academic grades from the student's seventh and eighth grade transcripts
- MCAS and/or other state assessment scores
- Transcript/grade report showing courses enrolled in and completed in middle school
- Student essay
- Teacher recommendation from one core academic teacher
- Attendance history
- Other criteria, if any, that the district deems necessary.

The application process will be coordinated by the district and Advanced Academy Assistant Principal, and applications will be reviewed and scored. Should the number of eligible students oversubscribe the number of available student slots, a lottery will be held.

The Advanced Academy, in addition to Massachusetts general education course requirements and college and career readiness skills, will incorporate and deliver a coherent curriculum focusing on the biotechnology and biomedical sciences. Labor Market trends from Central Massachusetts, statewide, as well as from national databases all demonstrate an increasing need for qualified employees. Further, there are numerous entry points to the Biomedical and related fields based on the students' level of education, including Associate's and Bachelor's Degrees.

Advanced Academy – Biomedical Curriculum Focus - Occupational Projections
Table 3

Central Massachusetts Employment Projections – STEM and Related Occupations, Executive Office of Labor and Workforce Development					
Occupation	Employment 2016	Employment 2026	Percent Change	Typical Education needed for Entry	2018 Mean Annual Wage
Chemical Technician	168	170	+1.19%	Associate's Degree	$57,829
Biological Technician	296	319	+7.77%	Bachelor's Degree	$43,311
Medical and Clinical Lab Technologist	784	880	+12.24%	Bachelor's Degree	$61,876
Medical and Clinical Lab Technician	166	181	+9.04%	Associate's Degree	$43,824
Microbiologist	166	175	+5.42%	Bachelor's Degree	$85,279
Biological Scientist	195	216	+10.77%	Bachelor's Degree	$72,822

In Worcester alone, Biomedical- and Biotechnological-related industries have increased their presence. Support from local post-secondary schools demonstrates a strong current and healthy outlook for future needs. For example, in 2010 Worcester Polytechnic Institute (WPI) completed the development of their Gateway Park – a facility blending research, studies, innovation, and industry. Within this multi-facility park, WPI designed and implemented a Biomanufacturing Education and Training Center, as well as a Life Sciences and Bioengineering Center. In addition, several private industries have established sites within the complex. In 2006, Dr. Craig Mello, of the University of Massachusetts Medical School, was awarded the Nobel Prize for his work in Medicine and Physiology. This accomplishment heightened local attention to this growing field. Assumption College offers degrees in Biotechnology and Molecular Biology, Quinsigamond Community College provides Associate's Degrees and Certification trainings in several related fields, and many other area colleges offer similar programs and coursework.

The Advanced Academy sequence of courses will blend district-developed courses with nationally recognized providers of rigorous and innovative curriculum: Project Lead the Way (PLTW) and the College Board's Advanced Placement (AP) Program both offer curricula and resources that emphasize the utilization of information and skills from the classroom to a career.

The Advanced Academy courses focusing on the biomedical and biotechnological sciences will be available only to students accepted into the program.

Doherty currently offers a Biochemistry course to students in Grades 11 and 12. From a review of post-secondary degree programs and related coursework, as well as identifying common preferred skills for those seeking employment in biomedical and biotechnological fields, the school will be working with secondary, post-secondary, and industry professionals to design additional course offerings to ensure students are appropriately prepared for their entry into college and/or into a career. These courses will likely focus on genetics, gene editing, immunology, microbiology, laboratory skills, and a strengthening of the existing biochemistry coursework. As a result of this partnership, the goal is for students to see practical applications of this work through learning opportunities within the community.

Project Lead the Way's Biomedical Sciences (BMS) Curriculum Program is designed for secondary-level students and engages students in learning content and activities relating to human medicine, bioinformatics, cell biology, genetics, disease and other biomedical topics. The BMS program offers a sequence of three foundation courses and ends with a capstone course. These courses are designed to support and enhance Doherty's core science course offerings.

There is a strong programmatic alignment between PLTW and the College Board. Curriculum sequencing within the Biomedical Sciences program align and mutually supports Advanced Placement Biology and Chemistry courses. The PLTW courses emphasize applied learning and provide foundational coursework and learning activities to introduce students to the field. In Grades 11 and 12, the specialized PLTW courses focus on knowledge and skill development for entry to college and careers. The AP courses, and associated exams, provide additional opportunities for advanced coursework, as well as college credit.

As part of the MassCore graduation requirements, all students in the Worcester Public Schools must complete a minimum of three laboratory-based science courses. The majority of students, to ensure college and/or career readiness, enroll in a science course each year. To successfully offer this advanced Biomedical Science coursework, students in each grade will be enrolling in an additional laboratory-based science course. For example, students in Grade 9 will take Biology, the traditional first-year course offered to all students in Doherty. This course engages students in rigorous learning experiences, lays the foundation for subsequent coursework, but also prepares students for the MCAS exam. Ninth- grade students accepted into the Advanced Academy will also enroll in the PLTW Principles of Biomedical Sciences course. By participating in this course of study and by engaging in college and career readiness activities throughout this program, these students will be well-prepared and knowledgeable about the many opportunities in this field in terms of college majors and employment opportunities both locally and globally.

Often, students enroll in one science course per year. During the 2018-2019 school year, 102 students enrolled in two or more unique science course offerings. With the inclusion of this Biomedical Science program, 50 additional students will be taking two laboratory-based science courses simultaneously. This added enrollment will necessitate an additional science laboratory, and associated storage and preparatory spaces. Each of these BioTech/Biomedical Science courses will be designed for 1 credit, or the equivalent of a 1-period, full-year course. Advanced Placement Biology and Chemistry courses, due to the rigorous laboratory work embedded within their respective curricula, are 2 credit courses, requiring 2 periods of instruction each year. Therefore, at full enrollment Doherty expects to run an additional 12 periods of science instruction each year. With a seven-period day, the implementation of the Academy will necessitate an additional two dedicated laboratory classroom spaces. One of these laboratories will be utilized for advanced coursework in anatomy and physiology and will be supported by the inclusion of at least 2 Z-Space, or virtual dissection tables. These state-of-the-art AR/VR devices provide industry-level training and skill development and avoid the necessity of dissection specimens.

The Academy-related science classrooms and laboratory spaces would ideally be situated within the science cluster: there is no necessary adjacency to another program or space within the building.

Students in the Academy will benefit from shared enrollment in the other general education courses at Doherty Memorial High School, such as Mathematics, English, Social Studies, etc. In addition, Academy students will have access to the range of other elective and required courses including Physical Education, Health, Arts and a range of Advanced Placement courses.

LPA|A Response: The preferred solution floor plans includes one Biotechnology Lab and Prep room integrated within the Science department for maximum efficiency. Equipment unique to the biotechnology lab will be included in the FF&E budget.

B. Class Size Policies

Doherty Memorial High School follows the class size and teacher course load policies set by the Worcester Public Schools. Each teacher has a maximum of 125 students in his or her caseload which consists of the combined total of their five classes with an average of 25 per the negotiated teacher contract. During the 2018-19 school year, the average class size at Doherty Memorial High School was 22.2. However, during the same school year there were 451 classes with over 25 students enrolled in them and 27 courses with enrollments of 30 or more. Some programs, such as the Engineering and Technology Academy (ETA) are impacted by the class size and

space requirements for safety reasons. As a result, the number of students who are able to participate in the ETA at each grade level is capped at 100, following the Career Vocational Technical Education (CVTE) guidelines.

The National Science Teacher Association safety guidelines recommend no more than 24 students in a laboratory setting at one time. Another guiding document – the STEM Learning Design's Review and Recommendations of Best Practices for K-12 STEM Learning Spaces report – also recommends a maximum of 24 students in the laboratory. In addition, the Worcester Public Schools contract designates a maximum teacher load of 125 students, and all teachers are assigned 5 teaching periods, resulting in 25 students per class. All classes will be scheduled with safety recommendations in mind.

Class Size Data for Doherty for Core Academic Subjects for 2018-2019

Table 4

MATH	**Average Class Size**	**# Classes**	**# Students**
Algebra 1	24.09	11	265
Geometry	24.68	16	395
Algebra 2	28.08	12	337
Statistics	23	1	23
AP Statistics	28	1	28
Pre-Calculus	26.6	8	213
Calculus	25.5	2	51
AP Calculus BC	30	1	30

AP Calculus AB	20	1	20
SCIENCE	**Average Class Size**	**# Classes**	**# Students**
AP Biology	25.33	3	76
AP Environmental Science	28	2	56
AP Physics 1 (AP Physics 2)	24.66	3	74
Biology 1	24.11	17	410
Biology 2	24	4	96
Biotechnology	25	1	25
Chemistry	24.3	13	316
Physics	26	4	104
Human Anatomy	26.8	10	268
Social Studies	**Average Class Size**	**# Classes**	**# Students**
World History II	23.68	16	379
US History I	25.68	16	411
US History II	27.3	13	354

Psychology	25.8	5	129
Sociology	15	3	45
AP World History	11	1	11
AP US History	25	2	50
AP Psychology	21.66	3	65
AP Human Geography	24.75	4	99
AP Government and Politics	23	1	23
ENGLISH	**Average Class Size**	**# Classes**	**# Students**
English 1	20.05	18	361
English II	22.4	17	381
English III	27	14	375
English IV	23.6	13	307
World Language	**Average Class Size**	**# Classes**	**# Students**
Spanish 1	15.25	8	122
Spanish 2	20.06	15	301

Spanish 3	19.75	8	158
Spanish 4	19.5	2	39
AP Spanish	17	1	17
French 1	25	2	50
French 2	13	2	26
French 3/4	10	1	10
Latin 1	17	2	34
Latin 2	16	1	16
Latin 3/4	8	1	8

Class Size data for the Worcester Public Schools
Table 5

All Classes 2017-18			
Grade Level	Avg Class Size	# Classes	# Students
PK	15.2	77	1167
K	18.9	928	17519

English, Math, Science, Social Studies, Foreign Language, Arts, CTE and CVTE Classes			
Grade Level	Avg Class Size	# Classes	# Students
PK	14.6	66	963
K	17.4	655	11418

1	25.9	560	14505
2	27.3	532	14521
3	25.9	511	13231
4	24.1	483	11649
5	28.2	470	13241
6	15.5	19	294
7	19.5	177	3450
8	19.0	805	15256
9	19.6	223	4366
10	14.5	779	11285
11	14.0	696	9768
12	13.5	1008	13567
88	8.9	64	570
99	9.1	284	2592
District	19.3	7616	146981

1	25.9	480	12431
2	27.3	456	12446
3	25.9	438	11339
4	22.1	414	9155
5	24.3	402	9751
6	18.3	13	238
7	18.8	150	2823
8	18.2	715	12993
9	19.8	175	3461
10	15.2	591	8979
11	15.3	543	8323
12	14.9	755	11274
88	8.9	64	570
99	12.0	158	1894
District	19.4	6075	118058

Additional course offerings are impacted by the lack of available classrooms. In order to offer additional courses to support college and career readiness in the global community, we would need both additional teachers and classroom space. While some classroom space needs to be specific to the course offerings, such as science courses or Career Vocational Technical Education, (CVTE) courses, other additional classroom space needs to be flexible in order to adapt to changing course needs and to support future changes in the curriculum frameworks.

LPA|A Response: General classrooms are sized at 900 NSF to accommodate an average of 24–25 students per class, flexibility for a variety of teaching methods, and space for

inclusion services. Communicating doors between classrooms and Common Rooms are designed to support team teaching, project based learning, and special education inclusion programs.

C. School Scheduling Method (including Advantages and Disadvantages)

The school day begins at 7:20 a.m. and ends at 1:43 p.m. and includes a traditional seven-period day. The scheduling process is completed through a collaborative effort between the administration and the guidance department. Periodically throughout the year, the guidance staff meets with students to discuss their academic programming. Each spring, counselors work with students to complete the course selection process for the upcoming year. Attention is given to areas of student interests, college and career goals, and graduation requirements. Beginning in the 2018-19 school year, the course selection process was done electronically but in previous years had been done on paper and then the data entered into the computer program. By having the students complete this part of the process electronically in the portal, families can review and discuss the selections together and adjust accordingly. The courses are then approved by the counselor to be sure that they are consistent with all grade level requirements. This way, the data can be uploaded directly to formulate course tallies without data entry errors. Course tallies are used to determine the number of sections of each course to be offered and every effort is made to accommodate students' requests for courses. The scheduling program used by the Worcester Public Schools allows for flexibility as the process evolves, including allowing us to do batch scheduling changes and to link courses through Mass Schedule Edit feature.

The difficulty we face in the scheduling process is available classroom space to accommodate the courses and number of sections we need to offer. The school is overcrowded, and the facility does not support the needed academic programming. Room utilization is at nearly 100% for most spaces throughout the day. The classrooms used for the Special Education classes are too small to use for most other courses or purposes and some courses are being taught in spaces for which they were not intended. For example, art is being taught in a converted home economics classroom. Science is being taught in rooms that are not equipped for labs. Additionally, 50% of the teachers travel from room to room to teach their classes and noble attempts are made to limit the distance in order to avoid adversely affect teaching and learning.

Doherty calculated the room utilization rates for each department, for general and special education, and for the school. In this calculation, we considered every space available, even those classrooms that provide instruction through an open-concept approach. For example, one of our classrooms (room 212) is subdivided into three spaces (212A, 212B, 212C) even though

all are within the same class area. This subdivision of additional classroom space is due to the severe overcrowding within the current building.

With nearly 100% room utilization, we are not in a position to easily add staff to our existing building, and therefore must maintain careful supervision of caseloads, class sizes, and contractual agreements. A disadvantage for our school is that the SAGE (Student Attendance Grading and Enrollment) program allows for each counselor and administrator to make changes to a student's schedule. This can be problematic forcing us to monitor these types of changes. At times we must follow a one-student-out / one-student-in policy in order to adhere to the teacher caseloads as prescribed by the negotiated contract.

Room Occupancy Information (2018-2019)

Table 6

Department	# Assigned Classrooms	# Available Periods of Instruction	# Instructional Periods used by department/assigned personnel	# Instructional Periods used for other departments, coursework, scheduled sessions	Combined Usage Rate per day
Math	11	77	64	9	73/77 = 95%
Social Studies	10	70	64	4	68/70 = 97%
World Languages	7	49	43	4	47/49 = 96%
Art	2	14	14	0	14/14 = 100%
English Language Arts	10	70	61	5	66/70 = 94%
Science	10	70	62	3	65/70 = 93%
Computer Science	2	14	11	1	12/14 = 86%

CVTE Engineering Technology	4	28	20	5	25/28 = 89%
Gymnasium	1	7	7	0	7/7 = 100%
Health	1	7	5	1	6/7 = 86%
Music/Theater	2	14	14	0	14/14 = 100%
Miscellaneous	3	21	17	3	20/21 = 95%
EL	2	14	10	4	14/14 = 100%
School Usage Rate for Classrooms able to hold a general education sized classroom				431/455	94.7%
Special Education	9	63	53	0	53/63 = 84%
School Usage Rate for classrooms with a layout able to accommodate 5-15 students				53/63	84%
School-wide Classroom Usage Rate, All Students/Courses				484/518	93.4%

With the 2019-2020 schedule, the room utilization pressures have increased with the addition of new staff members and the increased student enrollment. Within the current space, there are 76 total classroom spaces, albeit several rooms are really subdivided spaces within a single classroom space. Of these 76 rooms, 9 are designated as SPED spaces. 67 therefore are general education spaces, which includes science, health and physical education, art, CVTE programming, and core and elective programming. During the 2018-2019 school year, these spaces had a 94.7% utilization rate, and this was based on a maximum population of 1,529

students. The school utilized non-traditional classroom space for four periods throughout the day, including the utilization of the library (3) and the auditorium (1) due to scheduling demands. The school also assigned five sections into the cafeteria, as there were limited, or no, available classrooms for those respective periods.

The student population is expected to increase by approximately 150-180 students. As each student needs 7 classes per day, this translates to, at a minimum, an additional 42 instructional periods of core and elective instruction (150 students x 7 periods ÷ 25 students per section). 42 instructional periods correlate to 6 full classroom spaces (42 spaces ÷ 7 periods) at a minimum. As we understand the MSBA space summary template, there are 80 non-SPED capacity generating spaces. With the increased student population and commensurate increase in course offerings, Doherty estimates the room utilization rate as follows:

During the 2018-2019 school year:

- 67 general education classroom spaces
- 7 periods of potential utilization; 67 x 7 = 469 instructional periods available utilization rate of 94.7% = 444 instructional periods taught within the general education classroom spaces.

Within the PDP proposal for the new building:

- 80 general education classroom or capacity generating spaces proposed
- 7 periods of potential utilization; 80 x 7 = 560 instructional periods available
  If we assume current scheduling (444 instructional periods) and factor in the minimum addition of 42 instructional periods, then the total minimum instructional periods being run will be 486

This creates a utilization rate within the general education spaces of approximately 86.7% (486 ÷ 560). In reality, there will likely be more than 42 additional periods created due to the increased population, and each additional period will increase the school's room utilization rate.

In addition, when compared to other schools, Doherty is currently understaffed for its student population. Doherty is unable to grow current programming due to lack of space; average class sizes, counselor ratios, etc. are comparatively high; and many classrooms are inadequately sized and provisioned. When planning for the new school, Doherty's proposal seeks to remedy these issues by offering additional programming, hiring additional staff, ensuring all classes - general and special education - are taught in appropriately sized classroom, etc. Currently, there are many special education students who receive a range of services, as well as are included within

the general education classroom(s) to varying degrees. Each year, the numbers of students in full or partial inclusion change. The Space Summary template as well as the adjacency diagrams included within the PDP demonstrate the flexible orientations that will be possible as special education classrooms are integrated into the core academic spaces.

The advantages of having a scheduling program within the database written by members of the district and specifically for our district is that the modules, reports and overall program can be customized to meet the needs of our district and of the individual schools within the district. A committee, composed of several individuals across the district and led by the Manager of Instructional Technology and Digital Learning, is currently reviewing other options for scheduling and database management products to determine how to best support the needs of the district as one disadvantage to our current program is that many commonly used, industry standard programming packages (e.g. PowerSchool) more readily interface with the varied sources of student and school-wide data (e.g. standardized exam results from the CollegeBoard, or the ability to import/export information into Naviance, the college/career planning platform) and that many commonly used, industry standard programming packages provide a singular interface for all stakeholders to access information including grading and progress reporting and to facilitate communication between groups (e.g. student-to-teacher, teacher-to-parent, school-to-family).

The vision for the new school is to continue to use the district high school bell schedule which consists of a seven-period day, so every class meets every day. While our previous bell schedule included a rotating extended block to support learning activities that may have benefitted from additional class time on a six-day rotation, the new schedule has been implemented across the district beginning this school year. This recent standardization of bell schedules has allowed district-wide participation in Early College and Dual Enrollment opportunities for students in all of our high schools. The plan is to continue to utilize the district scheduling program while other options are explored by district personnel. Additionally, all Grade 9 students will be scheduled into ninth-grade teams to support their successful transition to high school as described in detail in the grade configuration section of this document.

LPA|A Response: The number of teaching stations indicated in the space summary aligns with the number of spaces needed within the projected schedule to support 1670 students. Most frequently accessed academic spaces are grouped together to reduce between class travel time.

In 2016, at the onset of the MSBA process, the proposed enrollment for Doherty Memorial High School was set at 1,670 students. This figure was determined as a result of a collaborative analysis of enrollment projections and space capacity needs for the Doherty Memorial High

School project. This enrollment figure was based on demographic trends, as well as the recognition that Doherty has one vocational program.

As design work continued, and as more community and varied stakeholder input was gathered, for example through a series of school and community member visioning workshops, the community's desire to grow the curricular and college/career programming options available to students became evident. After much stakeholder input, from a review of current district educational program offerings, and with a thorough labor market analysis, the school is including within this design a proposal to add three vocational programs as well as an advanced academy with a curricular focus on the biotechnology/biomedical sciences. These four additional programs would be open to all students from across the district.

Doherty currently offers a vocational Engineering Technology program. This program was certified 10 years ago, and all Worcester residents are eligible to apply. Each year, the school admits students from across the district, including some entering the public schools from the area's private and parochial options. Enrollment figures for the 2019-2020 school year are representative of this pattern. Of the 370 students currently enrolled in Grades 9-12, 57% of these students reside in the Doherty quadrant and, theoretically, would be eligible to attend Doherty based on their home address. The remaining 158 students are 'out-of-district' and, without the benefit of the vocational program, would be assigned to their home school.

When the enrollment projections for the project were determined, the committee took into account the existing vocational program (Engineering Technology) as well as anticipated population trends across the city. After planning sessions, visioning exercises, and community input, the committee has included the three additional vocational programs and the advanced academy, all of which are available to students from across the district. There is a possibility that there may be greater student interest in Doherty and/or the available programming than expected. If so, then the student population could surpass 1,670.

The three additional vocational programs, along with the Advanced Academy, will similarly be available to all Worcester residents. It is reasonable to predict that a comparable percentage of 'out-of-district' students will be admitted to these programs. Due to concerns about overpopulation, the district has decided to reduce the enrollment of the new vocational programs that are held during the school day without changing the space summary specifications.

- Programming and Web Development: Program enrollment is estimated at 160 students.
- Construction Craft Laborer: Program enrollment is estimated at 120 students.
- Marketing, Finance and Management: Program enrollment is estimated at 160 students.
  Advanced Academy: Program enrollment is estimated at 200 students.

This does not account for the students applying for, and receiving, special permission, which allows students to obtain a voluntary transfer and to enroll in the general education programming at our school from a different "home school" within our district.

Admittedly, it is difficult to predict the application figures for these new programs. However, the school administration is mindful that students are always able to attend their home school, which is the school assigned to them based on their current home address. There is a subset of Worcester students who can attend Doherty Memorial High School through the voluntary transfer process without applying or being accepted to any of these vocational programs or the advanced academy.

In planning for the future, the school will have the capacity to increase the student population within these programs. Similar to the Innovation Pathways Program, the school would have the capacity to offer course offerings for students after-school hours.

LPA|A Response: The preferred solution floor plans include flexible classroom wings that can be grouped and scheduled in a variety of ways in response to changes in enrollment. The Chapter 74 spaces are also located for secure access after typical school hours. The design team will continue to review for opportunities to build in flexibility within the space summary guidelines.

D. Teaching Methodology and Structure

Doherty Memorial High School maintains high expectations for all learners while providing them with academic and social-emotional support needed for success in school and in life. The school is guided by its mission and core values and uses its focus statement to support student learning.

Mission Statement

Doherty Memorial High School empowers students to become critical and independent thinkers as well as life-long learners. We encourage diversity and creativity as we partner with our students and their families, our teachers, and our community to provide an education in a safe and caring environment.

Core Values

Academic Values

- Thinking critically
- Thinking independently
- Responding thoughtfully
- Practicing life-long learning skills
- Applying creativity

Civic and Social Values

- Appreciating diversity
- Partnering with students, families, and community members
- Working within a safe and caring environment

Focus Statement

Doherty Memorial High School is implementing a school-wide effort to demonstrate measurable growth in students' ability to read critically and respond thoughtfully in writing as evidenced by progress on external measures, such as the MCAS and the PSAT, and internal measures, such as Star and other common assessments

Doherty Memorial High School is a comprehensive high school. The faculty/staff is organized by academic departments: English Language Arts (ELA), Science, Mathematics, Social Studies, Career Vocational Technical Education (CVTE) Programs, Music, Art, Special Education, World Languages, Guidance, Physical Education (PE), and Administration. Faculty members meet by department to plan instruction, engage in professional learning opportunities and collaborate in Professional Learning Communities (PLCs) within these departments or grade-alike groups. Additionally, some teachers of elective classes (Art, Music, PE, Marketing, and Health) meet within one of the departments, or participate in similar monthly meetings with district-level personnel.

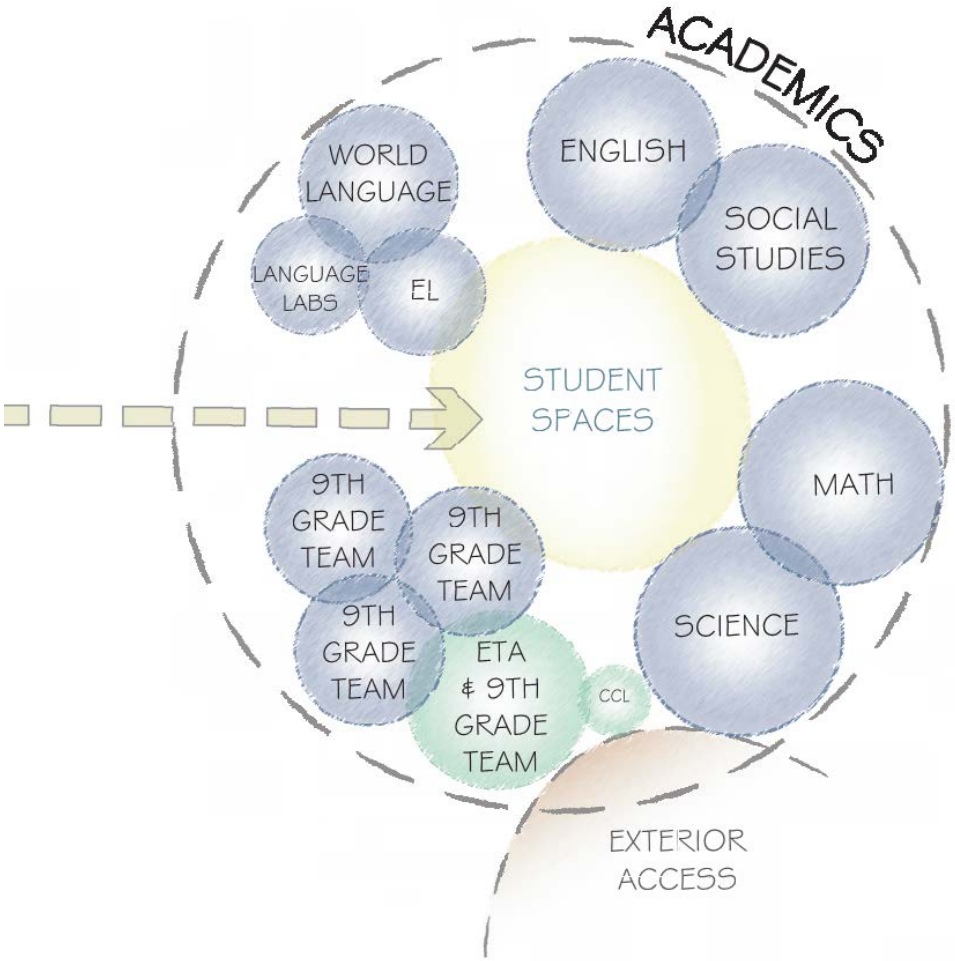
Most departments are assigned a set of classrooms for their primary use, and as such most classrooms within a department are located in proximity to each other. There are several 'departmental' classrooms that are not located near the other classrooms in their department due to the layout of the building, along with the limited classroom spaces.

Doherty has a CVTE Engineering Technology program that includes two grade-level, interdisciplinary teams (Engineering, Mathematics, Social Studies, Science, and ELA), one for

Grade 9 and the other for Grade 10. The Grade 9 team, and the associated departmental classrooms, are located in proximity to one another and near the engineering classroom and laboratory space.

While there are a few areas in the current facility that have air conditioning it is important that the new facility have proper heating and cooling capabilities throughout the entire school in order to support optimal teaching and learning.

LPA|A Response: The academic areas are organized according to the partial adjacency diagram below, with four 9th grade teams (one integrated within the ETA program) and departmental organization for grades 10–12. The departments will be located to support alliances between English/Social Studies and Math/ Science.



Administration/Academic Organization/Structure

There is one principal and there are four assistant principals, each with approximately 400 students in their caseload. One assistant principal is assigned all students in the CVTE Engineering Program as part of his caseload along with a portion of the comprehensive school population. All other students are assigned alphabetically to the other assistant principals. These administrative offices are located in two areas of the building. Two assistant principals' offices are located on the first floor near the principal's office and the guidance office. Two other assistant principals' offices are located in a second administrative suite on the third floor in order to maximize effective supervision and safety procedures.

The vision for the new school is to place administrative offices for the assistant principals in locations that will support effective supervision of students and close proximity to programs within the school. Maintaining the current administrative suite format (two assistant principals in separate offices with a shared space for a shared administrative support personnel and supervised areas for students) in two areas of the school. These shared spaces need to have a designated place for meetings with students, parents, and counselors. Each individual office needs adequate space for meeting with students and parents and access to technology. An area designated for the administrative support personnel needs to have access to technology and serve as a welcome center for those visiting the administrative offices.

With the projected increase in enrollment and the expansion of course offerings in the new building there is a need to increase the number of assistant principals to meet the needs of the growing enrollment and the diversified programming including the additional vocational pathways, the Grade 9 teams and the Advanced Academy and to be more consistent with the district's administrator to student ratio. The administrative offices will need to be located throughout the "neighborhoods" to support the students and staff and to increase opportunities for collaboration. It is important that all leaders are also active learners and continuously seek to support and engage in professional learning communities and school wide improvement efforts along with the faculty. Additionally, at least one school adjustment counselor will have an office adjacent to each assistant principal pairing in order to support the district's focus on promoting student resilience and to support social-emotional learning and proactive problem solving. The increased community use of the new facility, coupled with the level of after school programming that will be afforded to the school community will result in the need for additional administrative coverage beyond the regular school day and the school year.

LPA|A Response: The Assistant Principal suites are strategically located within the academic wings for optimized student access and supervision. These suites include two assistant principals, an administrative office, a small conference room, and an Adjustment Counselor office.

Curriculum Delivery Methods and Practices

At Doherty Memorial High School, we believe in the 4 C's: critical thinking, communication, collaboration, and creativity and we have designed and implemented learning experiences for students that integrate all four of these areas, despite having a facility that does not support these activities in the manner in which it should. We also subscribe to the importance of rigor, relevance, and relationships. In our decennial report, the NEASC visiting team described the relationship between and among the adults and the students as a true strength of the school.

Teachers at Doherty Memorial High School employ a variety of instructional methodologies in their classes to deliver the curriculum. Guided by the Worcester Public Schools High Quality Teaching and Learning document they engage in practices that include whole-group and small group-instruction, modeling, and fostering opportunities for student-centered academic discourse and collaboration. The school is also guided by the Focus Statement and associated student-friendly strategy DHS SCORES (Decode- Read the question carefully, Highlight the tasks and terms, Stop-What is being asked?- Start to answer the question, Compile evidence and information, Organize your thoughts on paper, Respond thoughtfully in writing, Edit and review your work, Scoring higher equals success) to support critical reading and thoughtful writing in all classes across the curriculum. Teachers are increasingly integrating project-based learning into their curriculum to provide students with real-world learning experiences and to support college and career readiness. Programs such as the ETA regularly engage students in interdisciplinary learning activities that are highlighted during several learning fairs during the school year.

All classrooms and common spaces will enable staff, students, and outside personnel to utilize standard presentation and communication technology. Standard technology includes Epson bright link short throw projector, document camera, LED display is desired with screens that support both independent and mirroring displays; Chromecast/apple TV and speech reinforcement for classwork displays, announcements, etc.; standard Ethernet ports and wireless hubs providing varying degrees of access; and telephone capacity enabling calls between rooms along with connections to outside lines. These align with all stakeholder needs identified during the various listening and visioning sessions, including community members who imagine how outside organizations could benefit from the communal spaces.

LPA|A Response: Classrooms will be equipped with the required equipment and technology to deliver the educational program. Any district-standardized equipment that will require proprietary specifications (and local authorization) will be reviewed in Schematic Design.

English Language Arts

The mission of the English Language Arts program in the Worcester Public Schools is to provide a balanced approach to literacy to empower students to think critically and strategically, communicate effectively, and fully support arguments. Students read, comprehend, and critique a range of complex texts and media, write and present for various audiences and purposes, and develop habits of reading for enjoyment. This supports the school's focus to read critically and to respond thoughtfully in writing.

Doherty Memorial High School offers a variety of full year (1 credit) and semester (0.50 credit) courses in English Language Arts (ELA). The current 1-credit ELA course offerings include English I-IV, Academic Literacy I -IV, Journalism I-II, Advanced Placement English Language and Composition, and Advanced Placement (AP) English Literature and Composition. During the 2018-2019 school year, there were four sections of AP English scheduled, serving a total of 78 students. All are scheduled as a one-period block.

All students in the school are enrolled in an English course every year, as four years of ELA is a graduation requirement. Students may take additional ELA courses based on interest (Journalism, Creative Writing, Theater) or need (Academic Literacy). Creative writing is a semester-long, 0.50 credit course that was added to the course offerings during 2018-19. Theater I-IV has been a part of the ELA department in past years. There are plans to grow the theater program as part of the expanding performing arts program beginning in the 2019-20 school year with the addition of a dedicated full-time theater teacher. Additionally, as part of the Early College High School program (Appendix 2), the English department, in conjunction with Quinsigamond Community College will offer English 101/102 on the Doherty campus as an additional way to support college and career readiness and provide students with another opportunity to participate in more advanced coursework while earning college credits.

The English department has sixteen teachers and ten classrooms dedicated to ELA instruction. In total, these staff provided a combined 66 instructional periods of English and general electives. With only ten rooms available in the area designated for the English department teachers often have to travel between rooms for classes. Elective courses such as Journalism, Creative Writing and Theater are scheduled into available classrooms, and therefore are often located outside of the area of the building dedicated to the English department. For the 2018-2019 school year, these 10 'English' rooms had a combined usage rate of 94% (66 used periods out of 70 available periods). With the addition of new staff members next year, we will be faced with additional challenges when scheduling English classes within the current departmental space and will be forced to increase the number of teachers who need to travel to a classroom to teach.

Most of the ELA classrooms are not designed to effectively support a 21st century integrated humanities curriculum. The physical layout of these rooms discourages effective grouping practices, collaborative work, and flexibility. In addition, there were several other non-ELA classes scheduled into these rooms, due to the available space (e.g. Social Studies, World Languages). ELA classrooms are outfitted as general education classrooms, mainly comprised of a whiteboard and tablet-arm chairs. The available space in these rooms often make it difficult to arrange furniture to such classroom activities as whole-group Socratic Seminars or small-group project-based learning activities.

Curriculum in the ELA classes is delivered using a variety of instructional methodologies including but not limited to whole-group instruction and modeling and whole-group and small group discussion, and collaboration that supports the school's focus on reading critically and responding thoughtfully in writing using AP strategies, Self-Regulated Strategy Development (SRSD),and Advancement Via Individual Determination (AVID) strategies. Classes utilize technology in a variety of ways including the use of video and audio to support critical response, document cameras for modeling and collaboration, and Chromebooks (Chromecarts) for research, collaboration, writing, and publication. While collaboration and project-based activities are incorporated into the lessons in the ELA department, limited classroom and collaboration /break-out space can impact the ease and frequency of use of these activities. For example, when multiple classes have joined together to participate in station rotation activities, these classes have had to move to larger areas such as the cafeteria which provides more space and more flexible arrangement of furniture.

The vision for the English Language Arts department space in the new school includes maintaining the department structure for Grades 10 through 12 and includes classrooms of standard size with natural light and appropriate heat, cooling and ventilation and communication doors between rooms to support collaborations. There is a need for additional classroom and collaboration space to successfully deliver the ELA curriculum and grow the programs at Doherty Memorial High School. Collaborative space is needed to support increased opportunities for students to engage in the multi-stage/ multi-draft writing process and include opportunities for students and teachers to engage in conferring and collaborating as noted in the AP English Literature and Composition course description. Common areas within sightline of classrooms, designed to facilitate break-out sessions will support such opportunities and allow for shared presentations and collaboration among classes. This area needs to be able to the support distributive model for technology (Chromecarts) assigned to each room and opportunities for students to publish (both in print and digitally) and present materials. Additionally, these spaces will provide areas for Professional Learning Communities (PLCs) within the department to meet to collaborate. Within these collaborative spaces there needs to be an area dedicated to supporting professional learning, complete with areas for presentation and modeling classroom strategies.

As part of a humanities program, ELA classes and teachers will benefit from close proximity within the humanities neighborhoods and shared collaborative space with social studies and English Learner (EL) classes and teachers. This will foster cross-curricular collaboration and study as well as supporting interdisciplinary courses such as AP Research and AP Seminar (currently assigned to the social studies department). Such flexible collaborative space and cross-curricular sharing will allow for future expansion in these departments and allow the school to diversify and increase the elective course offerings in order to "foster deeper and broader subject matter exploration in areas relevant to student interests and societal needs" as indicated in the Worcester Public Schools' strategic plan (14.)

LPA|A Response: The academic pods are organized so that any department may be stacked vertically on two floors or in two adjacent pods. Each department includes (16) flexible classrooms and for general and special education, a Common Room, and a teacher planning space. The English neighborhood is located adjacent to the Social Studies department to facilitate cross discipline collaboration, and is in proximity to the Language cluster.

Mathematics

The mission of mathematics education in Worcester Public Schools is to provide opportunities for all students to interpret and persevere in solving real world, complex mathematical problems using strategic thinking. Students will be effective communicators and collaborators who construct viable arguments and critique the reasoning of others in order to make decisions, draw conclusions and solve problems.

The Massachusetts Frameworks for Mathematics guides the work of the mathematics department and supports the development of the Mathematically Proficient Person of the Twenty-First Century. This proficiency requires students who are college and career ready in mathematics to demonstrate the academic knowledge, skills, and practices necessary to enter into and succeed in entry-level, credit bearing courses in College Algebra, Introductory College Statistics, or other technical courses. These standards provide for a course of study that prepares students for a science, technology, engineering, or mathematics career by providing pathways for students who want to pursue a mathematics-intensive career or academic major after high school.

Students who meet the standards are able to identify problems, represent problems, justify conclusions, and apply mathematics to practical situations. They gain an understanding of topics and issues by reviewing data and statistical information, develop reasoning and analytical skills, and draw conclusions based on evidence. Students need to be provided multiple opportunities to discuss math's relevance to everyday life, their interests, and potential careers.

John Hattie's research has identified teaching problem-solving as being an effective hinge point (0.68) to accelerate student achievement. The creation of the mathematics classroom and collaborative space, coupled with the project-based learning opportunities afforded by the STEM/STEAM adjacencies listed above will allow us to better prepare each of our students to become the Mathematically Proficient Person in the Twenty First Century.

Doherty Memorial High School offers full year (1 credit) and semester (0.50 credit) courses. The current 1-credit course offerings include Algebra I, Algebra II, Geometry, Pre-Calculus, Calculus, Algebraic Reasoning, Numeracy, Statistics, and Topics in Algebra and Geometry. In addition, there are 0.50-credit offering in MCAS (Massachusetts Comprehensive Assessment System) Math. The Mathematics department currently offers three Advanced Placement courses: Calculus AB, Calculus BC, and Statistics. All are offered as a one-period block. During the 2018-2019 school year, there were three sections of AP mathematics scheduled, serving a total of 78 students.

All students in the school are enrolled in a math class every year and four years of mathematics is a graduation requirement. Students may take additional math courses based on interest (AP Statistics or Financial Literacy), or need (Numeracy, MCAS Math). There are plans to grow the mathematics program by offering courses as part of the Early College High School program in partnership with Worcester State University and/or Quinsigamond Community College. This will provide an additional way to support college and career readiness and offer students an opportunity to participate in more advanced coursework, while earning college credits. Students taking an Early College or dual enrollment course will either enroll in the course during the day in lieu of a regularly scheduled mathematics course, and/or these courses may be offered during non-school hours.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Currently there are eleven rooms predominantly utilized by the mathematics department. Six of these classes are located within the same hallway-referred to as the "math wing", one is located within the ninth-grade CVTE program area at the other end of the 300s floor, to allow for programmatic adjacency with other core academic courses in the ETA. The remaining four mathematics classrooms are located in other areas of the building, based on where rooms could be allocated to the department.

All rooms used for mathematics classes are outfitted as general education classrooms, mainly comprised of a whiteboard and tablet-arm chairs. The rooms assigned to the math department vary in size and seating capacity. Several rooms utilize a large table with chairs, as this furniture was repurposed from other areas within the school as the student population grew.

The school is built into a hill and as a result, many of the classrooms on the "hill side" of the hallway are below ground level, making them more difficult to heat given our current heating system and causing excessive condensation and dampness in the hot weather.

The vision for the mathematics department space in the new school includes maintaining the department structure for grades 10-12 and includes classrooms of standard size with natural light and appropriate heating. This vision also includes additional classroom and collaborative space to successfully deliver the mathematics curriculum and to grow the programs at Doherty Memorial High School. These classrooms should include flexible spaces that facilitate collaboration and that can adapt and be changed as the curriculum changes. They should include furniture that can be reconfigured for group work and projects rather than the lab tables that are in some of the classrooms.

Epson projectors with more than one display area should be in each math classroom to facilitate the use of technology and a Chromecart should be assigned in each of the classrooms. The classrooms need to be planned with this incorporation of technology in mind and placement should allow for ease of efficient access and flexibility to support a variety of presentation and collaborative experiences.

We anticipate adding space and staff to the math department due to the projected increase in enrollment and the addition of courses such as Financial Literacy and Advanced Quantitative Reasoning to our current course offerings. The district, and school, are seeking to add staff due to expected enrollment increases and due to expanded course offerings. Recent changes to Mass Core have increased graduation requirements which directly impacts course offerings. For example, four years of mathematics is now required for graduation and as a result, there is a need for additional staff in order to offer courses to meet this requirement. Consistent with the goals of the Strategic Plan for Worcester, additional staff is needed in order to expand and to diversify the current course offerings, and to expand the Advanced Placement program. An increase in staff will allow us to moderate class size to adhere to district staffing ratios and to better serve the needs of all learners. Collaborative space should exist within the department to support the work of the PLC's and to ensure horizontal and vertical articulation and alignment. Additional information regarding projected operating costs, including costs associated with increased staffing, will be included in the Capital Budget statement.

In order to support the advancement of STEM/STEAM programs, the math and science departments will benefit from close proximity and shared collaborative in the STEM/STEAM neighborhood facilitate teachers of the same grade across these departments to implement interdisciplinary project-based learning to demonstrate the relationship between the academic areas and for students to have their learning reinforced in multiple contexts.
This area will provide collaborative space for students to share information gathered and the analysis of the data for their projects and labs for their mathematics classes as well as to present the results of their research and/or lab findings. Such collaborative space and cross-curricular sharing will enable future expansion in STEM/STEAM departments and allow the school to diversify and increase course offerings to support both student interest and need.

LPA|A Response: The academic pods are organized so that any department may be stacked vertically on two floors or in two adjacent pods. Each department includes (16) flexible classrooms and for general and special education, a Common Room, and a teacher planning space. The Math neighborhood is located in proximity to the Science labs to facilitate cross discipline collaboration.

Science, Technology and Engineering

The Worcester Public Schools Science and Technology/Engineering (STE) program provides students with in-depth exploration of the standards identified in the Massachusetts: STE Curriculum Frameworks (2016). Support for classroom and after-school activities are enhanced through partnerships with area colleges and cultural, environmental, and scientific institutions. Doherty Memorial High School offers full year (1-credit) and semester (0.50-credit) courses. The current 1-credit course offerings include Biology, Chemistry, Physics, Biology II, Applied Physics: Introduction to Technology, Human Anatomy, and several non-vocational engineering-based courses taught by CVTE teachers. In addition, there are 0.50 credit offerings such as Forensics, an intensive Biology II course, and Environmental Science. The school also runs 5 AP science courses: Biology, Chemistry, Physics 1, Physics 2, and Environmental Science. All science courses have a laboratory-based curriculum.

The Science department currently offers five Advanced Placement science courses: Biology, Chemistry, Environmental Science, Physics 1, and Physics 2. Of these courses Biology, Chemistry and Environmental Science are each designed to be taught during a two- period block. During the 2018-2019 school year, there were eleven sections of AP science scheduled, serving a total of 275 students.

The curriculum in the Science department is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group instruction, modeling of strategies, procedures and experimentation, whole- and small-group

discussion, collaborative activities, project-based exploration of topics, laboratory experimentation, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Currently there are ten rooms predominantly utilized by the science department. Most of these classes are located within the same hallway, though two classrooms are located in different wings of the building. Of these designated science classrooms:

- two have functional lab benches with available sinks, gas, and electric
- six have some variation on lab benches/tables, with one functional sink. These lab benches/tables serve as both a lab surface as well as the students' desk spaces.
- two are outfitted similar to a regular education classroom, with no sink, gas, lab station/bench, or access to electrical connections.

There is a storeroom that has been converted and dedicated to a chemical storage room which also serves as a chemical preparation space. There are two storage rooms located near this chemical storage room: one is a stockroom for the majority of the biology and chemistry equipment, the other houses the materials for physics and the non-CVTE engineering/technology-based courses.

Most of the science classrooms are not designed to effectively support a 21st century STEM curriculum. Rather, most rooms just have rectangular lab tables, as opposed to tablet-arm desks, and a sink at the teacher's desk.

DMHS has a seven- period day, with no rotation or dropped periods. Each classroom is then available for use for seven periods each day. Therefore, there are 56 instructional periods available in a room outfitted to some degree to support a science curriculum, with another fourteen periods available for science staff, though situated in a general education classroom. This is a total of 70 available periods in a 'science' classroom.

During the 2018-2019 school year, there were thirteen FTE staff members providing a combined 65 instructional periods of science. In addition, there were several other non-science classes scheduled into these rooms, due to the available space (e.g. AVID). For the 2018-2019 school year, these ten 'science' rooms had a combined usage rate of 92.8% (65 used periods out of 70 available periods). With the addition of new staff members next year, including one in science, we will be over capacity and will hold more science classes in general education rooms.

The number of available classrooms, combined with their physical layout and available equipment, create deficiencies that challenge the department's attempted delivery of a 21st century STEM education:

- In order to run laboratory activities, teachers often have to switch rooms. For example, if a teacher needs to use a lab space with available electrical outlets, he/she must coordinate with the teacher assigned to that room and identify day(s) where the classes will switch rooms. This switching of classrooms/lab space has a negative impact on instruction as it detracts from effective use of instructional time. This change of classroom environment also disrupts established classroom routines and access to classroom materials.
- Given that each room is used by 2 or more teachers throughout the day, and given that most classes are structured with rectangular tables serving as both lab benches and student desks, teachers are forced to break down or move the lab equipment/class activity materials at the end of each period only to have to set them back up when their next class enters. Teachers cannot leave the activity materials on the lab benches/tables as these double as the desks for students. This creates a loss of instructional time.
- The physical layout and lack of available utilities negatively affect the range of laboratory activity offerings. Teachers are able to plan for a wide range of activities, but can only choose to practically implement a subset of these-a subset that aligns with the limitations of the available utilities.
- The classrooms cannot support a renovation. For example, additional electrical outlets cannot be installed into most classrooms due to the school infrastructure being unable to handle the added load.
- Safety equipment is dated and impractical. Two rooms have emergency showers and eyewash stations. Six have hoses that are coiled and located solely by the main door, often behind desks and lab tables. The regular education classrooms serving as science rooms have no safety equipment, and again staff and students need to move rooms in order to engage in science-based laboratory activities.

As we move into the future, and recognizing the growing importance of a STEM education in providing college and career readiness skills, Doherty Memorial High School needs a facility that enables students to rigorously and authentically engage with the Massachusetts Science Curriculum standards, including the acquisition and development of laboratory skills and practices. A 21st century science education will rely on technology, flexibility, classroom space for students to work collaboratively, and laboratory space designed for a range of curricular offerings. Flexible, yet separated, classroom and laboratory space enable educators to utilize a wide range of instructional practices, including but not limited to discussion groups, direct instruction, peer-to-peer collaboration, demonstrations, virtual simulations, laboratory investigations, inquiry-based learning activities, personalized groupings, individual work, etc. These flexible spaces will support several variations of organization to address current and future needs. This includes Grade 9 teams, with Grades 10-12 pairings between departments: for

example, the English and Social Studies departments would be paired, while Mathematics and Science would also form a departmental pairing.

Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

In 2018, the STEM Learning Design, LLC released a report outlining recommendations for the physical design and utilization of effective K-12 STEM learning spaces. Many of these recommendations have been adopted within recent new school designs, and the physical space considerations for science classrooms and associated spaces would likely adhere to the identified best practices within this report. For example, when designing the building space, Doherty would include such recommendations as ensuring that spaces 'support (a) comprehensive approach to health and hygiene as well as active STEM learning activities, including project-based learning.' (p. 19). Classrooms and associated spaces would include effectively designed storage options for student work, materials, classroom resources, etc.

LPA|A Response: For maximum efficiency in systems and structure, the Science labs are stacked vertically on three floors, with opportunities for vertical common rooms that connect these floor levels. The Science neighborhood also integrates a Biotechnology lab, special education classrooms, teacher planning space and central chemical storage. The Science Cluster is located in close proximity to the Math classrooms to facilitate cross discipline collaboration.

Social Studies

The vision of the 2018 Massachusetts Department of Elementary and Secondary Education Frameworks for History and Social Studies is that students will be "educated in the histories of the Commonwealth, the United States, and the world. They will be prepared to make informed civic choices and assume their responsibility for strengthening equality, justice, and liberty in and beyond the United States" (p.9).

Doherty Memorial High School offers a variety of full year (1-credit) and semester (0.50-credit) courses in social studies. The current 1-credit social studies course offerings include World History II, U.S. History I-II, Psychology, Sociology, Legal Aspects, Advanced Placement (AP) World History, AP U.S. History, AP Psychology, AP Human Geography, AP Government and Politics, AP Seminar and AP Research. Criminal Justice is a semester-long 0.50 credit course.

Students are required to take a minimum of three years of history/social studies classes in order to graduate, and all students in the school are required to take World History II, U.S. History I,

and U.S. History II Students may choose to take social studies electives and/or AP courses. Additionally, Students Involved in Their Education (SITE), a student internship program, has also been a part of the social studies department. Currently there are 10 rooms predominantly utilized by the Social Studies department. Eight of these classes are located within the same hallway-referred to as the Social Studies wing, and the other two are located within the ninth grade ETA program area. Teachers travel between classrooms during the day to teach their classes.

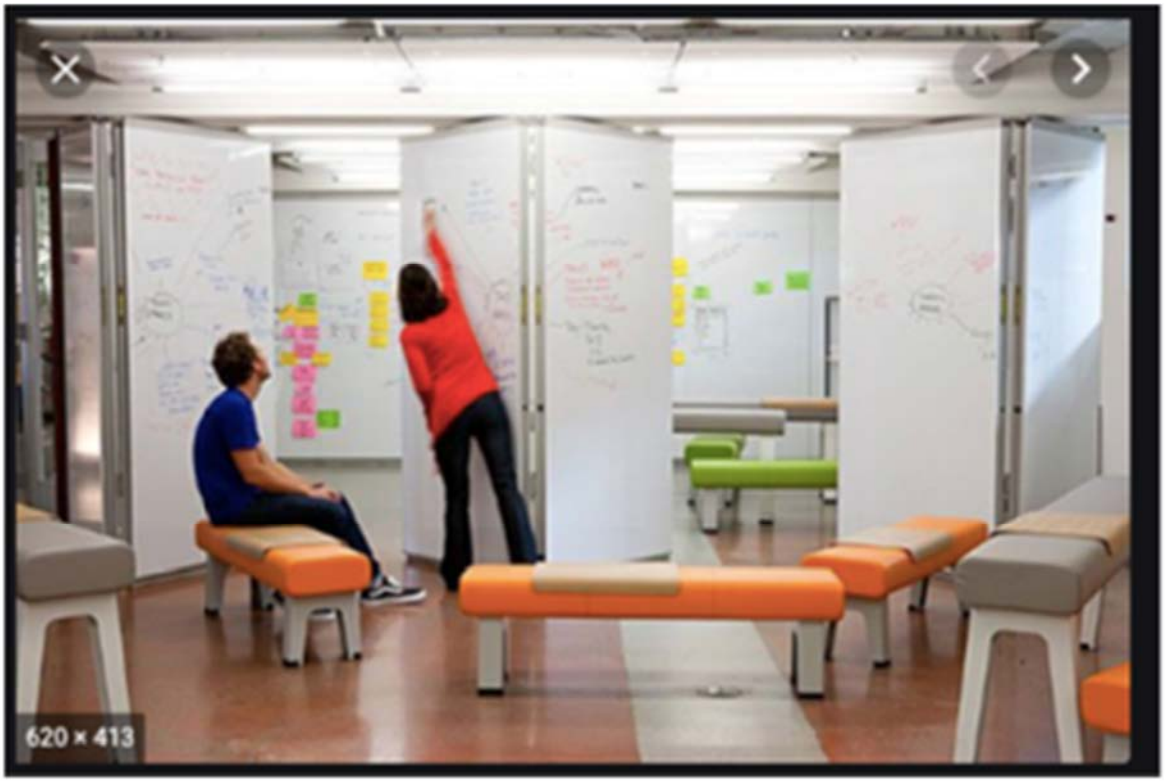
Each classroom is available for use for seven periods each day. Therefore, there are 70 instructional periods available in a room outfitted to some degree to support a social studies curriculum. During the 2018-2019 school year, there were 14 FTE staff members. Most teachers within the department provided social studies instruction, though several offered general, non-departmentalized elective courses as part of their assignment (e.g. AP Capstone courses, Internship Coordinator). In total, these staff provided a combined 66 instructional periods of social studies and general electives. In addition, there were several other non-social studies classes scheduled into these rooms, due to classroom availability at specific times of the day DMHS has a 7-period day, with no rotation or dropped periods. Each classroom is then available for use for 7 periods each day. Therefore, there are 70 instructional periods available in a room outfitted to some degree to support a social studies curriculum.

During the 2018-2019 school year, there were 14 FTE staff members. Most teachers within the department provided social studies instruction, though several offered general, non-departmentalized elective courses as part of their assignment (e.g. AP Capstone courses, Internship Coordinator). In addition, there were several other non-social studies classes (e.g. AP Capstone courses, Health, ELA) scheduled into these rooms, due to the available space. For the 2018-2019 school year, these 10 ‘social studies’ rooms had a combined usage rate of 97% (68 used periods out of 70 available periods). With the addition of new staff members to the department next year, and the addition of new courses, there will be a lack of available classroom space within the social studies wing, requiring classes to be scheduled in available rooms outside of the department area. As enrollment increases and the department continues to grow with additional staff and course offerings the school will be challenged to find appropriate classroom space to meet these needs.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, whole- and small-group discussion such as Socratic Seminars and debates, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis

Most of the Social Studies classrooms are not designed to effectively support a 21st century integrated humanities curriculum. The physical layout of these rooms discourages effective grouping practices, collaborative work, and flexibility. All are outfitted as general education classrooms, mainly comprised of a whiteboard and tablet-arm chairs. One classroom (409) is only 730 square feet.

The vision for the social studies department space in the new school includes maintaining the department structure for grades ten through twelve and having classrooms of standard size with natural light and appropriate heat, cooling and ventilation as conversational doors between rooms to support collaborations. There is a need for additional classroom and collaboration space to successfully deliver the social studies curriculum and grow the programs at Doherty Memorial High School. Collaborative space is needed to support increased opportunities to support students to "learn to think critically, construct solid arguments, and see many sides of an issue—skills that prepare them for college and beyond" (AP U.S. History Course and Exam Description p.1). Common areas within sightline of classrooms, designed to facilitate break-out sessions will support such opportunities and allow for shared presentations and collaboration among classes. This area needs to be able to support flexible use of technology (Chromecarts) and opportunities for students to publish (both in print and digitally) and present materials. Additionally, these spaces will provide areas for Professional Learning Communities (PLCs) within the department to meet to collaborate. These areas will allow for flexible orientations, and will have flexible furnishings to account for current and future needs. There are no specialized acoustical requirements beyond the acoustical classroom separations planned for the school. We anticipate using materials, for example whiteboard walls that pivot (see image below), that provide visual privacy when needed.



Within these collaborative spaces there needs to be an area dedicated to supporting professional learning, complete with areas for presentation and modeling classroom strategies. With the addition of an Internship/Community Service Coordinator position beginning in the 2019-20 school year, all student internships in the school will be developed and monitored by the coordinator and no longer supervised by a member of the social studies department as was the case historically. The coordinator will need a space to meet with students as a part of the new facility design.

As part of a humanities program, social studies classes and teachers will benefit from being in a neighborhood in close proximity and shared collaborative space with ELA and EL classes and teachers. This will foster cross-curricular collaboration and study as well as support interdisciplinary courses such as AP Research and AP Seminar (currently assigned to the social studies department). Such flexible collaborative space and cross-curricular sharing will allow for future expansion in the humanities departments and allow the school to diversify and increase the elective course offerings in order to “foster deeper and broader subject matter exploration in

areas relevant to student interests and societal needs" as indicated in the district's strategic plan (14.)

LPA|A Response: The academic pods are organized so that any department may be stacked vertically on two floors or in two adjacent pods. Each department includes (16) flexible classrooms and for general and special education, a Common Room, and a teacher planning space. The Social Studies neighborhood is located adjacent to the English Language Arts Neighborhood facilitate cross discipline collaboration, and is in proximity to the Language cluster.

World Languages

The goal of the Worcester Public Schools World Language program is to promote language proficiency in order for students to engage in meaningful communication and to appreciate cultures different from their own. This program is founded on the belief of the Massachusetts Common Core of Learning that all students should converse, read, and write in at least one other language in addition to English.

The mission of the World Language department states that at every level of world language instruction, students communicate will communicate in the interpretive, interpersonal, and presentational modes in the target languages. Students will gain an understanding of the target language and target culture by making comparisons and connections to their own language and culture and apply the skills and knowledge acquired in future career and life experiences.

Students must successfully complete two years of the same language in order to graduate from the Worcester Public Schools, with the exception of vocational students and some students with disabilities if their Individualized Educational Plan is written with that exception.
Doherty Memorial High School offers a variety of full year (1 credit) courses in World Languages including French I-IV, Latin I-IV, Spanish I-IV, Spanish Native Speaker, and Advanced Placement Spanish Language.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies and oral and written use of the target language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to research the culture and history of the countries associated with the target language and to practice speaking and listening skills using Audacity, a multi-track audio editor and recorder. While this is the goal in all classes in this department, limited

classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Currently at Doherty, world language courses are taught in seven classrooms, five of which are located in the world language wing on the fourth floor and two located in close proximity on the fourth floor. Prior to 2018-19, room 422 was a dedicated space, akin to a Global Learning Lab, used as a language lab for the World Language department. This space contained desktop computers and provided opportunities for classes to use Audacity program to support their speaking and listening skills in their target language. The desktop computers included specialized software to enable students to integrate technology as they engaged with the curriculum. Students were using the distributive technology to research the culture and history of the countries associated with the target language, to practice their speaking and listening skills using a multi- track audio editor and recorder computerized program, and to practice for and ultimately take the speaking component of the Advanced Placement Language (Spanish) exam.

Unfortunately, due to the overcrowding issues at the school this space has been converted to a classroom beginning in 2018-19 and is now used by various departments to provide much needed classroom space. While the loss of the Global Learning (computer) lab was offset by the purchase of Chromebooks, the Chromebook technology – due to software and hardware incompatibility – is not sufficient to enable all necessary curricular activities to occur.

The vision for the World Language department space in the new school includes maintaining the department structure and includes classrooms of standard size with natural light and appropriate heat, cooling and ventilation as conversational doors between rooms to support collaborations. There is a need for additional classroom and collaboration space to successfully deliver the World Language curriculum and grow the programs at Doherty Memorial High School. Collaborative space is needed to support increased opportunities for students to engage in speaking and listening activities such as plays, presentations, and cultural activities.

Common areas within sightline of classrooms, designed to facilitate break-out sessions will support such opportunities and allow for shared presentations and collaboration among classes. This area needs to be able to support flexible use of technology (Chromecarts) assigned to each room and opportunities for students to publish (both in print and digitally) and present materials. These areas will allow for flexible orientations, and will have flexible furnishings to account for current and future needs. There are no specialized acoustical requirements beyond the acoustical classroom separations planned for the school. We anticipate using materials, for example whiteboard walls that pivot, that provide visual privacy when needed. Additionally, these spaces will provide areas for Professional Learning Communities (PLCs) within the department to meet to collaborate. Within these collaborative spaces there needs to be an area dedicated to

supporting professional learning, complete with areas for presentation and modeling classroom strategies.

Effective foreign language programs integrate the study of language with the study of culture which includes daily life, history, literature, visual and performing arts, mathematics, and science. In this way, foreign language programs create natural links to all other disciplines. As part of a humanities program, World Language classes and teachers will benefit from close proximity to the departments in the humanities. This will foster cross-curricular collaboration and study as well as supporting interdisciplinary courses.

The vision for the new school also includes expansion of the course offerings to include AP Spanish Literature and restoration of the Global Learning Lab to this department. A dedicated Global Learning lab, utilized primarily by the World Languages department, will provide increased opportunities for students to enhance their speaking and listening skills in their target language. If available, other classes requiring the available technology could certainly benefit from this space. The World Language Department Chair will be responsible for maintaining the schedule and coordinating the logistics of use of the space.

The world language teachers work to effectively meet the needs of our diverse community of learners using various instructional and assessment practices as they provide differentiated support to those who are new to the study of World Languages, Native Speakers and AP students alike. The addition/replacement of the language lab will greatly support their valiant efforts and help us celebrate the diversity of our community and as we learn about other cultures. The lab will be staffed by licensed teachers and the department chair will oversee the scheduling of the lab.

The use of student-centered Global Language lab activities and assessments supports the gradual release of responsibility as students develop target-language proficiency and confidence through authentic listening activities, listen and respond recording tasks, pair dialoguing, and interactive web-based activities. The lab will allow students to record and listen to themselves speaking in the target-language so they can learn to self-evaluate and self-correct. Students will have the opportunity to participate in engaging, project-based learning activities such as presentations, plays, and video projects.

The restoration of the Global Language lab will support student fluency essential for preparation for the AP exam earning the Seal of Biliteracy. The State Seal of Biliteracy is an award provided by state approved districts that recognizes high school graduates who attain high functional and academic levels of proficiency in English and a foreign language in recognition of having studied and attained proficiency in two or more languages by high school graduation. The vision for awarding this seal is to help students recognize the value of their academic success and for see

the tangible benefits of being bilingual as is benefits college and career readiness. The MA Seal of Biliteracy, adopted from the state, takes the form of a seal that appears on the transcript and diploma of the graduating senior. This recognition may be presented to colleges and future employers.

Increased opportunities for student achievement and for students to take increased responsibility for their own learning are consistent with the emphasis on the gradual release of responsibility for students as they move through the years and is consistent with the skills needed for them to be lifelong learners.

LPA|A Response: The World Language classrooms are clustered together in close proximity to the Social Studies and English Language Arts neighborhoods. The Language neighborhood includes two language labs, a common room and teacher planning space.

English Learner Classes

The English Learner program in the Worcester Public Schools supports the implementation of Sheltered English Immersion with fidelity to promote English language acquisition by acceleration for all English learners in the district and to bring the opportunity of bilingualism/multilingualism to as many students as possible.

Doherty Memorial High School serves a diverse population of students who represent a range of native languages.

Table 7

2019-20 Student Counts by Native Language, ELL numbers		
Native Language	Students	ELL Students
English	709	0
Spanish	361	170

Albanian	88	7
Vietnamese	56	3
Twi	45	17
Arabic	41	24
Portuguese	34	18
Miscellaneous languages	29	6
Nepali	18	8
Swahili	17	8
Greek	12	0
French Patois	7	0
French	6	2
Russian	5	1
Rundi	5	2
Somali	4	2
Creoles & Pidgins (French)	4	2

Polish	3	0
Khmer/Khmai	3	0
Faroese	3	1
Haitian French Creole	3	3
Armenian	2	0
Kinyarwandu	2	1
Kongo	2	2
Ewe	1	0
Amharic	1	0
Urdu	1	0
Undetermined	1	0
Chinese	1	0
Tigrinya	1	1
Slovenian	1	0
Sango (Ubangi Creole)	1	1

Philippine (Other)	1	1
Persian	1	0
Ga	1	0
Ganda	1	0
Niger-Kordofanian (Other)	1	0
Creoles & Pidgins (Portuguese)	1	0
	1473	280

Doherty Memorial High School offers a variety of full year (1 credit) courses that support English Learners in an effort to support English language acquisition. The English Learners department has three teachers who provided a combined 15 instructional periods of language development and only two classrooms dedicated to EL instruction with one classroom on the fourth floor and one on the third floor. Teachers must travel between rooms for different class periods. DMHS has a seven- period day, with no rotation or dropped periods. Each classroom is available for use for seven periods each day. Therefore, there are 14 instructional periods in the designated EL classrooms. During the 2018-2019 school year, these two 'EL' rooms had a combined usage rate of 100% (fourteen used periods out of fourteen available periods). In addition, there were several other non-departmental classes scheduled into these rooms, due to the available space (e.g. Social Studies, ELA, Science). With the increasing enrollment of EL students, additional space is needed to provide instruction to support English language acquisition.

The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners as they develop English fluency. Instructional methods include whole-and small-group - instruction, modeling of and oral and written use of the English language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills While this is the goal in all classes

in the ELL department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Neither English Language Learner classroom is designed to effectively support a 21st century language development curriculum. The physical layout of these rooms discourages effective grouping practices, collaborative work, and flexibility. Both are laid out as general education classrooms comprised of a whiteboard, and tablet-arm chairs.

Curriculum in the EL classes is delivered using a variety of instructional methodologies including but not limited to whole-group instruction and modeling, and whole-group and small group discussion and collaboration that supports the school's focus on reading critically and responding thoughtfully in writing. Classes utilize technology in a variety of ways including the use of video and audio to support critical response, document cameras for modeling and collaboration, and Chromebooks (Chromecarts) for research, collaboration, writing, and publication. The school works to advance the mission of the Worcester Public Schools Office of English Learners "to support the implementation of Sheltered English Immersion with fidelity to promote English language acquisition by acceleration for all English learners in the district and to bring the opportunity of bilingualism/multilingualism to as many students as possible."

The vision for the English Learner department space in the new school includes additional classroom and collaboration space to successfully deliver the EL curriculum and grow the programs at Doherty Memorial High School to meet the needs of the many English Learners in the school. Collaborative space is needed to support increased opportunities for students to work in peer groups and in small groups with a teacher to engage in academic discourse, reading, writing, and presentations to support their language acquisition. Students will benefit from close proximity to the core academic classrooms/neighbors to allow for shared collaborative space and opportunities for modeling, EL support and which will help to increase equity and access to other courses in all core academic departments.

LPA|A Response: The EL classrooms are clustered together in central location within the academic area, readily accessible from the academic neighborhoods. It is anticipated that the EL program could share some common spaces with the World Language neighborhood.

College and Career Readiness

Beginning in the 2018-19 school year all grade 9 students are required to participate in a ten-week course focused on college and career readiness, earning 0.25 credit upon successful completion of the course. The lessons in the Introduction to College and Career Readiness course incorporate lessons from Naviance and are designed to assist students in creating and maintaining a plan for their individual and personal educational plans or MyCap. The lessons include time-management exercises, self-awareness activities, interest inventories and college and career exploration lessons.

Beginning in the 2019-20 school year, all grade 10 students are required to participate in College and Career Readiness II and will earn 0.25 credit upon successful completion of the course. The lessons for the tenth-grade students represent a continuation of the introductory course and increase the breadth and depth of these exploration activities and support the further development of their individual plans for high school while increasing each student's knowledge of postsecondary options based upon their career interests.

LPA|A Response: A College and Career Center is included in the space summary, and is located in a central location near the Guidance Suite and Media Center.

Academic Support Programming Spaces

Doherty Memorial High School provides a variety of academic support programs for students during the school day as well as after school and on Saturdays. Students enrolled in the courses such as Academic Literacy, Numeracy, AVID, and Study Skills participated in these classes during the school day. After-school classes and Saturday workshops are available throughout the year and to support students to prepare for the English, Math, and Science MCAS exam. Additionally, AP students participate in Saturday practice exam sessions at different points in the year to help them prepare for the end-of course AP exam.

Academic Literacy

Academic Literacy I-IV is offered to provide a double dose of English to support students with identified needs. In this course, offered through the ELA department, students learn to appreciate the varied reasons for reading; discuss texts as a community of readers; and apply comprehension strategies to academic texts. Students engage in activities that increase or improve reading comprehension, reading technique, vocabulary acquisition, and general literacy skills.

These classes are currently taught by members of the ELA department and are located in the ELA wing, as space allows. The vision for the new school is to continue to offer these classes in

grades 10-12 ELA neighborhood and to locate Academic Literacy I classes in or within close proximity to the Ninth-Grade Academy.

LPA|A Response: The ELA neighborhood classrooms will be flexibly equipped to support the Academic Literacy program.

Numeracy

Numeracy is offered to provide a double dose of math to support students with identified needs. In this course, offered through the Mathematics department, students strengthen foundational math skills and increase their understanding of Algebra I by addressing properties of rational numbers (i.e., number theory), ratio, proportion, estimation, exponents and radicals, the rectangular coordinate system, formulas, and solving and graphing linear equations and inequalities.

These classes are currently taught by members of the Mathematics department and are located in the Mathematics wing, as space allows. The vision for the new school is to continue to offer these classes in the Mathematics neighborhood as well as within close proximity to the Ninth-Grade Academy.

LPA|A Response: The Math neighborhood classrooms will be flexibly equipped to support the Numeracy program.

Advancement Via Individual Determination (AVID)

The Worcester Public Schools supports the implementation of AVID's (Advancement Via Individual Determination [AVID])mission to close the achievement gap by preparing all students for college readiness and success in a global society. Doherty Memorial High School offers full year (1 credit) and a semester (0.50 credit) courses Advancement Via Individual Determination (AVID) Elective course. AVID I-IV are 1 credit courses and AVID 1 Pt. 1 is a 0.50 credit course. Most students enter the high school AVID program in the ninth grade and stay in the program through graduation.

AVID supports students who are motivated and have the desire to excel and attend college but need additional support (academic, social, and emotional) to prepare them to be college and

career ready. Many of the students are the first in their family to attend college and/or are members of groups that are often underrepresented in higher education. Students in the AVID program participate in the AVID Elective course each year. During the 2018-19 school year the semester-long AVID 1 Part 1 course was offered in order to provide these valuable academic and collaborative skills and supports to students who are not in the AVID Elective courses/AVID program (AVID).

Collaboration and the ability to utilize flexible grouping is an essential part of the AVID curriculum. "Students would rather talk, move around, and ask questions than sit still and be quiet. Humans are wired to construct knowledge through action. AVID classrooms promote motion, communication, and team building through activities such as Socratic Seminars, Collaborative Study Groups, peer tutoring, and Philosophical Chairs. These activities honor the way students learn best" (AVID).

Each week, AVID Elective students participate in collaborative study sessions (tutorials) in which they use critical thinking, collaborative inquiry, and academic discourse skills to explore and solve Points of Confusion (P.O.C.) from different academic content areas. Students receive additional support during this process from AVID tutors. These tutors are community volunteers. Generational tutors are community members, often retirees, who volunteer their time and their expertise to help guide students through the tutorial process. In addition, AVID programs in the district partner with colleges in Worcester and to provide additional tutors to support AVID students. This combination of tutors provides students with varying perspectives and the opportunity to interact with members of our community.

The AVID program requires and benefits from community-based tutors. Like all other visitors, these tutors will be permitted access to the building through our main office entry and will be permitted access to the AVID classroom only. The school currently implements protocols regarding visitor access, including parent/guardian(s) and other community members. These protocols limits visitor access to the room (office, classroom, etc.) applicable to their visit only.

In addition to classroom space for whole group instruction and frequent guest speakers, the AVID classroom is arranged to provide small group collaborative work areas in order to support the tutorial process every Tuesday and Thursday, the current classroom configuration limits the ability to successfully create these collaborative spaces. Students currently use small white boards to present their P.O.C. and furniture must be rearranged for each group for each session. The AVID curriculum also includes instructional methodologies that promote reflective academic discourse and AVID classes frequently participate in activities such as Socratic Seminars, Philosophical Chairs, Gallery Walks and other whole-class participatory activities. An

additional part of the AVID curriculum includes collaborative team building activities that often require space for student participation.

The vision for the AVID program space in the new school includes collaboration space to successfully deliver the AVID curriculum and grow the program at Doherty Memorial High School. Currently, there is only one designated classroom AVID classroom and due to the lack of available classrooms in the current building, there is a need to schedule other classes in the room when there is not an AVID class. This posed a challenge when the opportunity arose to add a section of AVID I Part 1 second semester and as a result of previous classroom scheduling this class this had to be placed in a science room that lacked appropriate spaces for the collaborative process. In order to successfully engage in collaborative inquiry, students need space to gather in small groups with tutors (the ideal student: teacher ratio is 7:1) complete with access to technology and white board space to post P.O.C.s and work through the tutorial process. Ideally, the AVID program would like to be able to serve at minimum, ten percent or our school population. The current lack of space impacts the ability to expand the program and to offer additional sections of AVID (Table 8). The ten percent of Grade 10 students served in 2019 is reflective of the addition of the AVID 1 Part 1 course but the students in that course had limited collaborative space. Only 51% of the Grade 10 students in AVID classes (either AVID II elective or AVID 1Part 1) were able to participate in AVID in a classroom with at least limited collaborative space.

Table 8

PERCENTAGE OF ALL STUDENTS IN EACH GRADE AT AVID SCHOOLS, ENROLLED IN THE AVID ELECTIVE

	9th Grade	10th Grade	11th Grade	12th Grade
2019	7%	10%	6%	5%
2018	7%	7%	6%	7%
2017	7%	7%	6%	6%

AVID strategies are not limited to the AVID Elective class. “The power of AVID Secondary is the ability to impact students in the AVID Elective class *and* all students throughout the campus. AVID Secondary can have an effect on the entire school by providing classroom activities, teaching practices, and academic behaviors that can be incorporated into any classroom to improve engagement and success for all students. Teachers can take what they've learned at AVID training back to any classroom to help all students, not just those in AVID, to become

more college- and career-ready"(AVID). This link between AVID and professional learning opportunities for staff necessitates areas for collaboration, modeling, and access to the AVID library and resources for all staff members including members of the AVID Site Team. The ideal space would allow for space for modeling and co-teaching opportunities to support gradual release and effective utilization of AVID strategies to support academic success and promote college and career readiness.

LPA|A Response: One AVID classroom will be centrally located to provide efficient access from the academic neighborhoods.

Study Skills

Study Skills classes are offered through the Special Education Department to support students with identified needs. These year-long courses are taught by members of the Special Education department. (See full description in Special Education section.)

Student Guidance and Support Services

The mission and purpose of the Worcester Public School Guidance Counselor Department is to advocate for every student and provide a comprehensive guidance program that will assist all students in acquiring the knowledge and skills needed to become career and college ready. The program is based on the Massachusetts Model for Comprehensive School Counseling. School counselors take a systematic approach to deliver a standards-based curriculum to all middle and high school students through individual counseling, small group counseling and classroom guidance lessons to facilitate student learning and development in three domains: personal/social development, academic/technical achievement, and workplace readiness/career planning.

The Guidance Department houses staff members who provide a variety of support services to our students. In past years, Doherty has had five guidance counselors. Beginning in 2019-20, there will be six guidance counselors at DMHS to meet increasing enrollment and growing student need and to bring us closer to the American School Counselor Association and the Massachusetts School Counselors Association recommended ratio of students to counselor of 250:1. The number of guidance counselors will likely increase due to the projected increased enrollment in the new facility. These counselors work with students and their families to evaluate academic needs, refer students for evaluation and identify appropriate academic support, provide social/emotional information and provide short and long term counseling/support, communicate with families and assist with facilitating school-to-home/home-to-school communication, and support college and career readiness preparation.

Doherty has two full time school adjustment counselors, and one part-time school adjustment counselor who focus primarily on providing short- and long- term counseling and crisis intervention for students, act as liaisons between parents, students, and teachers regarding student needs, referring students for community-based mental health and counseling services, and monitoring student attendance. Additionally, there is a school psychologist whose responsibilities center on the assessment of students' academic, social-emotional and behavioral needs, communication with parents and community providers regarding student needs, and providing consultation to teachers and administrators regarding student needs.

Guidance counselors meet in both large and small groups in academic classrooms and in the Guidance Conference room to discuss topics related to college and career readiness. Counselors utilize Naviance, a college and career readiness program that allows students to create a personalized plan that helps them make the right decisions throughout their academic journey, as a tool which provides parents and students access to the portal.

The current Guidance Office has a counter in front of the guidance secretary's desk. The guidance secretary serves as a greeter for the department welcoming students, parents and college/career representatives, handles all incoming phone calls, helps to schedule appointments and visits in the office and organizes and tracks both current and past student cumulative records. Doherty also serves as the repository of the school records/transcripts for both Classical High School (the predecessor of Doherty Memorial High School) and Commerce High school. These older transcripts/records are currently housed outside of the Guidance Office, in the office of the Instructional Coach.

The central part of the Guidance office also contains a small conference table which serves as a waiting area for students, parents, and other visitors. Currently there are six private offices in this area that are used for three of the guidance counselors, the two school adjustment counselors, and the MassEdCo representative who is assigned to our school to work with students and families to support the college application and financial aid process. There is a small work area behind the guidance secretary that is used for guidance -related materials and the photocopier for the department. This is also used as access to the head counselor's office. The other two guidance counselors have offices in the guidance conference room. These offices have portable walls and do not allow for private meetings with students or parents. The conference room contains tables, arranged in an oval, and seating for fifteen people. This area is used for presentations, meetings with college/career representatives, parent meetings, and as a student workspace. While this space is flexible, it is not adequate for many of its intended uses. This conference area does not provide private/confidential space for meetings with parents or specialists. For example, Individual Education Plan (IEP) meetings, which involve Special Education staff, guidance counselors, administrators, and other support staff, are held in the

conference area in room 309 (the administrative suite that houses two of the assistant principals' offices) because it ensures more privacy.

The space is not large enough for many of the college/career presentations that need to be scheduled or for whole-class lessons with guidance counselors. Additionally, there are no other spaces for teachers to meet with parents or to make phone calls to parents that provide privacy. This area is often used with students to engage in online college/career exploration utilizing Naviance or work on PLATO (online credit recovery program). With the addition of office space for the sixth guidance counselor beginning in August 2019, there will be even less space available for these purposes.

The vision of the Guidance Suite for the new school is to provide a central location for information, college/career explorations, advising and support. The vision for the Guidance and Support Service Office space in the new school includes private office space, classroom, meeting and collaboration space and a career center to successfully support student needs and provide programs to foster college and career readiness. The proposed Guidance Suite would benefit from proximity to the main entrance for ease of access to the office and services by families, college/ career representatives, and other support service providers. Additionally, adjacency to the other administrative offices will facilitate collaboration among different student supports.

This proposed Guidance Suite will include a welcome center within the front part of the suite with space for the guidance secretary to greet visitors, answer questions, and direct and monitor the flow of phone calls and foot traffic through the office. There is also a need for a waiting area with ample room to accommodate students, college/career representatives, and families. There is a need for flexible collaborative space that can be used for small- group meetings such as enrolling new students or parent-teacher conferences.

Each counselor will need an office which can allow for private meetings and be large enough to include students, parents, appropriate students support personnel, and an interpreter. While there will be six guidance counselors beginning in 2019-20 school year, the office needs to be flexible to accommodate any increase in staff that may be needed to support any increase enrollment and to allow the counselors to stay within the 250 : 1 ratio as recommended by Massachusetts Model for Comprehensive School Counseling.

Private meeting space is an essential part of the Guidance Suite in order to provide emotional safety for students and allow for confidential meetings with students, parents and support personnel. Flexibility within this suite will allow for expansion of these roles should they been required to meet student needs and enrollment. Additional private office/meeting space is needed

for programs such as MassEdco which provides college and financial aid counseling to students and families.

The suite needs to be designed in a way that it promotes a sense of emotional security and is a safe space for all students with ease of access to counselors, resources and a place where they can regroup and refocus within visibility of counselors.

Flexible conference/collaborative space is needed for meetings and presentations by college/career representatives; a large conference room/presentation space with seating for 30-40 people and a smaller conference room/presentation space with seating for twenty people. Each space should be equipped with whiteboards, projectors and other appropriate technology. This space can also be used as instructional space to support the delivery of the curriculum as recommended in the Massachusetts Model for Comprehensive School Counseling.

During the course of the day, there is a need for multiple meeting spaces to accommodate the range of presentations that can occur simultaneously. Colleges visit the school and host information sessions for students during the school day. A large conference room which can accommodate 30-40 people will allow for these types of informational and instructional sessions within the school day. Additional group meetings such as IEP meetings, and team meetings such as the Graduation Improvement Team, Attendance Team, and the Instructional Leadership Team, meet throughout the day. These groups require a private meeting space that can accommodate these groups, which often have 15-18 members. Two separate conference rooms/meeting spaces will allow for these programs and meetings to occur simultaneously without limiting the instructional/informational opportunities for students. Due to current limitations, Doherty often does not host district-level professional development or district-based administrative meetings: flexible and variable conference and presentation space will allow Doherty to benefit from visitors and trainers.

When considering the use of these proposed spaces, and possibilities for shared usage, it was determined that the Guidance department can utilize the Career Center space for the 30-40 person meetings, but will require a smaller private conference space for 15-18 people. This will be reflected in the updated PSR Space Summary.

In all spaces, there needs to be reliable and consistent access to technology not only in each individual office area but throughout the entire suite to support the use of technology for activities such as MyCap (My Career and Academic Plan) and Naviance to support academic and career planning process, and PLATO. The suite needs to include space with easy access to resource materials for students and access to technology/printing for applications, resources, and other similar materials.

Currently, many Doherty students participate in work-experience or internship placements. Doherty is planning for a dedicated space, designated as a Job Placement Office, for the staff member assigned to assist these students in their off-site placements, as well as to liaise with community members working with Doherty students. Doherty currently offers several credit-earning options for non-vocational students and so this office space is not intended exclusively for the Chapter 74 programs. For example, the SITE program (Students Involved in Their Education) allows students to leave school at the end of the day to participate in an unpaid internship within a local business or organization. Students with a job who complete certain requirements are eligible to earn credit and many of them work to help to support their families. The Job Placement Office established a common location for students, staff and community members to access information about these options and to utilize the support provided.

Students within the vocational programs participate in internship opportunities independent of the SITE or Work-Experience programs.

The Guidance Suite needs space dedicated to safe and secure storage of student academic records, including the repository of records that need to be stored and accessible at the school. The school is a repository for school records for Doherty, Classical High School (the predecessor of Doherty) and Commerce High School. In keeping with the intent of 603 CMR 23.06, the time limit for destruction of the record should probably be not less than sixty years and therefore appropriate safe space to archive these records needs to be included in the Guidance Suite.

LPA|A Response: The Guidance Suite is centrally located, and includes a waiting area, private Guidance Counselor offices, a dedicated conference room, a College and Career Center and storage. Satellite offices for the Adjustment Counselors are located strategically throughout the academic wings to maximize student accessibility and supervision.

Student Support

Health Center

The Worcester Public Schools partners with Family Health Center to operate a School Based Health Center at Doherty Memorial High School. As noted in the Family Guide and Community Resources document (Appendix D) “Health Centers are staffed by agency personnel as well as a WPS School Nurse and School Adjustment Counselor. The School-Based Health Centers

provide students with necessary health care: physicals for school, work or sports; treatment of illness; first aid; emergency care; immunization and/or health education. In order to receive services from the partner health order to receive services from the partner health agency at the school, parents/guardians must complete and return to school a signed enrollment form. This is available at the school. When appropriate, health insurance companies of the families will be billed. No one will be denied services if unable to pay" (Family Guide and Community Resources, 2017, p.18).

Currently, the health center is staffed by two nurses and the School Based Health Center is staffed by a nurse practitioner, an administrative assistant and a behavioral specialist. The area within which they work is not large enough to adequately support this important function a school as large as Doherty. There is no private waiting area for students who are waiting to be seen by either one of the nurses or the nurse practitioner. There is insufficient space for the school nurses to make phone calls to parents or agencies about student's health issues. There are only two exam rooms and they are quite small in size with inadequate storage for medical supplies. The nurse practitioner, who is employed by Family Health, faces similar situations as she has only one small exam area within which to work and an office that barely fits one person. Despite these crowded conditions, during the 2018-19 school year, the staff of the health center saw and treated 1,253 students at least one time and the School Based Health Center, SBHC, staff had 4,000 visits, 3,100 for medical issues and 900 visits for behavioral health reasons and involving 398 students. During the 2018-19 school year, there were 750 students at the school who were members of the health center which represents nearly 50% of the school population.

The school nurses' responsibilities are extensive. They administer medication, evaluate students and staff who visit the health center, triage illnesses, injuries and health concerns and respond to medical emergencies throughout the school. The school nurses provide screening for height, weight, and BMI, vision and hearing, and they engage in Screening, Brief Intervention and Referral to Treatment (SBIRT), an evidence-based practices used to identify, reduce and prevent problematic use, abuse, and dependence on alcohol and illicit drugs. The nurses conduct these SBIRT screenings in the hopes of referring students who may be experimenting with drugs, alcohol, and/or have mental health issues to intervention programs. The school nurses collaborate with the district nursing department, other healthcare providers, and families to address the physical and mental health needs of our students.

The nurse practitioner provides additional treatment to students who are members of the School-Based Health Center, SBHC. She also works with families and other health care providers to meet the needs of our student population by conducting annual physicals to students and treating a variety of conditions. The behavioral specialist also employed by Family Health works collaboratively with our staff and students to help to address the mental health needs of health

center members. The nurses and the SBHC staff maintain records and complete injury reports and other documentation to support our student's health and wellness.

The vision for the new school is to provide ample space for three nurses and the SBHC staff to complete their work. Due to the increased enrollment and the extensive use of this space, the number of nurses will increase from our current staffing of two to three. This area would include adequate exam room space, a waiting area that is large enough to avoid the spreading of germs, office space to be able to communicate with parents and providers while maintaining and respecting confidentiality and privacy issues about student's health issues and a small conference room to meet with families to discuss medical issues privately, and to be able to provide small group therapy and a lactation space for nursing mothers. Additionally, an increased number of bathrooms, including one to gather specimens, and one that includes a shower. This space should include a larger resting area, a break area for any student who needs to relax or those who may be dysregulated, and a space for diabetic students to test and to eat if need be according to their levels. There also needs to be a sufficient office for the administrative assistant to support the work of the nurse practitioner and multiple exam rooms for the nurse practitioner to treat students who are members of the center. The behavioral specialist needs a space to be able to meet with students that is large enough to support counseling services, to provide urgent mental health evaluations and to support ongoing therapy. There is also a need for additional storage in the health suite for medical supplies.

Additionally, despite our best-efforts to treat students at school, there are certain situations that warrant calling 911 and having our students transported to the hospital for more care and therefore, we request that there be access to the outside of the building that is handicapped accessible and near a driveway in order for Emergency Medical Services to be able to transport these acute cases of medical need to the hospital without having to travel with students on a stretcher and/or wheelchairs throughout the building. The nurse's suite and the gymnasium are areas that these types of emergencies seem to occur more frequently. An exterior entrance will also support the SBHC being accessible after school hours and possibly to other family members of our students and other members of the community should this expansion occur. There is a need for space in the health suite to incorporate a food pantry and a clothing outlet to better meet the needs of our students and their families. Historically, all clothing donations have been kept in an area of the guidance office and students have accessed a variety of clothing items for themselves and for their families. This space has been limited to one wardrobe closet. The adjustment counselors have distributed food and grocery gift cards to families particularly during the holidays but there is a need for a more consistent provision of food items than we have been able to address. In the new school, we envision a space for food and clothing distribution as a part of the health center. These areas will be maintained by our community partners, staff donations and service-learning initiatives.

LPA|A Response: The proposed medical suite includes individual and shared spaces for both the Doherty school nurses as well as the School Based Health Center. The medical suite is located adjacent to the main entrance, with direct exterior access to allow for secure operation after school hours.

E. Teacher Planning

Each teacher is scheduled for one preparation period each day. This provides teachers with the opportunity to design materials and plan instruction to support the delivery of the curriculum in accordance with DESE curriculum frameworks. Teachers utilize ATLAS, the district's online platform which provides access to curriculum frameworks, curriculum maps, curriculum resources, and other course-specific information to help with this work. In order to access ATLAS and to facilitate instructional planning teaches need a dedicated space with access to technology and other professional learning materials/supports. Currently there is a teacher workroom on the third floor which has a worktable for individual and collaborative work, as well as access to a telephone for teacher use. This workroom is flanked by two teachers' rooms each of which provide a small area for staff lunch and can also be used for teacher preparation space, however, access to this space is impacted during staff lunch periods. Teachers may also use the library/media center for teacher preparation, but this area is also used by individual students and by classes which can limit the availability of space for individual and collaborative work.

Members of both the Grade 9 and Grade 10 teams in the ETA meet two days a week for collaborative planning. This common planning time is built into their schedule as part of their assigned duty. Currently, they hold these sessions in room 200/conference room. Quite often, however, their meeting/collaborative planning session must be relocated in order to accommodate another meeting that needs to be held in the conference room. As a result, these teams must seek alternate space within the building.

When other PLCs need to meet, they too must either try to book time in room 200 or seek an alternate location which will provide enough space and privacy the group to meet. As a result, PLC work and other opportunities for common planning time is often dictated by room availability.

The vision for the new school is to increase both time/opportunities and space for teacher collaboration. This can be accomplished by incorporating collaborative spaces into each academic area in each department as well as including shared collaborative space to allow for cross-disciplinary collaboration. Teacher workspace, equipped with worktables, access to technology and phones, and storage for planning / curriculum materials is essential to enable each teacher the opportunity to work both individually and collaboratively to design lessons to

deliver the curriculum. These workspaces need to be flexible in design so as to accommodate changing teacher needs and to be able to be used for both individual and small- group professional learning opportunities.

These teacher planning spaces need to be located in close proximity to the various academic neighborhoods to foster collaboration by subject, team as well as allow for interdisciplinary sharing. Each department space needs to have a table and rolling chairs to allow for flexible seating to accommodate a variety of professional learning and collaborative activities. Individual teacher workstations with flexible furniture, including individual locking file cabinets and flexible seating will ensure every teacher has a home base from which to work and allow teachers to spend valuable time during their preparation period on planning effective instruction rather than trying to find space to work.

Professional development/ professional learning opportunities occur in a variety of ways at Doherty. Whole- group, small-group, and one-on-one coaching sessions and individual activities are used throughout the year to support the needs of our teachers, and ultimately to support the needs of our students.

Each year the principal, Instructional Coach, and the Instructional Leadership Team (ILT) review the data to identify areas of student need. With that in mind, this group identifies which topics/ to be addressed for all staff members, which areas are content-specific and will be addressed professional learning session by department, which areas will be addressed in targeted small-group professional learning sessions and which areas will be addressed in one-to- one professional learning/coaching sessions with the Instructional Coach.

Professional learning opportunities take place using several formats. Each year the staff participate in two full day professional development days. During these days there is a mix of whole-group professional learning, small-group professional learning, academic department professional learning, and individual teacher reflection. Additionally, each month there is professional learning sessions help as part of the principal's meeting and during department meetings. Whole-group professional learning is held in the school's cafeteria and small break-out sessions take place in classrooms.

Professional learning takes many forms including, but not limited to presentations, (video, and/or speakers) book studies, modeling successful strategies, ongoing analysis of multiple sources of data, whole and small- group discussion and reflection, as well as a variety of training sessions such as MCAS / SAT test administration procedures, ALICE training, technology and other safety/wellness trainings. During professional development days, department meeting days and other after- school sessions, small groups meet in available spaces such as classrooms, the library and the conference room (room 200). One-to-one coaching/professional learning sessions

occur in the Instructional Coach's office or in individual teacher's classrooms. Technology coaching is offered by the school's two Google trainers and occurs where there is available space and access to technology.

While there are multiple opportunities for professional learning to occur throughout the year, the principal, Instructional Coach, and the ILT work to create a theme and establish connections between topics to link ideas and to create a web of professional learning that is applicable and supportive to all staff members.

The vision for professional development in the new building, as we move toward the academy and neighborhood model, will include expanding opportunities for teachers to meet in PLCs and increasing collaboration in PLCs in grade-alike groups/teams, vertical collaborative groups and cross-disciplinary groups. These collaborative and professional learning sessions will take place in the collaborative spaces located in the different "neighborhoods" associated with the academic disciplines (STEM/STEAM, humanities, arts, world languages, special education, etc.). With the addition of the Grade 9 academy, there will be increased opportunities to schedule common planning time for teachers who work with the same group of students. Additionally, with the creation of academic neighborhoods for core content classes for grades 10-12 there will be opportunities for grade-alike collaborative meetings by content area as well as by academic pairings (ELA and social studies, and math and science). The addition of collaborative spaces will provide places for these teachers to meet, something that is currently unavailable in the current building.

Within these spaces there needs to be appropriate technology to support professional learning and presentations and modeling of successful strategies. This would include being equipped with access to technology, printing, presentation equipment (projector, screen, sound, flat screen TV for video). Additionally, there needs to be shared collaborative space between the different neighborhoods complete with appropriate technology and presentation equipment (projector, screen, sound, flat screen TV for video) to provide both content- specific technology trainings and cross-curricular professional learning opportunities. Such shared professional learning/collaboration space could occur near the humanities departments, STEM departments, arts departments, health and wellness departments and counseling/administrative departments.

Professional learning is a continuous process and needs to be able to be delivered and allow for active participation in the various venues. Whole-group professional development opportunities require a large area with appropriate access to technology and presentation equipment (projector, screen, sound, flat screen TV for video). Both the cafeteria and the auditorium need to be designed to allow for professional learning presentations --access to technology, sound, presentation equipment (projector, document cameras, screen, TV

Professional learning also involved individual support and one-on-one and small group coaching. Doherty currently has one instructional coach. The vision for the new building is to provide a space for two Instructional Coaches (one for the humanities and one for STEM) where each coach can meet with small groups and in private with individual teachers. There needs to be a shared collaborative space for planning and presenting professional development complete with access to technology and presentation equipment (projector, screen, sound, flat screen TV for video) and access to whiteboards to model successful instructional strategies. There also needs to be adequate storage space for professional learning resources and materials for both the Instructional Coaches and staff members.

LPA|A Response: Teacher planning spaces are integrated within each 9th Grade Team, and within each academic department. Additional cross-discipline teacher planning spaces are located between the Math and Science departments and between the English and Social Studies departments.

Assessment Coordinator

Students in Grades 9-12 engage in a variety of assessments to measure student progress. Assessments include Star assessment, PSAT/ SAT, AP assessment, ACCESS test for EL students and Massachusetts Comprehensive Assessment System (MCAS) assessment, which is a graduation requirement. The Assessment Coordinator, referred to as the MCAS Specialist currently works out of an isolated office on the first floor to keep secure test materials.

The vision for the new building is to provide a space for the Assessment Coordinator/MCAS Specialist to prepare test materials, review data and monitor/administer assessments that occur throughout the building. The area needs to have access to technology (desktop computer) that allows the coordinator to oversee online testing that occurs in classrooms. While many of our assessments are nor given electronically, there are still some hard copy test materials (student test tickets, paper test for students for which this is an accommodation in their IEP) that need to be secured. There needs to be space within this office to organize test materials and to meet with teachers and students to review data and test results.

LPA|A Response: An MCAS Coordinator office is included within the Main Administration Suite, with access to a conference room and storage.

Room Assignments

Currently, the assigning of rooms is difficult due to our overcrowded and outdated facility. Over 50% of the teachers in our school travel from room to room and although we attempt to limit the distance it is difficult to keep the traveling teachers within the department to which they are assigned. As mentioned throughout this document, some courses are being taught in rooms for which they were not designed, and others are simply too small for the number of students in our classes. The vision for the new school is to maintain the assignment of rooms by department with intentional adjacencies to support teaching and learning. Rooms dedicated to the ninth- grade teams, Special Education and Chapter 74 programming will not follow the departmental or "neighborhood" room assignment methodology but rather will be integrated into "neighborhoods."

F. Lunch Programs

Doherty Memorial High School's current cafeteria includes approximately 4312 square feet, excluding the kitchen, food preparation, storage, and point-of-sale stations. There are 36 tables for student seating. During each seating, students enter through one of several identical serving lines. Each line operates similar to a cafeteria-style, where an employee serves the food onto disposable trays and places these trays on a stainless-steel serving station. Students move across the serving line and select their items, ending at the point-of-sale station operated by another cafeteria employee.

Per district policy, all students in the Worcester Public Schools are offered free breakfast and lunch each day. After making their meal selections, students enter their unique Worcester Identification number at the point-of-sale station. If a student selects additional items during a meal, they are able to pay cash for these items.

The current Doherty Memorial High School cafeteria is situated at the end of the first-floor corridor. Students are able to enter and exit through a primary entrance, with a secondary entrance at the back of the cafeteria. At the start and end of each lunch period, there is a delay in dismissing students promptly as the limited number of exits, as well as the layout of the corridors and stairwells, hinders the timely flow out into the rest of the building.

The cafeteria space provides seating for students with bench-style, foldable, rectangular tables. The maximum capacity of these tables is approximately 432 students. With a student population well over 1500 students, and with 3 lunch seatings, the cafeteria is currently over capacity during each lunch period. Some students are able to each lunch in other supervised settings, including classrooms, the guidance area, administrative offices, and in the library, when available.

The hope with the new school construction design is to ensure adequate space for a third of the school population. The district-wide secondary-level bell schedule designates three lunch seating

sessions, approximately starting at 10:45 a.m. with the last seating ending shortly after noon. The planned student population is 1670, so the cafeteria will be designed to support 557 students per lunch period.

Prior to the start of the school day, students are able to acquire breakfast from the cafeteria. Many students choose to select their meals and sit in the cafeteria space, while others elect to take their selections and head to their classrooms, lockers, or to meet up with staff and/or students. Cafeteria planning and delivery models are changing to reflect a 'grab and go' service style. Once the school day starts, students coming in late still need the opportunity to get breakfast. Therefore, there will be one 'grab and go' serving station available in the serving area that will remain open once the school day begins. This station will be structured to serve as a stand-alone, albeit smaller, entity that serves students at non-traditional times. For example, this stand-alone, self-sufficient station would serve students coming late to school, arriving after the starting bell and after the main cafeteria and kitchen closes as they begin preparations for the lunch service. In addition, this station would now provide opportunities for students, e.g. those participating in afterschool athletics or extracurricular events, to access nutrition in the later afternoon or evening. This stand-alone, self-sufficient station's design will include a point-of-sale unit, handwashing infrastructure, a refrigeration unit, dry storage, a countertop heating cabinet, and will be kept secure via a rolling overhead door. This station will be accessible to students without needing to enter the main kitchen or main serving area.

The new cafeteria design will consist of one central kitchen and serving area adjacent to the student seating area. The design will enable proper visibility throughout both the serving and seating areas for supervisory purposes, and will have windows providing daylight throughout the space. During passing time, there will be multiple points of entry and exit, thus ensuring a steady student flow. The student seating areas will consist of several smaller, though connected, dining areas revolving around this central kitchen and serving area. The new school design has planned for 8350 net square feet for the cafeteria seating area. This space, while dedicated for breakfast and lunch time use, will be available as a multi-purpose space during non-meal time hours.

The student seating area will connect to an exterior dining area. This space will allow for overflow during the school day and would allow students to be outside during appropriate weather, but will also enable after-school activities, e.g. athletics, to access the kitchen space.

In order to provide the same access for staff to meals, a faculty cafeteria will be situated adjacent to this space. This space would occupy 200 net square feet and would contain a buffet-style adult service station, and would be structured with a single, linear serving line ending with a point-of-sale unit. One additional benefit of this space is that it would allow for other adults, e.g. school visitors, to have access to meals if needed, though the design is not intended for steady community usage. The faculty dining room will essentially provide the full range of cafeteria

services and options through a reduced footprint. This station can be operated by staff members, and can provide meal options to students beyond the school day.

To facilitate ease of serving and to provide access to food during a teachers' preparation period as well as to students who participate in after-school activities such as sports or drama rehearsals, etc. We are planning to include a robotic salad machine "Sally" by Chowbotocs. This robotic vending machine customizable, made-to-order salads, snacks, breakfast bowls, and grain bowls within a sleek 3×3 footprint, requiring minimal space in the cafeteria. No additional space is needed if the machine was not available. This machine, located in the faculty dining area will provide continued access to healthy snacks beyond the school day. The ingredients will be prepared by current cafeteria staff and menu items can be updated seasonally and could incorporate items that are grown in the school's garden/growing spaces.

The proposed main cafeteria serving area will be based on a scramble-style service. This is a variation where numerous stations are arranged around the space, each serving different foods. The variation in menu selections, along with the expected student population being served on a daily basis, demonstrates a need for 5 serving stations within the serving area. Students would go from one station to another, and after making all selections they would then exit through one of several point-of-sale stations. One benefit of this scramble-style service is that students can move from one serving station to another without having to pass through an entire line offering choices of which the student will not select. Research indicated that a scramble style kitchen enables more students to be served in shorter periods of time. Within similar research, however, scramble style serving areas require more space than single line serving stations (Beasley, 1995).

The desired ratio is 75 students per point-of-sale station. The proposed design is planning for 6 stations. This figure represents a balance between the available staffing with the logistics of ensuring students are able to efficiently move through the serving stations and have sufficient time to eat. Typically, 80-90% of the school population cycles through the cafeteria serving lines.

In order to accommodate such a high volume of students during each seating, the scramble style serving area is planned for 3000 net square feet. This will be supported by a kitchen and preparation area adjacent to this serving area. The planned kitchen area would provide 3,146 net square feet and would include a Dry Prep area which is utilized for bundling nonperishable meals. The space can be used to prepare breakfast and lunch meals for Doherty as well as for distribution at other schools within the district that lack facilities and space. For example, the kitchen at another city high school, with allocated conditioned/refrigerated space is preparing salad and fruit servings that are then shipped to other schools across the city.

The kitchen space would include 'pass through' style doors, have central tables and food preparation, dry storage shelving around the perimeter, ovens and warmers, a dishwasher, and appropriate hand-, food-, and tool-wash sinks. The kitchen will also require a walk-in freezer and walk-in refrigerator. Each would be approximately 200 square feet, with 8-foot tall ceilings.

The refrigeration units and the dry preparation spaces should be in proximity to the loading dock or delivery area. This would allow for prepared food deliveries to be moved to and from the loading dock without having to travel through the main kitchen. Within the kitchen space, an employee office space will accommodate up to 6 workstations. These employees will utilize an adjacent locker room/changing area, including a lavatory and shower facility. A custodial closet, providing storage for cleaning supplies and related materials, will be accessible from all associated areas.

LPA|A Response: The proposed kitchen, servery, cafeteria and grab-and-go station are sized and located to support the district's goal to efficiently provide nutritious food to 1,670 students.

G. Technology Instruction Policies and Program Requirements

During the 2018-2019 school year, the Worcester Public Schools converted the majority of hardware and software to utilize the Google suite of products. Most staff members, including all teachers, were issued a Chromebook for their individual utilization. In addition, based on the school population, each school was allocated a number of Chromebooks and storage/charging carts for classroom utilization. Staff members are permitted to bring their Chromebooks home for lesson planning and preparation. With these devices, faculty members can access the Google G Suite of office applications, including Docs, Sheets, Slides, Drive, Calendar, and others. These applications provide similar features to the Microsoft Office products, i.e. Word, Excel, PowerPoint, etc.

In addition, the school has purchased numerous carts outfitted with a document camera and a projector. These are assigned throughout the building and are shared between all staff. These devices connect to desktop and Chromebook computers and are used by educators and students for instructional purposes. Some classrooms have a ceiling mounted projector, installed by Doherty staff.

Prior to this transition, Doherty relied primarily on desktop computers and traditional computer labs located throughout the building. Each classroom had a desktop for staff use, there were several generalized computer labs, including one in the library, others for general classroom use, and some computer labs were designed to support specialized curricula. Chromebooks, and the

associated G Suite software, now provide typical general education classrooms with the ability to conduct research, perform word processing tasks, and design and implement presentations.

However, Doherty offers several courses of study and educational programs that require hardware and software that stretches the limits of the Chromebooks. Prior to the transition, therefore, each school was able to request and plan for their unique number of needed computer labs-labs equipped with more robust desktop computers that can operate specialized curriculum, including the computer programming, marketing software, and the varied engineering tools, e.g. AutoDesk, required in those courses. Each computer lab designed and/or retained in the school lowered the allotment of student Chromebooks that would ultimately be delivered.

The student Chromebooks are stored in moveable charging carts. These carts are stored throughout the building and are spread across each floor. The school administration created a digital calendar allowing staff members to reserve the carts for specific days and instructional periods. Each day, staff members will move these carts from one location to another based on this reservation system. With 73 classrooms and 24 carts, each cart is used daily.

Each Chromebook cart is assigned to a specific classroom for evening storage and charging purposes. This 'home-base' policy ensures that all carts are accounted for at the end of every day and that they are properly charged for use for the coming day. During a typical day, the period 1 educator who has reserved the cart will go to the home-base classroom and bring the cart to his/her classroom. The educator has a standardized sign-out log, where each student is assigned a specific Chromebook for usage. This is done to minimize the loss of instructional time in getting the Chromebooks to each student.

Part of the Worcester Public Schools', and Doherty's vision of a graduate and guiding principles is to graduate computer-literate students. Students coming to Doherty have unique and diverse background knowledge relating to their skill sets and technological proficiency. All staff, throughout the school year, plan lessons and learning activities where students will utilize the available Chromebook technology to engage with their respective curricula. Students conduct research, discuss and respond in writing to a variety of prompts, prepare and deliver presentations, etc. Effective with the 2018-2019 school year, Doherty is administering several standardized exams, including the MCAS exams, AP Spanish Language and Culture, and an internal diagnostic literacy and mathematical proficiency test, via the Chromebooks. To ensure that student exam scores reflect their respective level of curricular comprehension, as opposed to their computer-interface proficiency, staff plan lessons that enable students to learn the mechanics of using the devices prior to the exam administration.

Near the end of the lesson, the educator ensures students have saved their work, logged out, and returned the Chromebooks to the cart in preparation for the next period. This process takes

several minutes of instructional time. At times, the cart will remain in the classroom for the incoming students, but often the cart will be moved to another classroom. Given the crowding in the extremely narrow hallways during transition times, educators often try to move the carts in the moments right before the dismissal bell, or in the moments right after the bell to start the next period.

The process then repeats with having students getting their assigned Chromebooks. In general, each cart is used throughout the day, and often each cart is moved from one classroom to another, and ultimately is returned to the home-base for evening storage. There are numerous carts on each floor of the building, approximately proportional to the number of classrooms therein.

With the transition to MCAS 2.0, the Chromebooks are used for standardized testing. Given the approximate size of the testing population, the majority of Chromebooks (21/24 carts during the spring 2019 MCAS administration) are reserved. Carts are reassigned to specific testing rooms for the exam administration days, and several are brought from other floors. Given that there is no elevator, carts are brought outside and wheeled through the parking lot to a doorway accessing the testing floor. This is done the day prior to the start of testing. This necessity reduces the availability of this technology for general classroom usage during exam administration.

The Worcester Public Schools, through their Office of Instructional Technology and Digital Learning, regularly offers Chromebook and G Suite training to all WPS staff. Recent trainings target novice, intermediate, and more experienced users, and include numerous offerings throughout the summer and school year: Beginning Google Challenges for Educators; Rethinking Lesson Planning with Digital Tools; and G Suite Accelerated Trainings are all recent offerings. Doherty has identified and trained, through this district office, several staff members to be ‘Google Trainers,’ or site-based personnel with more advanced knowledge so that he/she can provide more timely and personable support to the building personnel as each continues to improve their facility with the relatively new technology. Doherty, through its internal professional development opportunities and facilitated by the in-house Google Trainers, provides support for any interested staff members. This support happens through formal planned sessions, e.g. during a faculty meeting, but it also is provided informally through one-on-one conversations and requests for assistance from a staff member to the Google Trainer.

The Worcester Public Schools Information Technology (IT) Department services and maintains this technology. Staff devices, if damaged during normal usage or through expected wear and tear, are replaced with an equivalent unit. If a student Chromebook is damaged, it is sent to an administrator who submits a repair ticket to IT. A member of IT will collect the device and

return it after repairs are implemented, usually within one to two weeks depending on the nature of the damage.

The Worcester Public Schools' Strategic Plan outlines the district-wide goals and objectives relating to technology and the students' development of technological skills. In part, the Worcester Public Schools ensures that "all students will have access to rigorous and personalized learning supported by technology." Technology certainly includes computers, Chromebooks, printers, projectors and other standard classroom devices, but also extends to curriculum specific tools. For example, the Doherty Science department utilizes TI Nspire devices within their laboratory activities, the Mathematic department provides opportunities for students to utilize the range of programs available with the more advanced TI Graphing Calculator series, and the World Language department utilizes programs that enable students to speak and record as they learn another language.

The Worcester Public School's Strategic Plan, through the Office of Digital Learning, has outlined a plan to provide 1:1 classroom coverage for all school for the start of the 2024-2025 school year. These Chromebook devices will be leased. As such, each classroom will require appropriate charging stations (standard 110-120V outlets).

The acquisition and utilization of educational technology is coordinated by the district's Information Technology Department. The responsibilities of this department include the maintenance and infrastructure support for every school and program in 55 locations. Further, the department supports:

- Over 1,500 computers, 14000 Chromebooks, and over 3,000 iPads;
- 75 servers, including file, domain, and backup servers;
- A district website with a content management system that allows schools, teachers, and administrators to modify their personal website;
- Cloud hosted email services for WPS employees and students;
- Internally developed and maintained student and employee information systems;
- Data analyst services providing data for research and evaluation purposes.

The district utilizes CIPA compliant web filtering, email archiving, backup data protection, fiber wide-area connectivity to all sites, and a 10 Gbps internet connection.

The IT Department, as part of the district's Strategic Plan for Education, has set goals and benchmarks to positively affect all schools, including Doherty. These goals include:

- The acquisition, implementation, and support of an updated student information system. Currently the district utilizes an internally developed system maintained by district employed programmers. The adoption and implementation of a commercial, industry-standard student information platform would provide

additional features and benefits for families, students, staff and administrators at all levels.

- The improvement in wireless access in school buildings. The goal is to develop and maintain a robust wireless infrastructure to support a 1:1 device initiative throughout the district. The current Doherty facility offers three levels of wireless access, though coverage is constrained by the physical layout. In any new design, the campus will be equipped to offer industry-standard, up-to-date coverage throughout the entire campus.
- Address the digital divide outside of school. The goal is to improve after-school access to technology and the internet to support student learning.

The goal for the new facility is to ensure full wireless capacity. This will be accomplished with two network drops in each classroom space, two for the teacher's main station, and ceiling mounted network access points. During the feasibility and visioning sessions, several community members raised concerns relating to the health effects of Wi-Fi. During a December 2016 School Committee meeting, the Standing Committee on Teaching, Learning and Student Supports made a report to the full group, part of which included a motion to develop a set of best practices relating to mobile devices. The presentation also stated that the City of Worcester, in policy practices and design decisions, follows the recommendations of the FCC, the governing body on Wi-Fi exposure.

As the Doherty community worked to develop this Feasibility Study, the goal is to increase the number of vocational offerings available for students. One identified vocation - Programming and Web Development - was chosen due to the demonstrable interest among students, as well as the expanding labor market in the local, state, and national regions.

As the school personnel, curriculum advisors, and the advisory council develop the Programming and Web Development program, the goal is to create a partnership with the district Information Technology office, establishing an in-school functional training center. This Information Technology office space would house the school-to-district networking infrastructure, include office and computer workspace for the district's Information Technology Support Specialists, the personnel who maintain the school's software and hardware needs. These Support Specialists would also serve as partners with the vocational program educators to provide practical experience, tutoring and training, and mentoring to the vocational program students. The Information Technology office would, in essence, function as a workspace for the school's Support Specialists while doubling as an industry-standard worksite for students to apply their curriculum knowledge and skills from their coursework. This partnership will be a critical component within the proposed vocational programming.

To welcome students, parents, community members, visitors, and others to the school, an interactive display is desired in the lobby near the main entrance. This display will provide branding and integrate the history of the school, but also provide valuable information, such as office locations, to visitors. The suggestion for an interactive welcoming display originated during the visioning process and then fortunately, we were able to observe an interactive display during one of our school visits to a newly constructed high school, Billerica Memorial. We envision this tool as a means to integrate technology, an identified priority, and we view this as an invaluable way to share information with visitors and members of our school community alike in an interesting and engaging manner. The entire branding package will support our desire to capture our sense of belonging, to foster school spirit, and to capture valuable connections between our school's past, present, and future. We plan to have our students involved with the development of our branding package design. To strengthen partnerships and relationships throughout the school, students from the Programming and Web Development program will liaise with organizations, athletics, clubs, academic and support departments, etc., and create and maintain the displays available for viewing in the lobby.

The Technical Services/Information Technology space in total will encompass 4500 square feet, will house the school's critical servers, networking, and related hardware, and will be comprised of the following:

- One secure access room to accommodate the Main Distribution Frame (MDF). At 150 square feet, this MDF includes the interface between the telecommunication utility's and the school's access connection (demarc to fiber connection), the primary routing switch for the building, as well as the network hardware enabling network access for the building. The server and related infrastructure are to enable Doherty to access critical technological services. This technology requires 200 Volt service and must be climate controlled.
- A technical equipment receiving and storage room. At 500 square feet, this space would ideally connect the IT office space to the exterior of the building, allowing for deliveries and access to district personnel as needed. This space would double as the storage and maintenance location for the school's generalized audio/visual needs (e.g. projectors, document cameras, video players, microphone and speaker equipment, etc.).
- A multi-use space.
    - At 2000 square feet, this space would be subdivided to house 8 individual work-stations for the Support Specialists. The Support Specialist work-stations will service both Doherty and district-wide technology needs. Each school is assigned a Support Specialist, and so Doherty's Support Specialist would be allocated a workstation in this space in which to work. This space will enable multiple students to engage individually with professionals at the same time. Each work-station would include an

individual home-run or link into the Main Distribution Frame, a computer station, and a workbench/desk. The station would require network access and be serviced with multiple 110 Volt outlets.

- The remainder of the multi-use Information Technology space would be an open-concept conference set-up, so that a group of students can work together, but also enable Support Specialists and IT Staff from across the district to have a collaborative workspace. The conference set-up and additional work-stations support district-wide needs.
- With the inclusion of the Programming and Web Development Vocational Program, Doherty plans to utilize this combined IT space collaboratively with the Support Specialists: The Support Specialists will have a role within our vocational programming. Students will be able to work with Support Specialists to engage with their curriculum through real-world applications. Upper-class students will have opportunities to complete their co-op or internships in-house alongside the working members of the IT department.
- The space would include Audio/Visual technologies for presentations, collaboration, etc.

All IT spaces will be accessed via ID cards, providing permissions for authorized personnel. The MDF/IDF and network will be supported by generator-provided back-up power if needed.

The Information Technology office, storage room, and MDF should be adjacent to the vocational Programming and Web Development classrooms due to the close integration of the functional workspace with the academic instruction and opportunities for practical experience.

The Information Technology Support Specialists maintain the school's network infrastructure, but also service school equipment including desktop and Chromebook computers, projectors, switches and servers, etc. The Support Specialists, working in-house, would, in part, help ensure reliable access to network services throughout the day. Reliable access, and available personnel to troubleshoot issues, is vital as more and more classroom learning activities and standardized assessments are computerized. The design would therefore include a lavatory space-sink and toilet-adjacent to or within the Information Technology office space so that both students and school personnel can maintain hygienic conditions when working with this sensitive and costly equipment.

In addition, several spaces within the design will include Cable TV capacity. These include the main office, MDF/IDF rooms in the IT space, library, and the cafeteria. Access will not be wired to each classroom. There will be converters for broadcasting from the gym or auditorium through the network, as needed.

LPA|A Response: The appropriate spaces and infrastructure will be distributed throughout the building as required to support the school's technology program. The Technical Services/IT space will be located in proximity to the Chapter 74 Programs.

Media Center/Library

The Media Center/Library is located on the second floor of the existing school structure. The Media Center/Library houses a set of approximately 6,000 books, including fiction and non-fiction texts. These books are primarily used for student use, both recreationally and for classroom learning activities and assigned reading tasks. The Media Center also contains a variety of DVD and VHS videos supporting a range of curricular topics. These videos are available for teacher use. The Media Center offers an assortment of magazines as well, supported via donations from a variety of sources. Years ago, the Media Center also included a computer lab, available with reservations for classroom use.

There are currently two Chromebook carts, providing a total of 60 devices, available for student and/or educator use. There are three desktop computers which offer print capabilities to students working in the space. Currently, student Chromebooks do not offer direct-to-printer access. A projector and a portable white board are also available.

During the school day, students are able to get passes to come to the library. Typically, this occurs when a teacher is absent, and the student is able to sign in. Students often then use the available devices for research and for classroom assignments, or are able to work individually or in groups at one of the available tables in the space. There is no private collaborative workspace however: student groups may be working and discussing project tasks next to students working privately on their own.

The Media Center is staffed by a full time, certified librarian, and is further supported by several staff members for which their duty is to assist and monitor students utilizing the space.

The Media Center opens approximately 30 minutes before the start of the school day. A staff member is assigned to supervise the space, and students are able to sign out Chromebooks, use the desktop computers to print as needed, to check out texts, and are able to get a pass for an instructional period later in the day, when available. Similarly, the Media Center is open for 40 minutes after school, again for students to have a space to complete homework, work on classwork activities, or collaborate with others. Another staff member is assigned to the space after school to provide supervision.

During the school day, the Media Center can be reserved by staff for classroom use. Most often, educators reserve the space and bring their classes to the Media Center in order to utilize the available Chromebooks. At times, educators will use the space to conduct student presentations. Administration occasionally reserves the space for district-level meetings, though due to the layout, available technology and limited on-site parking most administrative meetings are scheduled for another location with more readily available amenities. At times throughout the year, the Media Center is reserved in order to administer various standardized exams, including MCAS, AP Exams, ACCESS testing, etc.

Doherty Memorial High School is currently working on a repurposing of the existing Media Center space. With the removal of desktop-based computer labs across the school and the acquisition of mobile Chromebook carts, the frequency of staff bringing their classrooms to the space has decreased.

The school community envisions an up-to-date, flexible space that allows for student, staff, administrative, and community use. Increasingly, students are engaging in collaborative learning tasks requiring research, synthesis of skills and content knowledge, and the development of a presentation or a product to share with others. A flexible workspace providing appropriate technology, a level of privacy so as to not hinder the work of others, and with the convenience of access throughout the day will enable students to engage in rigorous, multi-disciplinary performance tasks. Similarly, a modernized space with audio/visual and presentation capabilities will allow for effective staff use, such as for collaborative conferences, administrative meetings, etc. In addition, Doherty will be able to make the Media Center available for student community use, including during non-school hours.

Moving forward, the Media Center still needs to serve as a repository for text materials. However, there is greater potential for the space. The design and implementation of a 'learning commons' space would enable all school and community members to have the flexibility to utilize the space based on the needs of their performance task. Additionally, the vision for the new facility includes a career center, a cafe, and multiple printing stations per each grade to be located in the media center area.

LPA|A Response: The Media Center will be centrally located for efficient access from the academic spaces. The space(s) will be equipped with technology and will be outfitted with flexible furniture to accommodate a variety of uses.

Makerspace

At the start of the 2019-20 school year all members of the Worcester Public Schools participated in the district's fourth annual Opening of School Convening and Recognition of Excellence ceremony. Keynote speaker Jaime Casap challenged the audience to think about technology and reminded us not to "ask kids what they want to be when they grow up but what problems do they want to solve. This changes the conversation from what I want to work for to what do I need to learn to do that." This challenges us to provide opportunities for students to explore and to create as part of the learning process.

As summarized in the 2018 Stem Learning Design Report, 'Review and Recommendations of Best Practices for K-12 Learning Spaces,' schools and districts are shifting educational decisions and methodologies to align with the 'innovation economy model.' Doherty Memorial High School readily agrees that students need learning opportunities that emphasize process skills, decision making, contextual and community-based problem-solving experiences, etc. The vocational engineering program offers a subset of the students' ample opportunities to acquire content knowledge as well as practical, competencies and skills. The desire and goal are to increase the range of innovative learning models available to all students, regardless of their choice from the various educational programming options being proposed, and this is in agreement with the STEM Learning Spaces report:

> Schools have begun looking for opportunities across the curriculum to integrate more of a process focus, including engineering design and prototyping, to prepare students. Learning spaces to support this model focus on collaboration and sharing tools, inclusion of a wide variety of materials and small-scale mechanical and digital tools to quickly prototype and test solutions, and flexibility for regularly changing projects or contexts. (p. 12)

As students' progress through the K-12 system, en route to college and/or careers, there is a clear demand to ensure that students have mastered a suite of readiness skills across a range of content areas. Currently, students have opportunities to engage in rigorous learning experiences that reflect interdisciplinary and integrated learning. Notably, within the Engineering Technology Academy, the school's vocational Engineering Technology program, students complete several 'learning fair' projects. These projects are designed by an interdisciplinary team of educators representing Engineering, Science, Mathematics, English, and Social Studies. Over the course of weeks, students complete a variety of tasks within and across their courses, ultimately integrating all components and presenting their work in a family and community forum.

Figure 3 Figure 4

A student's display containing elements from each of his five core academic classes: Engineering, Science, Mathematics, English, and Social Studies. All projects are then on display for students as they share and discuss their work with family and community members attending the learning fair showcase.

Figure 5 Figure 6

Each ETA student designed a parcel of land based on various zoning criteria. Combined, the students recreated the path of the Blackstone Canal, originally running through sections of Worcester. Students reimagined the Canal district, incorporating environmentally friendly designs and that accommodate the needs of a diverse community.

Outside of the teamed ETA, integrated learning is relatively new for many students and staff. This is mainly due to a lack of space for common planning and for interdisciplinary planning, existing space and technology limitations, and the lack of much needed adjacencies between and among various departments. Often, teachers within their individual classes will design learning activities that incorporate multiple domains of learning and that span content areas, but there are

challenges to implementing true cross-disciplinary work that brings multiple classes and content educators together.

The vision for the new Doherty Memorial High School is to incorporate design features to enable students and staff opportunities to engage in interdisciplinary learning. For example, the feasibility design is planning for ninth grade academies or teams, where educators would share similar groups of students within a close set of rooms, allowing for greater flexibility regarding the schedule, mixing student groups, and accessing and sharing the strengths of staff and students alike. There will be improved common planning space and adjacencies between and among departments to foster collaboration, interdisciplinary connections, project-based learning and real-world applications, which were priorities that were identified through the visioning process.

To support this collaborative effort, and enable all staff the opportunity to work together, e.g. in STEAM based learning experiences, the new Doherty Memorial High School will include a Makerspace that will be accessible to all. The goal is to integrate the available classroom technology, including Chromebooks, with modern and industry-standard equipment that, to date, many students have not experienced or utilized. This equipment includes, for example, 3D printing technologies, hand and simple power tools, manufacturing technologies, presentation technologies, and a range of learning materials based on the varied projects and student activities occurring within the space. As supported in the STEM Learning Design (2018) report, the space will enable flexibility as educators can plan for varied projects, changing equipment utilization, and that enable all educators within their core academic programs to have opportunities to utilize the space with their students.

While Makerspaces are often associated with STEAM education, there are robust opportunities for all staff from all content areas to enable their students to work collaboratively. Due to the collaborative nature that promotes group work, the MakerSpace will ideally be adjacent to the Media Center, which is a site that allows additional flexibility relating to group or project work, as well as for student presentations and showcases of their work. The space will be staffed by the school's Media Specialist, and this staff member will be responsible for maintaining the schedule and coordinating logistics, as needed. The Media Center's collections, technologies, and physical layout are designed to enable students to access resources and materials, along with instructional support from the educator and the Media Specialist/Librarian, as they engage in increasingly personalized learning activities. The adjacent MakerSpace supports student work as they hone their skills in preparing for entry into a 21stcentury workforce.

As the Media Center will be available for community usage, student work-both in progress and finished products-will be displayed, showcasing the students' abilities and talents as they engage in rigorous curricular learning activities.

LPA|A Response: A flexible Maker Space will be provided as part of the Media Center suite, which will be readily accessible to all students.

H. Visual Art

The Visual Arts Program in the Worcester Public Schools offers students an in depth exploration of the standards identified in the Massachusetts Arts Curriculum Frameworks (1999) and is informed by the National Core Arts Standards (2014). Support for classroom and after school activities are enhanced through partnerships with local and national cultural organizations.
At Doherty, in the Visual Arts department currently, there are three rooms dedicated to the teaching and learning of visual art. Consistently over time, we have received many more requests from students to participate in course offerings in Art than we have been able to accommodate. One credit in the Arts is required for graduation for all students in the Worcester Public Schools and we need to have appropriate space to offer additional courses to support student interest and fulfill this requirement. Beginning this year 2019-20, we are offering an Early College Course in Drawing on our campus as part of our partnership with Quinsigamond Community College.

Despite the recent staff increase from one Art teacher to three, the need for additional and more appropriate space continues for the study of visual art. Of the three classrooms dedicated to visual arts, only one of the rooms was actually designed for this purpose and is in need of updating. There is a need for increased number of working sinks, additional and flexible space for students in the art classes to work, and an improved centralized area to display their talents to the school community and the community at large. Despite the challenges of our current facility, our art students have won several different awards and have been recognized for their talent each year. Currently we have student work displayed in some areas of the school and we value the ability to showcase the incredible talent of our students, but much more space is needed to do so.

The vision for the new school includes increased staffing due to increased enrollment and additional and more appropriate space. In order to support teaching and learning in the visual arts we need classrooms with flexible furniture and adequate workspace, functional sinks and increased storage space. The art rooms should be located adjacent to one another in order to support collaboration and shared ideas and supplies. A digital art learning lab should be included to support several desired additional courses and to support the digital portfolio development needed for Advanced Placement Studio Drawing and for many college applications. These spaces would facilitate the implementation of our art education program and allow us to offer additional coursework such as AP 3D Art and Design, printmaking, graphic art, digital media art, digital photography, ceramics, sculpture, and digital illustration. As we move toward implementing the recently developed Arts Frameworks, which are currently posted for public review and expected to be fully adopted in the very near future, it will be important to have

appropriate space and technology. There is a need for additional collaborative space, called Common Rooms, to support the design and implementation of a cohesive art program.

Additionally, we would be able to incorporate the visual arts will our STEAM subjects and to support our proposed Chapter 74 programming that involves STEM. One credit in the Arts is required for graduation for all students in the Worcester Public Schools.

This flexible space, designated on the space summary as "Common Rooms," will provide for multiple orientations and uses, with flexible furnishings to account for current and future needs. These are multipurpose spaces for the benefit of all departments. These common rooms will provide sightline access to ~~of~~ classrooms, are designed to facilitate break-out sessions and will support such opportunities, and will allow for shared presentations and collaboration among classes. Additionally, there needs to be spaces will provide areas for the Visual Arts Professional Learning Communities (PLCs) to meet to collaborate and to support professional learning, complete with areas for presentation and modeling classroom. The arts program would benefit from additional storage pace in this shared collaborative space with individual work areas for each art teacher and dedicated storage space for their course-specific media.

Students would benefit from an outdoor workspace that is within easy access to and within visual sightlines of art classrooms, and an interior community space beyond the classroom with glass enclosed shelving to exhibit 3D work and permanent and movable boards for students to exhibit 2D work. As the design moves forward, the district will ensure that any outdoor space is fully accessible to users with mobility impairments. This space can be used for displays as well as for demonstrations and would benefit from furniture that allows for flexible seating arrangements. Classrooms should be neutral tones and have large windows for natural light with shades to darken classroom, interior multipurpose lighting, exhibit space, bulletin boards, white boards and a large space for students to create autonomously or in groups. Classrooms should have closets, deep sinks, long and wide countertops to work on big projects, large desks for students to allow for flexible seating arrangements, tables to accommodate multimedia and center working, drying racks, classroom cabinets with locks, and long, wide, and deep shelving for project storage. Each room should have easel space, technology space using both the distributive technology model (Chromecarts) as well a computer stations for a digital art lab, several electrical outlets throughout the room, wall area for vertical drawing, interactive screens, bulletin boards and white boards.

Floor plan should include a digital graphic arts room, ceramics and kiln room which will be located in a space accessible to the instructional space that is able to be secured for safety reasons. Visual Arts classrooms need to be located in proximity to the performing arts neighborhood to support collaboration among classes in the arts.

LPA|A Response: The Visual Arts classrooms are located on the main entrance level adjacent to the Auditorium and Performing Arts Maker Space, and are in close proximity to the Performing Arts classrooms. An open gallery/ arts common room will be integrated into the common/circulation space of the school.

I. Performing Arts

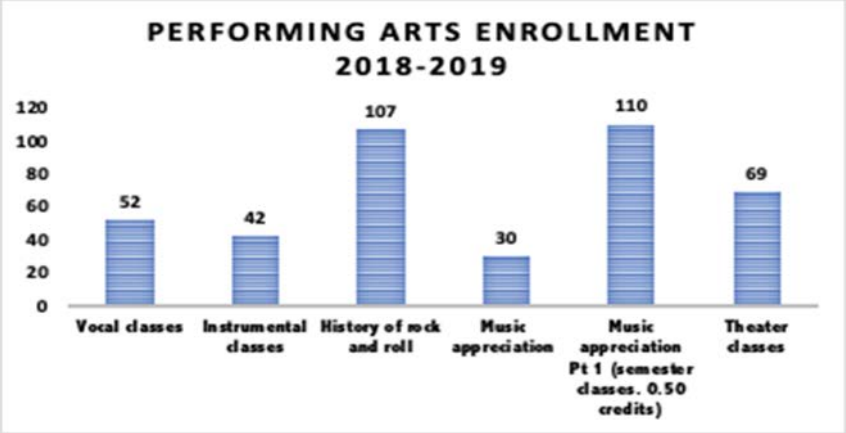
Doherty Memorial High School offers a variety of full year (1 credit) and semester (0.50 credit) music courses and full year (1 credit) courses in theater arts, both of which provide students with the opportunity to explore the history of the subject and /or develop their performance skills.

In 2018-19 the current 1-credit music course offerings included Chorus-Vocal I, Chorus-Vocal II, Chorus-Vocal III and Chorus-Vocal IV, Madrigal Singers I, Madrigal Singers II, Madrigal Singers III, and Madrigal Singers IV, Jazz Ensemble, Band-Orchestra I, Band-Orchestra II, Band-Orchestra III, and Band-Orchestra IV, Music Appreciation, and History of Rock and Roll. The semester-long 0.50 credit courses include Music Appreciation Part 1. The 1-credit theater courses include Theater I-IV.

The Worcester Public Schools' strategic plan notes both student and educator requests to "increase course variety and the opportunity to delve deeply into subject matter and explore current topics" (12). In an effort to support this interest and to provide additional courses in the arts to meet the Massachusetts Department of Elementary and Secondary Education's (DESE) MassCore and Worcester Public Schools (WPS) graduation requirements, additional courses were offered for students. This increase in course offerings was made possible by the addition of a second full-time music teacher.

During the 2018-2019 school year there were 341 students enrolled in music classes, either music history/appreciation or a performance class. Additionally, 69 students participated in theater arts courses. The school offered five sections of Theater Arts: three of these sections were Theater I while the additional two sections were comprised of a mix of students in Theater II-IV.

Figure 7



All of the performing arts classes are scheduled in the two classrooms in the music wing located behind the auditorium/stage. These classrooms were designed for use as music classrooms. The larger classroom (101) was designed for instrumental classes and the smaller room (103) was designed for vocal classes. Currently, the Theater Arts classes are held in these same classrooms.

Performing Arts classes utilize a variety of instruction methodologies including but not limited to whole group and small group instruction and modeling, small group activities, and individual exploration and rehearsal. Teachers work directly with students to instruct them to read music written in standard notation and to learn instrumental and vocal technique. Students are provided opportunities to perform individually and in small groups and large groups within the specific classes, within the school, and within the community at public performances. Students in the vocal classes have the opportunity to sing, alone and with others, a varied repertoire of music. Students in instrumental classes play instruments, alone and with others, to perform a varied repertoire of music. Students in music classes also engage in critical response through whole group instruction and modeling which includes activities such as listening to musical performances and participating in whole class, small group and individual reflections. Students utilize technology in order to access the course curriculum, explore musical pieces and music history and to engage in reflection of these topics utilizing technology. A Chromecart is available on the first floor to support this integration of technology but it is a shared cart and must be moved to the music wing for classroom use.

Within the theater arts classes curriculum is delivered through whole group instruction and modeling in includes activities such as viewing performances, both live and recorded. Students engage in blocking, rehearsing and performing scenes from and productions of entire works in order to demonstrate knowledge of the theater arts curriculum standards. Students work collaboratively in both large and small groups and require space to do so. Additionally, theater arts classes utilize space to demonstrate and to block scenes for class use and to rehearse.

Theater classes perform formal dramatic productions for a variety of audiences including their peers within their class and the school as well as public performances both during and after the school day.

The music wing, in addition to the two classrooms, has four small practice rooms, a music office that currently doubles for small group rehearsal space and storage and an additional practice room that was designed and predominantly used for costume storage.

The stage is located directly in front of the orchestra-instrumental room (101) and is used to as part of the instructional space for all performing arts classes. While the stage is an essential part of the auditorium and is often utilized for presentations and small-scale school assemblies, it is also an instructional space which provides opportunities for the students to learn and practice blocking, home their technical theater skills and musical presentation skills, and allow them to have authentic real-world application of these skills.

The orchestra room (101) is located directly behind the stage and provides the only access backstage to the right wing of the stage. The lighting board is located in the left wing of the stage but its current location limits space in the wings as well as a clear view of the full stage during performances. The catwalk is only accessible by ladder through a side hallway off of the auditorium and as a result is inaccessible by students. The location and condition of these dated items make it difficult to address the curriculum standards, especially in theater arts which requires students not only to learn about the technical theater but also to participate in the technical aspect of the performances.

The vision for the performing arts space in the new school includes additional classroom, rehearsal, and performance space to successfully deliver the performing arts curriculum (music and theater) and grow both the music and theater programs at Doherty Memorial High School. During the numerous school- and community-based visioning sessions, all groups consistently identified as a priority a need for increased programming within this department. We would like to add AP Music Theory to the course offerings in the music department. This course was taught as part of the music department in past years but has not been offered for several years. There also is a desire to expand the theater course offerings. Increased staffing and the availability of additional classroom space in the Performing Arts neighborhood would facilitate the ability to offer these courses. The current layout of the music wing and its classrooms limits the number and type of classes that can be offered at the same time. Room 103 is designed for chorus/vocal classes only. The room is constructed with tiered flooring (mimicking risers) /rows for seating for vocal practice with limited, narrow floor space making it difficult for instruction in other types of classes. This room currently is used for theater classes but the tiered flooring and limited level space at the front of the room makes it difficult to implement the theater arts curriculum. There is limited space for blocking scenes, modeling techniques, and conducting small or large

group performances in-class or for other classes in the school. It cannot be used for small-scale public performances either. This classroom is also used for courses such as music appreciation and History of Rock and Roll. The current configuration of the room makes it difficult to arrange the room for discussion or to implement instructional strategies/activities that require students to move around the room (e.g. gallery walk, inside-outside circle. etc.)

The existing design of music wing allows for only one instrumental class to be offered at a time. Room 101 is designed with tiered flooring arranged to allow for orchestral instruction/rehearsal. This is the only room designed for instrumental use/instruction. There are only four small practice rooms in this wing, and they are at the end of the hall, away from the classrooms and lack visibility from the classrooms. There is a need for individual/small group rehearsal/ collaborative space for all students in the music courses. This space needs to be designed to reduce sound distractions during rehearsals yet still be within the sightline /hearing of the classroom teacher.

There needs to be additional classroom space for theater classes. This space needs to have room to model acting techniques, demonstrate/teach blocking, and engage in individual and group scene work. There is a need for space to allow for small-group collaboration and rehearsal.

All of the performing arts classes require visual access to rehearsal areas and open spaces where small groups can collaborate and rehearse. Additionally, there needs to be easy access to public spaces such as the stage and its adjacent seating (auditorium). These areas are public areas and there needs to be a way to keep the classroom/educational spaces secure and yet easily accessible when needed.

The Massachusetts Arts Curriculum Frameworks indicates that music students need to be engaged in improvisation and composition, demonstrate the ability to rehearse an ensemble of peers, and conduct live performances. As a result, there is a need for a variety of performance venues for class and school use. Providing multiple performance areas for class, school, and community use in the design of the new facility was also a priority that was identified through the visioning process. A 90-100 seat multi-purpose “black box” theater area within the performing arts wing with flexible stage area, flexible and moveable seating, sound, projection screen, and a flexible lighting system would allow an additional performance space for small-scale performances. This area can be used for presentations/demonstrations with music, vocal, and theater classes and the flexibility of this space would allow students to demonstrate knowledge of the curriculum standards, especially the advanced theater standards which require students to demonstrate knowledge of technical theaters and the ability to lead a technical crew, create and implement a major design element (scenics, lighting, sound) for a production, coordinate all aspects of a production by stage managing a theatrical event, and apply technical

knowledge of safety procedures and practices in the use of theatre equipment, tools, and raw materials.

This black box flexible space will be used as a more intimate practice and performance space for band and chorus ensembles, as a location to showcase or present projects from all departments, and for “Coffee House” events. As performing arts classes run simultaneously with extracurricular activities such as theatrical productions or housing guest speakers, Doherty will require varied and flexible options based on the class and/or organization’s need.

Locating the performing arts neighborhood in close proximity to the auditorium and stage will enhance the learning opportunities for students. The auditorium can be used for in-school and public performances and presentations and should have a capacity of 800 or 900 or half of the school population. The stage itself needs to have adequate space in the wings to accommodate scene changes and cast and crew access to the stage, curtains and other performance technology. A space needs to be designated for the stage manager to coordinate backstage/production details.

A large overhead door on the back wall of the stage is necessary to provide access to the makerspace, loading dock or street. Any large door in this area with street access should be insulated both for weather and acoustic isolation.

The stage needs to be large enough to accommodate large ensemble casts, orchestral groups and choral groups. Sightlines on stage need to be considered in the stage layout in order to provide a full view of the stage from throughout the audience/seating area. The proscenium needs to be large enough accommodate the appropriate fly area, rigging, lighting, and curtains.

A lighting booth should be located at the back of the auditorium to allow for a clear view of the stage and allow lighting crew to control the lights on the stage and in the house. Dimmable house lights are needed to accommodate the various types of presentations that will occur in the auditorium. This lighting booth may also be used to run the sound board and is a needed instructional space allowing students to gain first-hand experience with the aspects of technical theater.

Auditoriums are incredibly sound-sensitive, so no matter the size or scope, a theater space’s mechanical, electrical and plumbing system should be designed by engineers who have prior theater design experience. Ductwork must be oversized (and often lined) to eliminate objectionable fan and air velocity noise. In addition, plumbing chases should be independent of both house and stage perimeter walls. Acoustics and placement of lighting needs to be taken into consideration when designing the ceiling of the auditorium.

The theater classes partner with classes in the music department and these programs need to be in close proximity/adjacency to these courses to allow for collaboration and rehearsal. A performing Arts neighborhood would allow for such collaboration between these courses and with other arts course within this arts neighborhood. In addition, the performing arts programs require additional spaces for performance preparation. They need to be in close proximity to restrooms and have a space that can be provide privacy for costume changes. A dressing area, including a sink, with ten to fourteen private stalls (based on the average number of most current productions) could accommodate an ensemble cast while also provide a dressing area for student performers who might have more frequent or fast costume changes. in addition to areas to store costumes. There is also a need to have access to sinks for cleaning and working on sets. Additionally, the theater department needs adjacency to the visual arts department to allow for collaboration and to maximize the use of creative space for set design and construction.

As we design a facility that enables students to engage in rigorous learning activities and contextual innovative projects within their core academic settings, the goal is to implement a Maker Space style area within the performing arts region to support the students' ability to apply technical knowledge of safety procedures and practices in the use of theatre equipment, tools, and raw materials. Students need space to be able to develop and refine artistic techniques and work for presentation (Massachusetts Arts Frameworks- T.T.6) that support organizing and leading the production of technical elements such as scenic, lighting, props, costumes, sound, or makeup design in a dramatic presentation (Massachusetts Arts Frameworks- T.T.5). This area should be located close to the stage to allow for easy access and to support the creation and implementation of these major design elements for a main stage production. Large/oversized doors in this area stage will facilitate access to the stage.

A makerspace adjacent to the arts space would support such student work which is not appropriate for a general education/performing arts classroom, given the tools and equipment needed and the nature of this messy work. Once constructed, these sets will remain in place for an extended period of time allowing for performing arts students to refine their design and construction skills and to refine and complete artistic work (A.C.T.Cr. 03).

Additionally, Doherty envisions this space to be used by performing arts classes and extracurricular groups, e.g. for the musical, the theater club, the art club, etc. Currently, Doherty’s performing arts classes and extracurricular organizations offer multiple theatrical productions throughout the year. Each of these requires set design and construction. Even after the sets are built, they remain built for lengthy period of time until the performance(s) is/are completed. Doherty classes and clubs build sets on the stage itself as there is no additional space available. This prevents the stage from being used by any other class, limits the use of the stage for group assemblies/presentations, or from any outside organization from using the space, during that time. The auditorium and stage are regularly limited or not available for general

teacher use. During the 2019-2020 school year, due to overcrowding, several classes have been assigned in the auditorium. Numerous repeated comments made during visioning sessions noted the need for multiple performing arts spaces. Building/keeping sets on the stage in the auditorium would limit the performing arts space that is available for the school throughout the year.

Storage space is essential in the performing arts neighborhood. Music and theater classes both require specific and often over-sized materials, whether they be instruments, music scores or large props such as furniture or multiple small props. These materials are used as part of the instruction and to support the delivery of the curriculum, allowing students to have a hands-on, authentic performing arts experience. Space that is easily accessible with appropriate storage methods (shelves, cabinets, closets/wardrobes, instrument storage, prop storage, and set piece storage, set construction materials such as lumber, paints and tools) and can be used to secure materials

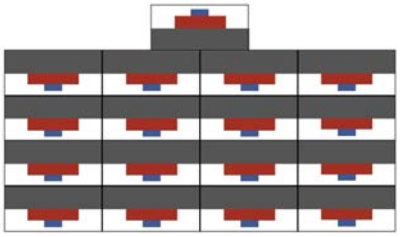
Access to technology is becoming increasingly important in all areas of the curriculum, including the performing arts. This collaborative space can also house the piano lab which will allow for increased opportunities for students to learn and practice the piano as well as experiment with music composition and arrangement and explore music theory. Piano labs that are equipped with a teacher-student communication system supports differentiated instruction in the music classroom allowing the teacher to instruct and support students with varying levels of proficiency within the same class. Students may work individually and in small groups in this setting to practice and refine their keyboard skills. Standard piano labs support between eight to sixteen students and need to be equipped to provide the teacher with a controller and headphones to monitor /listen to student progress. The lab needs to have individual student workstations/keyboards with headphones for each student.

The piano lab will be staffed by the music teachers and when a specific class is not scheduled into the piano lab during the regular seven-period day, it can be used on a rotating basis, under teacher supervision, to allow students the opportunity to work individually and in small groups to practice their skills both during and after the school day. As the lab will be staffed/supervised by the music teachers, there needs to be a teacher station with a conferencing system that allows the teacher to communicate with students and to supervise student progress. A standard piano lab with sixteen workstations requires a room that is at least 29’ x 24’ to accommodate each 5’x 5’workstation and a 4’ walkway and teacher workspaces.

Sample Configuration:
Figure 8

16 Student Class Piano Lab Room Configuration:

- 16 student workstations
- 1 teacher station



MINIMUM suggested room size for this configuration: 29' x 24'

Based on our recommended MINIMUM space for each workstation: 5' x 5'
and our MINIMUM walkway space and teacher workspace of: 4'

https://www.musicarts.com/cms/Classroom-Piano-Labs

A dedicated piano lab, staffed by the music teachers, will allow for individualized attention to students and differentiation of music instruction, providing support for music students at all levels. Students will be afforded the opportunity to study piano, something that is not possible for many students outside of school for financial reasons. Additionally, a dedicated piano lab will afford students with the opportunity to explore and create original music compositions as noted in the Massachusetts Arts Curriculum Frameworks (A.T.P.05) as well as to develop and refine artistic techniques and work for presentation (ASE.M.P.05). Between the music classes, both instrumental and theory, this lab would be utilized consistently throughout the day. Its adjacency to the music classrooms would allow for easy access for music teachers to bring their classes to the lab and to have visual access for supervision of individual students using the lab or practice and/or composition. This lab will help to support music skills and allow for cross- curricular sharing with the theater department as the two departments collaborate to provide instruction in musical theater both during and after the school day.

Collaborative spaces such as this can help students to listen to music and identify the parts of the composition as well as to learn to build their own musical compositions. This can be accomplished by establishing lab within the neighborhood than also can house desktop computers used for composition and can be shared with other performing and visual arts classes. This shared arts computer lab will provide opportunities for students to experiment with sound and composition through Musical Instrument Digital Interface (MIDI) software programs such as

GarageBand. This program allows students to explore music at their own pace while benefiting from teacher support in a group setting. Using GarageBand will allow students to build their own songs and to collaborate with their peers on compositions, experiment using virtual software instruments. This will require a computer lab space with room for desktop (Mac) computers to support this program. GarageBand allows students to record and listen to themselves. This shared lab will be used during the music classes and will be staffed/supervised by the music teachers. When not being used for specific music instruction, this lab will provide an opportunity for cross-disciplinary sharing and collaboration as students and teachers from other departments can utilize this space and program to record and listen to themselves to support fluency. Speaking skills are essential as noted in the districts' High-Quality Reading, Writing and Discourse document and access to this program will benefit all students.

The dedicated teacher planning space will allow for collaboration among music, art, and theater teachers to support student work and collaborative projects in the arts. Production meetings as well as individual auditions can be held in this space.

Currently, Doherty staff's two full-time music teachers as well as one full-time theater arts teacher. All programs are full and wait- listed students are consistently looking for opportunities to join. In addition, the school infrastructure and classroom space currently limit the course offerings. Doherty intends to expand the teaching staff within the new building to better meet the needs of students in offering additional and more varied music and performing arts classes. As the program grows, there will be increased opportunities for teachers within the two departments-Theater Arts and Music-to collaborate.

Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

Doherty understands that these spaces exceed MSBA guidelines and are above and beyond the allotments within the template. However, the school's scheduling challenges, wait lists for programming, and student interest demonstrates the need for such space. Recent expansion of our visual arts program has added an additional art teacher allowing the school to plan to expand the current visual art courses to meet student interest and to alleviate the need for wait lists for art courses.

LPA|A Response: The Band Room, Chorus Room, Theater classroom and Black Box Theater spaces are located on the main entrance level directly adjacent to the auditorium stage. The Art and Music teacher planning room and the Performing Arts Maker Space are strategically located to bridge the performing arts and visual arts spaces.

J. Physical Education/Health

The goal of the Worcester Public Schools Health and Physical Education Department is to provide students with the necessary skills which enable them to make safe and healthy choices in a variety of situations. In addition, students are given those skills which are needed to make fitness a life-long habit. The Health and Physical Education Curriculum, which is aligned with the Massachusetts Comprehensive Health Curriculum Framework, is taught by certified Health and Physical Education teachers.

Doherty Memorial High School offers a semester (0.50 credit) courses in health and quarter (0.25 credit) courses in physical education (PE). The current 0.25-credit physical education course offerings include Physical Education I-IV.

At Doherty, Grade 9 students participate in Health I classes for a semester. The health classroom is not in close enough proximity to the gymnasium which precludes the type of collaboration that we would like to support between the Health and Physical Education teachers. The vision for the new school is to increase the number of health teachers and the number of classrooms to support the growth of the health course offerings. The School Adjustment Counselors deliver the Signs of Suicide (SOS) Curriculum through the health classes each semester in collaboration with the health teachers. We view this particular program as a vital component of social-emotional learning for our students since the content literally can be life-saving as the topics focus on recognizing and reporting signs of distress, depression and suicide prevention through the application of Acknowledge, Care, Tell (ACT).

All students participate in Physical education classes each of their four years for a duration of ten weeks per year and earn 0.25 credits. Students must participate in Physical Education each year in the state of Massachusetts and participation all four years is needed in order to graduate from the Worcester Public Schools. Currently, there are three Physical Education teachers who teach these courses in our gymnasium. The gym area is divided into three areas: the large gym, and two smaller spaces, one with a few treadmills, and the other with weightlifting areas and cardio machines. The majority of the weights and machines have been donated to the school, and the number of machines and weightlifting stations are insufficient given the number of students enrolled in these courses. The area is not large enough to fully implement the types of course offerings and fitness training that we would like to offer to our students. There is some office space for male and female physical education teachers, but these spaces need to be improved.

The vision for the new school is to substantially increase the size of our gym and the areas adjacent to it in order to increase the array of possibilities for our physical education courses and to better support our successful and well-established athletic programs. The number of teaching stations will increase to five and dramatically improve the space that is dedicated to physical

education and health fitness habits. The office space for these teachers will be improved and expanded. There will be classes in team sports offered in the large gym area with a variety of activities in order to provide our students with options and to differentiate the concepts they are learning in order to meet their diverse needs. Storage space for equipment for these areas needs to be provided. There will be an area dedicated to weight training and conditioning sufficient to accommodate the number of students who wish to participate in these types of activities. Additionally, there will be a space dedicated to classes including but not limited to yoga, Pilates, and mindfulness. As a result of these vastly improved spaces, we also plan to offer personal fitness, cardiovascular fitness, and conditioning courses. Also, we will be able to allow students to participate in additional physical education classes beyond the required, annual ten-week interval which is important to promote healthy habits and necessary for students who are unable to afford a gym membership in the community and for those who cannot stay after school for physical activities or athletics due to other responsibilities such as work or caring for younger siblings.

This expanded space will also support an array of after school programming. Many students participate in weightlifting activities after school. A powerlifting club was started last year and has generated much interest and participation among our students. We also have evidence of a strong interest among our students in yoga as this was offered as a club activity after school and was well-attended by staff and students. We also have had dance clubs who could benefit from this new space after school and the choreography for the musical could be done in this wellness center rather than in the front lobby or in the cafeteria where choreography has been done historically due to a lack of appropriate space. Students will have a voice in selecting activities within which to participate and a wider array of physical activities from which to choose. The improved space will allow us to work with our students to develop the knowledge and skills needed for lifelong wellness, healthy habits for life, strength training and stress reduction.

There are no specialized provisions envisioned for these Physical Education spaces. Rather, they will provide options for the school's various athletic teams and extracurricular groups more appropriate space for a wide range of work and activities. Currently, some teams or groups practice or work in hallways or crowded areas.

Additionally, there needs to be a space for Adaptive Physical Education (PE) as the number of students in need of this service will increase as the new school will be fully handicapped accessible, while currently the school is not. As a result of the lack of accessibility in the current facility, many students who need Adaptive Physical Education attend other schools in the district as their needs cannot currently be accommodated. The Adaptive PE space will be utilized by students receiving special education services. As the program grows, the school hopes to establish and strengthen its unified programming options, thus providing additional opportunities for special and general education students to collaborate.

As the SD process continues, the committee will be designing and including additional information for review.

We are also seeking to add a Unified Physical Education program to build upon our current participation in Special Olympics and to involve our students with disabilities by pairing them with their peers during physical education classes as well as during our after-school programming. This space would also be used to host unified physical education with the younger students in our quadrant, to build and to strengthen the relationships between and among our neighborhood schools, and to increase our participation in Special Olympics especially during vacation and summer school programs.

LPA|A Response: The Health and Physical Education spaces are clustered together on the third level in order to achieve direct exterior access from the locker rooms and gymnasium to the athletic fields. The PE spaces are organized to achieve maximum flexibility and utilization within the area allotted by the MSBA space summary.

Athletics

Our athletic program is extensive, and our athletes are successful. Our students are participants on 49 sports teams sanctioned by the Massachusetts Interscholastic Athletic Association, MIAA: 18 in the fall season, 14 during the winter season, and 17 during the spring. Not only does our participation in athletics support the success of our student-athletes and their ability to compete and to continually develop and improve their skills, both on and off the courts and fields, but it also fosters a strong sense of community, school spirit and pride among our student body, staff and members of the community at large**.** DMHS has a long history of success in athletic competitions and our school has had the highest rate of participation in athletic programming over time in our district as shown in the tables below for all three seasons. (Figures 9-11)

Figure 9

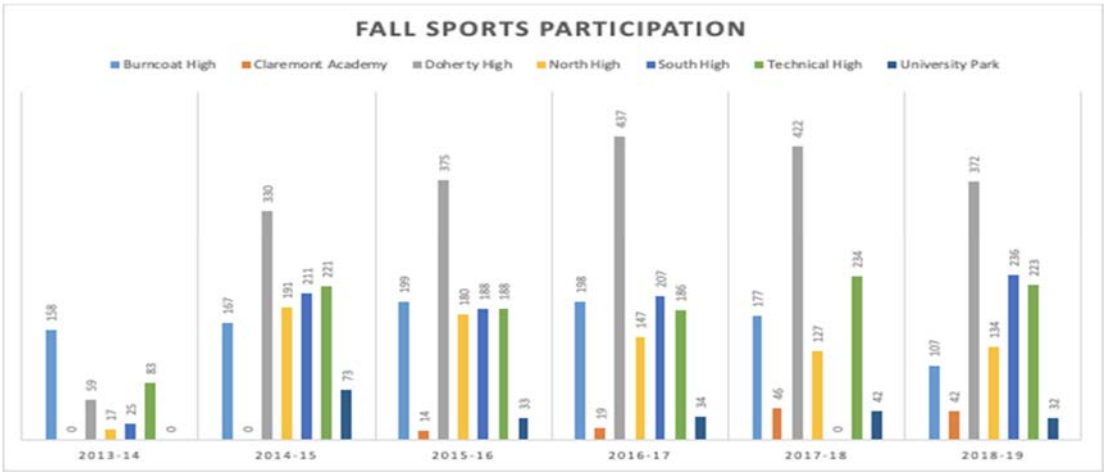

FALL SPORTS PARTICIPATION
Burncoat High
Claremont Academy
Doherty High
North High
South High
Technical High
University Park
158
0
59
17
25
83
0
167
0
330
191
211
221
73
199
14
375
180
188
188
33
198
19
437
147
207
186
34
177
46
422
127
0
234
42
107
42
372
134
236
223
32
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19

Figure 10

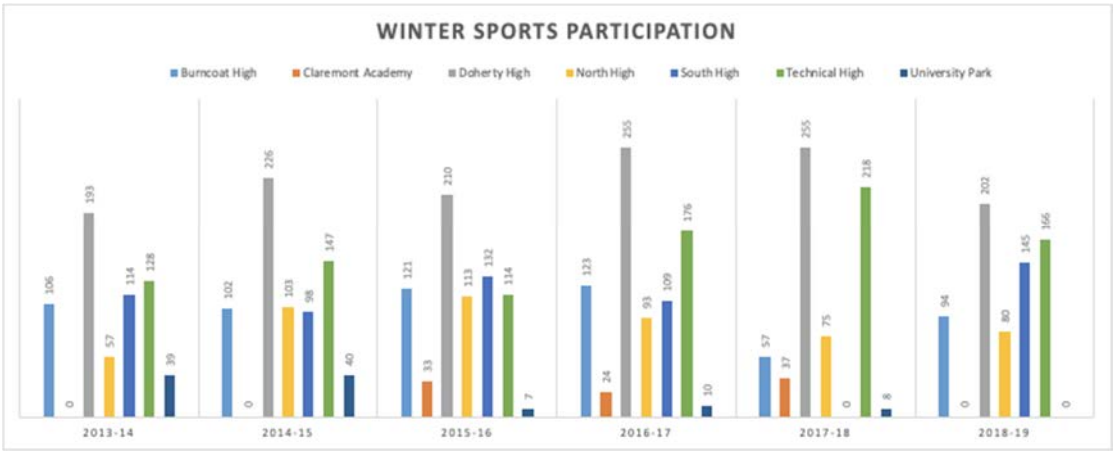
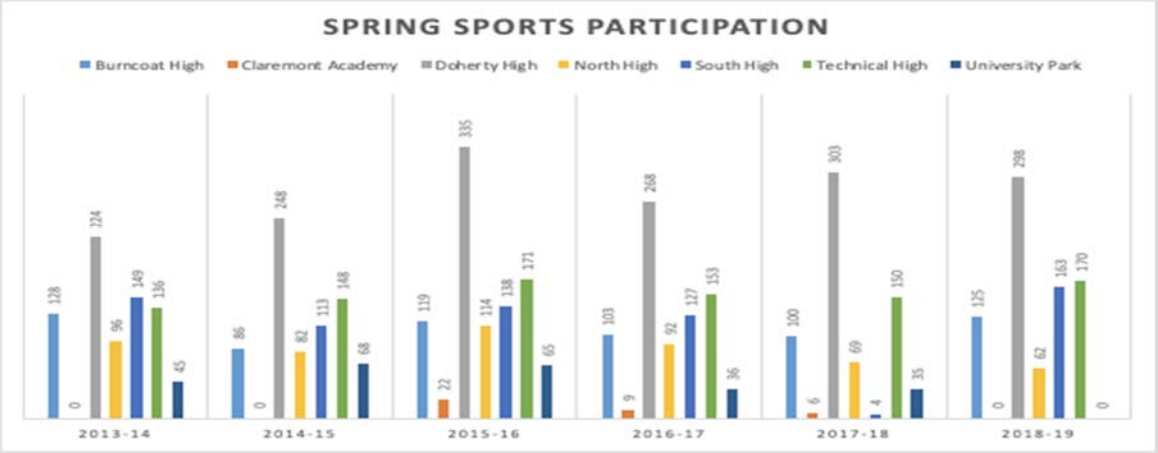

WINTER SPORTS PARTICIPATION
Burncoat High
Claremont Academy
Doherty High
North High
South High
Technical High
University Park
106
0
193
57
114
128
39
102
0
226
103
98
147
40
121
33
210
113
132
114
7
123
24
255
93
109
176
10
57
37
255
75
0
218
8
94
0
202
80
145
166
0
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19

Figure 11



Several of our student-athletes have gone on to participate in athletics at the college, semi-pro, and professional levels. Among our alumni, staff members and coaches, there are many who have been inducted into the Worcester Public Schools Athletic Hall of Fame. However, our current facility does not support the athletic programming in a manner that is both desired and deserved.

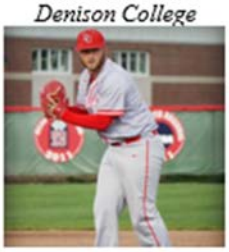
The images below identify some of our recent student- athletes who went on to compete at the collegiate or professional levels.

Figure 12


WHO WILL BE THE NEXT
GREAT HIGHLANDER?
STATE CHAMPIONS
1980
2013
EVAN BRUNELLE
MIAMI
RHAKIM WILLIAMS
UCONN
AARON ADU
TEMPLE
ALFRED ADARKWAH
UMASS/WAGNER
NOAH ROBINSON
MISSOURI
YAWIN SMALLWOOD
UCONN - ATLANTA FALCONS
ISAAC YIADOM
BOSTON COLLEGE - DENVER BRONCOS

Figure 13

Adam Goldstein
Denison College



Evan Brunelle
University of Miami

Tyler Sterner
University of Rhode Island
Drafted by
Cincinnati Reds

Aaron Adu
Temple University

Jewel White
Franklin Pierce College

Wadeline Jonathas
University of South Carolina
(NCAA Champion)

Francesca Hammond
Anna Maria College

Kaiya Saunders
University of Virginia

Rahkim Williams
University of Connecticut

Noah Robinson
University of Missouri
Canadian Football League

Tavian Vassar
Bucknell University

Isaac Yiadom
Boston College
Denver Broncos

Luke Brennan
Salem State University

Yawin Smallwood
University of Connecticut
Atlanta Falcons/Tennessee Titans

During the fall season, the only team who can practice outside on our campus is the football team. This team practices on a non-regulation field that measures approximately 85 yards in length, rather than the 100 yards of a regulation football field on which they compete. The junior varsity and varsity teams practice together which is not an optimal situation. The boys' and girls' varsity and junior varsity soccer teams practice and compete at Foley Stadium and they have to walk there in order to do so. The field hockey team practices on a small patch of land outside of the stadium at Foley Stadium. It is approximately one mile from the school and having the athletes walk from school to the stadium presents an ongoing safety concern. During the fall season our student-athletes also participate in field hockey, cross-country track, boys' golf, crew, girls' volleyball, and cheerleading. During inclement weather many of these groups compete for indoor practice time as our current gym is too small for them to schedule practice simultaneously.

The issues of the inadequate size of our gym are most evident during the winter season when practice is scheduled in two-hour intervals from 2:00 p.m. until 9:00 p.m. During the winter season, our student-athletes participate in boys' and girls' varsity and junior varsity basketball, hockey, swimming, wrestling, cheerleading and boys' and girls' indoor track. From 2014 to 2018, we housed wrestling practice at our school, but that program has since been relocated to another high school within the district due to lack of space despite high rates of participation by our students. This results in the need for the team to travel for practice and competitions. The girls' and boys' track teams both practice in the gym for hurdles, high jump and shot-put but run throughout the hallways of the school as there is no track in our facility. Not only does this practice jeopardize the safety of these student-athletes, but it is also unsafe for any student and/or teacher who has remained after school to walk safely through the building as they go from one location to another or simply exit the building upon the completion of their after school extra help session or club activity. It is unsafe for the night custodians who work from 2:00 p.m. to 10:00 p.m. and/or any school plant employee who may be in the building making repairs so as not to disrupt the school day. There is a dire need for an indoor track, elevated or at ground level, that is at least 133 meters in length to be a part of the new school design to safely accommodate the large number of students, (75 last year), who participate in this sport at Doherty.

During the spring season, our student-athletes participate in varsity and junior varsity baseball and softball, boys' volleyball, tennis, boys' and girls' lacrosse, boys' and girls' crew, and boys' and girls' outdoor track. The boys' volleyball team has limited space within which to practice especially during inclement weather as the softball and baseball teams need to use the net in order to practice indoors safely and the net needs to be removed for volleyball practice and games. To install the net and up then to remove it requires 30 minutes which leads to even less time for the teams. Similar to what occurs during many of the fall sports, the student-athletes who participate in baseball, softball, lacrosse and track have to walk to Foley Stadium or to Beaver Brook Park for practice and/or be driven to other locations for practice, games and competitions. This is an ongoing safety concern. The boys' and girls' tennis teams practice at the public courts at Newton Square adjacent to the school but not on our property.

Despite these conditions, our teams have been and continue to be successful. In 2013, the football team won the state championship at Gillette stadium. That was a wonderful event for the athletes, their families, the students, and our entire school community. Our teams compete and qualify for district play in varsity sports every year and often secure winning titles.

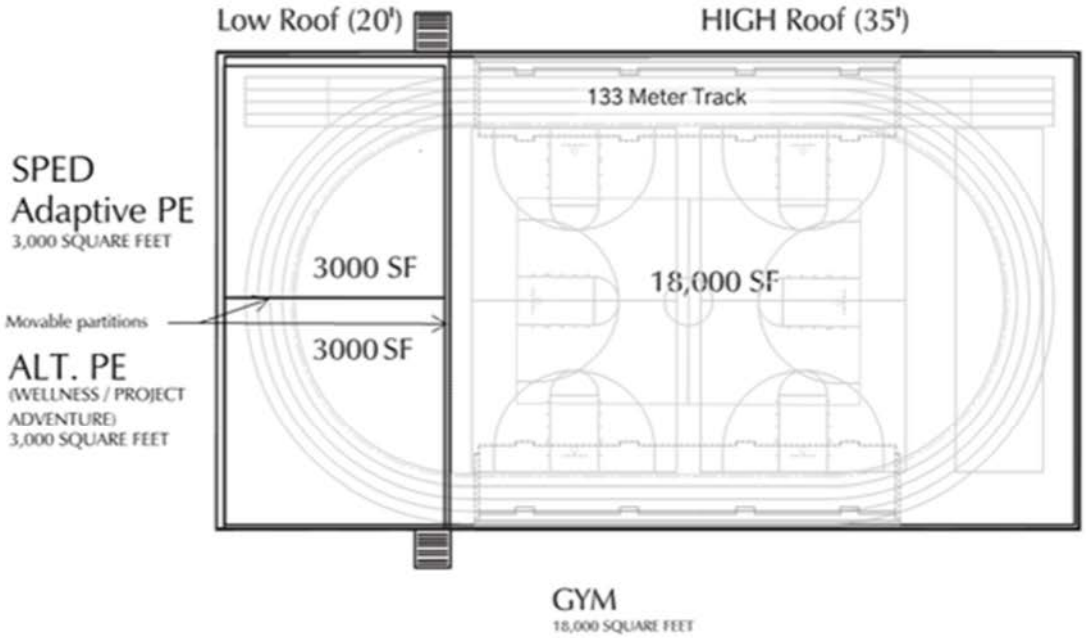
Often, we are forced to disallow large numbers of our fans, students and family members alike, from attending our games due to the inadequate capacity of our gymnasium and the need to respect the limits needed to comply with fire code and to avoid safety concerns that result from overcrowding. Not only does this deny the school and district of much needed revenue for our

sports programs, more importantly it disallows all members of our school community to gather together in order to support our teams.

Equally disappointing, when our students have qualified for home court advantage they have been forced to compete at gymnasiums located in other high schools in the district that are larger but certainly not our "home." The boys' basketball team has been one of the top basketball programs in central Massachusetts for the past 25 years, but they have yet to play a quarterfinal playoff game in our gym due to the attendance rules of the MIAA and the capacity of our facility. This injustice has occurred in 1997, 1998, 2008, 2010, and 2011 and our team has had to find alternate sites to "host" a home court advantage playoff game each time.

The vision for the new facility includes a space large enough for us to gather the entire school population not only for games but for assemblies and academic recognition ceremonies, guest speakers, special events and to provide trainings. There needs to be a way to secure the gym area from the academic areas of the building so it can be utilized as a community space without compromising the safety and security of the building. Currently, we are unable to secure the gym area due to the necessary fire egress so anyone who enters the gym area has access to the entire building which is a concern for the security of the school. Some of the locker room areas, the small gym area and some shower spaces have been converted to be used as a weight room with weights and equipment that have been donated from Good Sports and Planet Fitness. While we appreciate their generosity, the equipment is being used in a less than an optimal space and much of our equipment is less than state of the art. Our students deserve to have a state-of-the-art facility with proper equipment.

In the new facility, we envision our students having space for weightlifting, conditioning, adequate locker rooms for home and visiting teams with showers and white boards, and a wellness center with good sight lines to all areas to ensure the proper supervision of students. We would like to have three full courts to allow more than one team to be able to effectively practice simultaneously. Our physical education classes will also benefit from this improved space as they also need lockers, boys and girls locker rooms and access to showers. There is also a need for storage space for team equipment in addition to storage needed for the equipment used by the Physical Education teachers.



The 3,000 square-foot Wellness Center and the Adaptive PE spaces are planned to be adjacent to the 18,000 square-foot Gymnasium, separated by modular partitions with a lower 20' ceiling. The spaces are organized to support the day-to-day Physical Education program needs within the area allotted by the MSBA. After school hours, the modular partitions may be opened to accommodate a 133-meter indoor track for track practice, for unified sports and for maximum flexibility for the overall school.

Also, we are seeking to add fields in the new facility. The football team would benefit from having a regulation field on site with lights, bleachers, and a press box that could be used for games and practices. The track program would benefit from having a track outlining the football field. The vision includes another 80-100-yard multi-purpose field to be used for soccer and field hockey during the fall season and to be used for lacrosse in the spring and the inclusion of baseball and softball diamonds with bleachers and lights. Finally, the addition of two outdoor basketball courts and two tennis courts would allow us to keep our students on campus and end the practice of having to walk anywhere which we see as a safety concern.

The physical education curriculum throughout the year allows students to explore different athletic and wellness-based activities. Students will engage with these activities, many of which will utilize age-appropriate or industry-standard equipment. When not in use, to ensure safe

storage to prevent damage, as well as to provide an uncluttered space for student safety, this storeroom is critical to provide for an effective Health and Physical Education experience for all students.

All external spaces, including the fields, would be supported with WiFi access.

LPA|A Response: The Health and Physical Education spaces are clustered together on the third level in order to achieve direct exterior access from the locker rooms and gymnasium to the athletic fields. The PE spaces are organized to achieve maximum flexibility and utilization within the area allotted by the MSBA space summary.

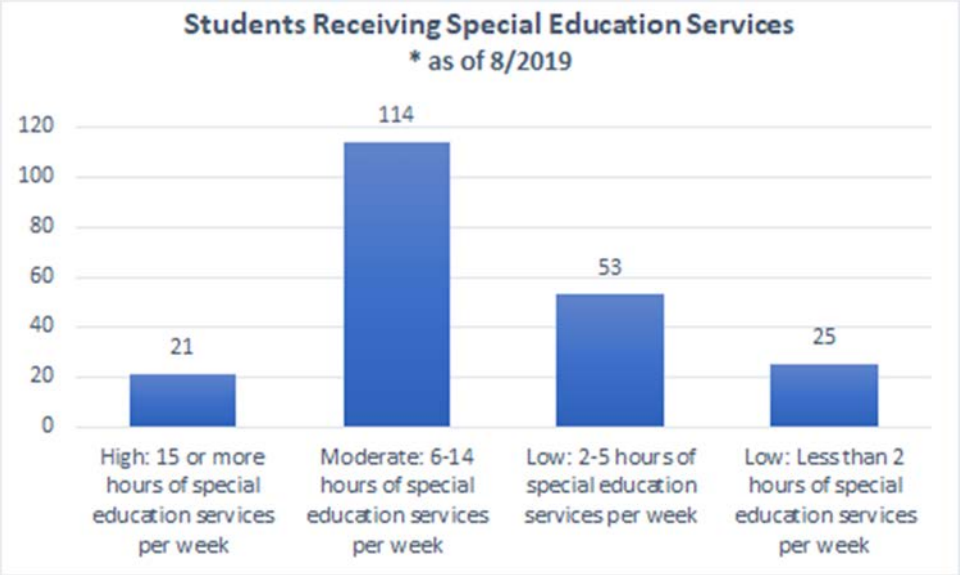
K. Special Education

The mission of the Worcester Public Schools Special Education Department is to provide support, technical assistance and service to schools, staff, students, families and community stakeholders as we work collaboratively to promote safe schools where all children learn. The department is committed to partnering with parents and schools to ensure the fidelity of specialized instruction, inclusion opportunities, professional learning and rigorous outcomes for students with disabilities. Doherty Memorial High School offers a variety of full year (1 credit) courses to support student needs to access the curriculum and to make academic progress. Students receive services in accordance with their Individual Education Plan (IEP). Some students receive classroom services in dedicated Special Education classrooms: resource class, Structured Therapeutic Education Programs (STEP), and Life Skills. Other students are served by the inclusion model (either full or partial) with support in general education classrooms. In addition, some students receive supports such Occupational Therapy, Physical Therapy, Speech and Language therapy, Learning Disability support (LD) or a combination of such supports an indicated in their IEP. Additional supports such as Adaptive Physical Education are taking place in the school's gymnasium.

The curriculum is delivered in the Special Education classrooms using varied, individualized and differentiated strategies to meet the needs of all learners. Instructional methods include whole- and small-group -instruction, modeling of strategies, use of both oral and written use of language, use of manipulatives and other hands-on learning tools, whole- and small-group discussion such as modeling read-aloud and think-aloud skills, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills. While this is the goal in all classes in the Special Education department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis.

Students' IEPs identify specific academic and/or social and emotional needs and these students receive a specific number of hours of support as indicated in their plan. Table 15 indicates the number /hours of students receiving Special Education services as of August 2019. Disabilities currently addressed include autism, communication impairment, intellectual impairment, neurological impairment, emotional impairment, health impairment, and specific learning disability, and/or multiple disabilities. We anticipate this number to grow as the enrollment in the new Americans with Disabilities Act (ADA) compliant school increases and we are able to serve more students with identified needs.

Figure 14



In accordance with Massachusetts education laws and regulations (603 CMR 28.06) students with disabilities, to the maximum extent appropriate, are educated in the least restrictive environment (LRE) and supporting an inclusive environment for students. The Special Education classes at Doherty Memorial High School are not all located exclusively in one area of the building in order for eligible students to maximize their inclusion into the life of the school as noted in the MSBA Special Education Rubric and Regulations. While these classrooms are integrated into the general education classroom areas, they are not integrated as well as they could and should be to support the needs of our students in our current facility. Currently, students with IEPs have access to school facilities including but not limited to implement the students' IEPs. While the present resource rooms and separate classrooms for students with disabilities (STEP, Life Skills) are given the same priority as general education programs, including access to and use of instructional and other space /facilities in the school, this could be

improved to better serve the expanding student population and anticipated needs of future students once when we are in the new school which will be ADA compliant.

Three of our current classrooms that are used for resource rooms are divided into two semi-separate spaces and shared by two teachers. While this may foster some level of collaboration more often it serves as a distraction for students, such as an open classroom concept would do. One of these "shared" spaces is home to two of our three STEP classrooms. The third STEP classroom (104) is located near the music and theater areas and those performances serve as a distraction to students as well.

The clinician, who is an integral member of the team to support the STEP students, is housed in an area that was converted to an office space located near, but not next to the split STEP classroom. We anticipate increasing the number of clinicians to two in the new facility. In order to truly provide support, the clinicians each need a larger space and one that is more centrally located among the current three and anticipated four STEP classroom spaces. These spaces need to be equipped with appropriate technology and be large enough to accommodate meetings with members of the Special Education department, community service providers, parents and students as well as individual and small-group counseling sessions and provide a comfortable safe-space for students in crisis.

The Life Skills students are currently housed in one of the smallest spaces in the school and must enter that space by passing through a different classroom, something that poses a distraction to both the students in the classroom and the Life Skills students. The students in this program need an expanded space to effectively meet their needs and access to additional space to successfully teach the adult learning skills.

The vision for the new school is to have intentionally placed classrooms, sufficient space and learning centers to effectively meet the academic and social emotional needs of our students. We will not add any additional programs nor will we eliminate any current programs. We will maintain the current programming but will be ADA compliant. DESE suggests that instruction group sizes be kept small (ten to twelve students) indicating a need for classrooms that are approximately one half the size of other classrooms in the building but large enough to accommodate this recommended size group with flexible seating to accommodate student and instructional needs, access to technology, using both the distributive and stationary model (desktop computers to meet student needs as identified in IEPs) and adequate storage for materials to support individualized and differentiated instruction. Additional space needs to be dedicated to accommodate the anticipated increased programming and staffing. As we move into a more inclusive model there is a need for more inclusion classrooms and collaborative learning spaces. Additionally, we need a place for the Evaluation Team Chairperson, (ETC) and for the additional clinician that we expect to add to support those students with social-emotional needs.

We anticipate the number of students enrolled in our STEP program to increase necessitating the change from three to four classes given the number of students involved in this type of program currently throughout the district and across the grade levels, K-12.

A conference room is needed to hold IEP and progress meetings to engage the families, team chair, regular and special education teachers in a welcoming and private space to respect confidentiality and the integrity of the team process. A designated, private meeting area needs to be included to hold Special Education meetings with teachers, specialists, and parents. The Special Education Department head requires office space with access to technology and storage for materials to support differentiated and individualized instruction within the department.

The School Psychologist is responsible for psychological testing and evaluation students. The school psychologist, working in conjunction with members of the Special Education departments, in addition to the Evaluation Team Chair (ETC) requires a private, quiet space for testing with access to appropriate technology and meeting rooms for consultation.

Additionally, the ETC needs office/meeting space with access to technology to plan and coordinate student IEP meetings which is in close proximity to Special Education conference room/meeting space in order to facilitate meetings with teachers, school psychologist, adjustment counselors, Special Education teachers, and parents.

With the planned addition of the Grade 9 academy, there will be a need to incorporate Special Education classrooms into this neighborhood to provide appropriate support for these students. In order to support the special education needs we are planning to attach one learning center (resource room) teacher and one inclusion teacher to each of the four Grade 9 academies. For students in Grades 10-12 we plan to have one learning center specialist (resource room) and two inclusion classrooms attached to each of the four major subject areas: ELA, Social Studies, Mathematics and Science in each of the three Grades 10, 11, 12. The special education classrooms and spaces will be integrated into the core academic spaces. This model will allow for flexibility as the numbers of students receiving full inclusion or partial inclusion services change. Common spaces in each of these academies/neighborhoods will be used to support small group instruction as well as pullout instruction provided by special education teachers and other Special Education staff/counselors. We envision a flexible space to provide for multiple orientations and uses, with flexible furnishings to account for current and future needs. Additional departmental and classroom organizational information is available in the proposed adjacency diagrams provided in the PDP.

Multiple settings for small group and individualized instruction and supports, located in the various neighborhoods and in close proximity to general education classrooms will support an

inclusive environment for all students with or without disabilities and promote greater equity and access to instruction and school programs.

We are striving for the most inclusive environment while providing all of the support needed for success and in full compliance with all IEP's which supports the need for additional and flexible space which will allow for grouping and supports. To that end, the District has taken/is taking steps to support this shift to a more inclusive model of instruction. There have been several professional learning opportunities geared toward supporting the success for all students, particularly focused on the delivery of curriculum, instruction, and interventions. Training has been provided at the district and school levels to effectively meet the needs of our Special Education students. The exchange of effective strategies and practices among and between general education teachers and special education teachers is invaluable to inform their co-teaching. The district is committed to continuing to provide training to support the successful implementation of all Individualized Education Plans and to provide the necessary staff to support all Special Education programming including but not limited to inclusion specialists, behavioral specialists, and paraprofessionals necessary to remain within the regulations that govern Special Education in Massachusetts and to educate all students in the Least Restrictive Environment (LRE).

Within each area there needs to be space designated for different levels of special education services/classrooms: full inclusion, partial inclusion, and resource classroom. These classroom spaces will be outfitted, with respect to technology and infrastructure, like all other classrooms in the building, and will follow a consistent room numbering scheme that will be identified later in the design process. Within the Special Education classrooms there needs to be space to allow for flexible grouping including areas for students who need to work one-to-one with a teacher or have a quiet space, free from distractions, to work individually in accordance with the students' IEP. Classrooms need to be equipped with appropriate furniture and equipment to support identified student needs including but not limited to flexible furniture, lavatory facilities, and accommodate spatial requirements as well as acoustical and lighting treatments to remove physical communication barriers for students who are visually impaired, deaf, or hard of hearing. The classrooms also need to have access to technology and use both the distributive technology model as well as stations with desktop computers to support student needs as indicated in the IEPs. Classrooms need to be equipped with appropriate technology including Epson bright link short throw projector, LED display is desired with screens that support both independent or mirroring displays, document camera, Chromecast/apple TV and speech reinforcement. These rooms also need to have adequate and appropriate storage for materials needed for teachers to support differentiated and individualized instruction. No specific signage identifying rooms as "resource room" or "special education' will be used.

Learning Disabilities classrooms need to provide pull-out space, complete with access to technology, for teachers to work with students. We currently have one full-time and part-time LD teacher. With the anticipated increased enrollment in the new school, there will be a need to expand the LD supports to meet the needs of the expanding student population. As a result, an additional LD space will be needed. One such LD space needs to be located in the Grade 9 Academy neighborhood to provide academic support for these students, especially as they struggle to make the transition from middle school to high school.

There needs to be an improved space for Occupational Therapy and Physical Therapy as these services will be expanding as the new DMHS will meet ADA requirements and students whose IEPS indicate that they require these services will no longer need to attend other high schools in the district due to accessibility issues at the current building. A designated space is needed to provide Occupational Therapy for students. This area will provide services for students with identified special needs in fine and perceptual motor skills development. There is a need to support the OT specialist to provide evaluation, consultation and direct services for students. Additionally, there needs to be a space dedicated to providing Physical Therapy services for students with demonstrated special needs in gross motor development. The PT specialist provides evaluation, consultation and direct services to students in accordance to the student's IEPs. A Speech and Language therapy area/classroom is needed to allow the speech pathologist to provide speech and language therapy for students with receptive and expressive language interferences which affect their ability to make effective progress. This area needs to be able to accommodate both individual and small- group sessions. Each of these spaces (OT, PT, and Speech/Language) need to have appropriate access to technology and space for the specialist to store and secure materials.

With the anticipated increased enrollment in the new school there is a need to increase the space needed to service students with these identified needs. The Life Skills classroom needs to be fully ADA compliant with direct grade level access to outside areas to support interaction with the school's outdoor spaces which can enhance instruction through interaction with outdoor educational spaces such as the school garden.

The addition of an Adult Daily Living (ADL) Center to enhance student independence in their living and work environment is an integral part of the plan for the new school. The center would provide an area to support students in the Life Skills class that would teach skills for day-to-day living. This area would need to provide model areas where students can learn such skills as using a washer/dryer, dishwasher, stovetop, oven, and other household appliances, as well as basic work skills. While students would have the opportunity to practice work skills in the school store, the ADL would provide workstations to teach skills needed for working with cash registers, and learning skills such as sorting, folding, labeling, and packing items.

Vocational Learning Center

Vocational training provides students with the opportunity to master the skills needed in order to be successful not only in school but in life. The vision for the new facility is to design learning opportunities for our special education students to engage in real-world experiences throughout the school. The licensed staff will teach and practice the specific job-related skills during their class time and these students will utilize this knowledge both in their classroom and in a variety of locations throughout the building. For example, students may work in the school store, the offices, and help to maintain the school garden. By doing so, they will be prepared to participate in our community as they develop vocational skills needed for their futures.

Study Skills

Study Skills is a course taught by licensed Special Education teachers that is often included as a part of a student's IEP. During this class, students learn note-taking strategies, test-taking tips and skills associated with time management. These skills assist these students in their academic coursework as they are able to apply this knowledge to their other coursework with the support of a special education teacher who can clarify any misconceptions and help students to review and practice using the skills and academic concepts from their other classes. This class time can also serve to allow for extended time for academic tasks as is also often a part of an IEP.

Coping Room

The coping room, designated as the Social Emotional Learning Center, is a space where students can receive academic and social and emotional support. To be assigned to the coping room, students would have received a referral from an administrator for a certain amount of time. During this assigned interval, students would complete academic tasks as assigned by their teachers while also receiving the support and coping strategies and proactive problem-solving skills needed to successfully transition and return to their regularly assigned schedule of classes.

It is not critical for this space to be adjacent to the Media Center.

LPA|A Response: The Special Education spaces required to fulfil the education program are distributed throughout the school in an effort to provide equal access and eliminate stigma. The Life Skills program is located close to exterior access due to egress requirements, and the ADL and Vocational Learning Center are centrally located to serve as a resource for all students.

L. Vocational and Technical Programs

Chapter 74 Programming

With the proposed new Doherty Memorial High School, the Worcester Public Schools is looking to strengthen and expand the Chapter 74 offerings. A formal Chapter 74 Programming Submission was created and submitted to the MSBA.

Doherty Memorial High School currently offers an Engineering and Technology Chapter 74 Program. The goal is to offer three additional trade programs within the new design.

Table 9

Chapter 74 Program Offerings	Current Enrollment	Proposed Capacity	Comment
Engineering & Technology	380	400	Existing Program, space to be expanded
Programming & Web Development	0	160	New Program
Marketing Management & Finance	0	160	New Program
Construction Craft Laborer	0	120	New Program
Total	380	840	

Each vocational program will be available to all students from across the district. Similar to current policy, all Worcester residents in grade 8 will be eligible to apply for admission to any of these four programs. There is no plan to create a ninth-grade exploratory program. Rather, the application will ask students to identify their desired program, and if there are multiple areas of interest to then provide a ranking in order of their preference.

Engineering and Technology

The Engineering and Technology Academy (ETA) vocational program serves students from across the district, and each year has more students applying than the current space can accommodate.

The ETA vocational program was certified 10 years ago and utilizes an approach to integrate the trade skills and knowledge within the academics. Students in the ETA are teamed, meaning they

share the same Engineering, Science, and Mathematics teacher. These teacher blend curriculum, cross-train skills, align standards and expectations, etc. and as such when combined the students are engaging with their vocational curriculum for 3 out of 7 periods of their day. While the vocational program calls for the integrated academics of math and science specifically, our ETA program also teams the Social Studies and English Language Arts classes, resulting in a thematic alignment for almost 70% of the students' day. There are 9th and 10th grade interdisciplinary teams. Doherty does not run a week-on, week-off schedule.

Doherty's schedule includes a 7-period day. Students in the ETA share 5 common classes together, which includes three vocational periods (out of 7) each day. Teachers, including vocational teachers, have 5 instructional classes each day, with a combined maximum student load of 125 students, per the Worcester Public Schools' contract. Due to safety considerations, some classes- including the Engineering classes-are capped so that their enrollment allows for safe access and utilization of the related shop areas. For example, all 9th grade ETA teachers have a maximum load of 100 students (5 classes x 20 students, as 20 is the maximum allowed within this vocation). Thus, at any given time there would be a maximum of 20 students working within any of the vocational or classroom spaces. Combined, there are 100 possible ETA students within each grade for a total of 400 students.

For example, a traditional 9th grade schedule would appear as follows:

Period 1 - English I
Period 2 - Geometry (integrated academics)
Period 3 - Biology (integrated academics)
Period 4 - Introduction to Engineering (vocational)
Period 5 - World History II
Period 6 - World Language
Period 7 - Health, Physical Education

During the school day, Engineering classes run simultaneously for grades 9-12. This results in 2-4 vocational classes running simultaneously during each period of the school day. Given the highly technical nature of the vocational curriculum, students are often accessing the classroom spaces- which would include computers, graphic design software, curriculum resources etc.- along with the vocational spaces each day.

During the school day, Engineering classes run simultaneously for grades 9-12. This results in 2-4 vocational classes running simultaneously during each period of the school day. Given the highly technical nature of the vocational curriculum, students are often accessing the classroom

spaces- which would include computers, graphic design software, curriculum resources etc.- along with the vocational spaces each day.

The ETA program will serve approximately 100 students in each grade – up to 400 total. This comprises approximately 24% of the expected population of 1670 students. Students completing all CVTE requirements receive a technical certificate, in addition to their diploma. Given the complex content knowledge required for work in the career, our primary goal is to provide students with a strong foundation in content knowledge along with skills so that, as students enter college, they are well prepared to continue their engineering/technology education. From a review of local (Massachusetts) and national labor market projections, there is a clear demonstrable need to students to enter this profession, albeit by first earning some level of post-secondary education.

The ETA serves approximately 100 students per grade. This corresponds to a 20:1 student to teacher ratio. In the Worcester schools, teachers are assigned five classes each year, and the ETA currently has four CVTE Engineering teachers. There is no planned change to this enrollment pattern for the new school.

The minimum required laboratory space for a class of 20 students is 2200 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students at the same time. The proposed program will be implemented with four related-theory engineering classroom spaces paired with three shared laboratory spaces. Given the nature of the curriculum, each of the four related-theory engineering classrooms will require a 1:1 desktop computer to student ratio. It is necessary to have desktop computers in this area as the necessary software cannot be run on the Chromebooks. In order for students to engage with the curriculum in a range of rigorous and differentiated learning activities, additional space and furniture is needed for students-when not utilizing the computers-to work collaboratively. The desired classroom/laboratory layout would establish the computer stations together, paired with an educator's desk and presentation space, at one end of the classroom. The other end of the room would include desk/table space, supported by technology, presentation space, wall space, etc. where students can work collaboratively on project-based work in variable-sized groups.

Within this team model, students in the ETA are also receiving vocational instruction within their science and mathematics courses. Thus, the engineering classrooms (four) and associated science and mathematics classrooms that compose the vocational program need to be adjacent to each other. These classrooms are considered related-theory classroom spaces. Based on the teaming models and other factors, the goal within this design proposal is to establish four related theory classrooms with adjacency to the engineering classrooms. Two would serve the Science integration, while two would provide space for the Mathematics.

The Engineering and Technology program's design includes three shop areas. These represent separate, albeit spatially adjacent and accessible, spaces in which different aspects of the vocational curriculum can be implemented. For example, Doherty currently has two-very undersized-shop areas. One houses typical construction and fabrication equipment, used primarily for wood-based projects, including a range of power tools, saws, sanders, drills, etc. The second shop area houses equipment such as 3D printers and fine milling machines. A third major component of the engineering curriculum includes electrical work, including analog and digital circuitry analysis, robotics, programmable logic controllers, etc. Currently, most of this work occurs in a classroom, but this requires staff to reorganize their space when this equipment is needed, e.g. moving computers to the side, setting up equipment, breaking it down each day to account for other classes coming into the space, etc.

Throughout the four years, students are interacting with varied tools and equipment as they engage with the curriculum. Some of this laboratory work is reinforced and strengthened from year-to-year, and so the engineering technology program requires multiple laboratory spaces, each outfitted to support the different skills being developed. These spaces can be accessed and shared by all educators within the program. Current industry and post-secondary trends, and as identified within the curriculum, demonstrate the need for three distinct shop spaces: one to support manufacturing and fabrication skills, such as wood-working or machining; a second laboratory space to support the electrical engineering, circuit design, robotics and programmable logic controllers, and testing; and a third to enable students to engage with 3-D printing, prototyping and CNC technologies. As industry and post-secondary trends change, these three spaces can change and be updated accordingly. During the design phase, adequate ventilation and appropriate safety measures will be provided and accounted for in all necessary spaces.

The three shop areas would allow for dedicated spaces for the three currently designed major vocational skill sets. As industry standards and technologies change in the coming decades, these spaces provide flexibility in the school's ability to deliver the curriculum to such a large population.

To promote professional collaboration and support, the four program classrooms and 3 shared laboratory spaces should be in proximity with each other. Given the numerous and varied consumable materials, tools and equipment needed to effectively implement the curriculum, each laboratory and classroom space needs appropriate storage options. Staff will need a common educator office and planning space. These program classrooms, laboratory spaces, storage and staff spaces should be designed together, and this vocational program will be adjacent to a ninth and tenth grade cluster of academic classrooms. The Engineering Technology vocational program area should also have adjacency to the proposed Construction Craft Laborer vocational program as students and staff will be able to utilize both sets of laboratory spaces as appropriate within the curriculum. In addition, the laboratory spaces should have exterior access so that large

materials, machines or equipment can be delivered and stored or installed. Two of the laboratory spaces (manufacturing/fabrication space as well as the CNC space) should have dust collection systems, and shop sinks.

There are no plans to contract or discontinue the Engineering program at Doherty Memorial High School. Rather, the goal is to create a space that builds upon our existing program in this area, enables students to work safely, with up-to-date technology, and in a space that enables students to work collaboratively in a range of learning activities. The goal is also to provide space so that the class does not have to be broken into groups, each under additional supervision, or to have to identify work-around solutions to the current set of deficiencies as explained in the Chapter 74 Programming Submission.

LPA|A Response: The ETA shops, ETA related classrooms and integrated academic classrooms (including one 9th grade team) are clustered together on the first level, with opportunities for exterior access. The ETA cluster includes a common room and teacher planning spaces, and is in close proximity to the Construction Craft Labor shops.

New Vocational Programs

Doherty is currently seeking Chapter 74 approval for three programs: Programming and Web Development; Marketing, Management and Finance; and Construction Craft Laborer. For each, Doherty has begun to lay the foundation by offering introductory coursework within the curriculum. Doherty intends to add additional coursework and staff to the maximum extent possible so that each program is established as we then transition to the new space.

The three proposed programs will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in each program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed. The table below shows likely course offerings at each grade level.

Sample Student Schedule:

	Grade 9	Grade 10	Grade 11	Grade 12
CVTE	Grade 9	Grade 10	Grade 11	Grade 12

Curriculum	CVTE	CVTE	CVTE	CVTE
CVTE Related Theory (RT)	Grade 9 RT	Grade 10 RT	Grade 11 RT	Grade 12 RT
English	English I	English II	English III	English IV
Mathematics	Algebra	Geometry	Algebra II	Pre-Calculus
Science	Biology	Chemistry	Human Anatomy	Physics
World Language (assume that student needs at least 2 years to be college ready)	Language 1	Language 2 (at minimum, need to start the 2 year sequence in grade 10)	Language 3 (possible)	
Social Studies	World History II	US History I	US History II	
Credit total	7 credits (full schedule)	7 credits (full schedule)	7 credits (full schedule)	5 credits
Additional elective offerings				

Art/Music/ Computer Science/ Theater, other 1 credit electives	None available (unless move language to year 2)	None available	None available	Possible options
AP Classes	AP Human Geography not available (unless move language to year 2)	AP Human Geography, AP Statistics	Some options of an AP class in lieu of their core academic requirement (e.g. AP English Language for English III).	More options available

The Worcester Public Schools anticipates hiring four new teachers to serve all students within each Chapter 74 program. This will correspond to 1 teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. For the 2019-2020 school year, Doherty Memorial High School laid the foundation for each program by offering introductory courses.

Given Doherty's expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of

‘shop’ time followed by another period of related theory supporting the curriculum. This will correlate to one teacher per grade.

At full enrollment, Doherty will offer 4 years of vocational instruction. As an example, below shows a potential teacher schedule within this vocational program and how the space will be utilized. Each teacher will have 2 sections of their respective vocational and related theory courses.

Sample Teacher Schedule (at Year 4)

	Grade 9	Grade 10	Grade 11	Grade 12
Period 1	CVTE Curriculum (sec 1)	CVTE Curriculum (sec 1)	Additional Course	CVTE Curriculum (sec 1)
Period 2	RT (sec 1)	RT (sec 1)		RT (sec 1)
Period 3	Common Planning Time	Common Planning Time	Common Planning Time	Common Planning Time
Period 4	CVTE Curriculum (sec 2)		CVTE Curriculum (sec 1)	CVTE Curriculum (sec 2)
Period 5	RT (sec 2)	CVTE Curriculum (sec 2)	RT (sec 1)	RT (sec 2)

Period 6		RT (sec 2)	CVTE Curriculum (sec 2)	Additional Course
Period 7	Additional Course	Additional Course	RT (sec 2)	

Programming and Web Development

Students enrolled in this program will receive skills training that falls under the Professional and Tech Services industries. The program curriculum includes programming fundamentals, algorithm-based thinking, visual programming and game development, professional applications, robotics, and will include Advanced Placement coursework in Computer Science Principles as well as Computer Science A.

The Programming and Web Development program anticipates serving 160 students- approximately 40 students per grade. This corresponds to approximately 9.6% of the expected population of 1670 students. Chapter 74 regulations outline a 20:1 student to teacher ratio as a maximum. In the Worcester schools, teachers are assigned five classes each year each with an average of 27 students, with a total student load not to exceed 125 students. With a 20:1 ratio, educators within the Programming and Web Development program will not exceed this maximum student load.

Per Massachusetts DESE Chapter 74 policy, “a program designed to provide students with the requisite experience and training to successfully complete the requirements of a Chapter 74 program as outlined in the curriculum frameworks would include at least 900 hours of program-related instruction for each participating student.” Further, this program-related instructional time could be comprised of ‘shop’ time as well as program-related classroom time, referred to as Related Theory coursework in the Worcester Public Schools. Given Doherty’s expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of ‘shop’ time followed by another period of related theory supporting the curriculum.

As students are engaging in a double-block of vocational and related theory work, Programming and Web Development program will include 4 classroom/laboratory spaces. Each space will

include 1:1 desktop computers, as industry-standard software programs supporting this curriculum are not supported on Chromebook devices.

The Programming and Web Development program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Programming 1 and Related Theory 1, and a 10th grade student will enroll in Programming 2 and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 11th grade schedule would appear as follows:

Period 1 - English III
Period 2 - Pre-Calculus
Period 3 - AP US History
Period 4 - Programming and Web Development 3
Period 5 - Prog. and Web Dev. Related Theory 3
Period 6 - World Language
Period 7 - AP Physics 1

The Worcester Public Schools anticipates hiring four new teachers to serve all students within this program. This will correspond to 1 teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. For the 2019-2020 school year, Doherty Memorial High School laid the foundation for this program by offering introductory courses in Information Technology. With the addition of one teacher for 2019-2020 school year, Doherty students can capitalize off their skills and industry knowledge as the program gains momentum.

A team, supported by the Programming and Web Development Advisory Council, will develop the 4-year curriculum. This team will include Doherty Memorial High educators, students, guidance and administrative staff. This curriculum development work will take place during the 2019-2020 school year and will have an expected completion date of May 1, 2020.

As part of this curriculum sequence, students will partner with district Information Technology personnel to gain practical knowledge and skills. The new school design will include space to house computer-support devices, servers, network hubs, and related technological infrastructure. Students within this trade program will learn about the varied hardware and software within, and exterior tools that support the school. District IT personnel will be able to train students as they

maintain and service the technological infrastructure. During their academic and vocational coursework, students within the Programing and Web Development course will therefore gain valuable career readiness skills from current professionals.

It is traditionally difficult to use high-school interns due to the commute time for interns to travel to the networking office. By housing the school networking infrastructure at Doherty interns from the vocational program would be able to work with IT during the school day as well as afterschool, thereby receiving real world experience troubleshooting issues as they occur. Students would gain experience in IP addressing, network troubleshooting wireless spectrum analysis, user account maintenance, and more.

The minimum required laboratory space for a class of 20 students is 2200 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students at the same time. The proposed program will be implemented with four combination laboratory space/classrooms. Given the nature of the curriculum, each laboratory space will require a 1:1 desktop computer to student ratio. In order for students to engage with the curriculum in a range of rigorous and differentiated learning activities, additional space and furniture is needed for students-when not utilizing the computers-to work collaboratively. The desired classroom/laboratory layout would establish the computer stations together, paired with an educator's desk and presentation space, at one end of the classroom. The other end of the room would include desk/table space, supported by technology, presentation space, wall space, etc. where students can work collaboratively on project-based work in variable-sized groups.

To promote professional collaboration and support, the four program classrooms/laboratory spaces should be in proximity with each other. These four classrooms can be supported with a centralized storage room as well as a common educator office and planning space. While these program classrooms, storage and staff spaces should be designed together, there is then no required adjacency to any other program within the school.

The Programming and Web Development program proposal seeks four classrooms and two teacher offices. The teacher offices will be shared spaces between the four program teachers.

LPA|A Response: The Programming & Web Development related classrooms/labs are clustered together, and share a "pod" with the Marketing Management and Finance program.

Construction Craft Laborer

The Construction Craft Labor pathway provides training for all students in all areas of the construction field, including carpentry and framing, rigging, blueprint reading, and masonry. Students will work with all types of hand tools, power tools to build projects.
The Construction Craft pathway provides hands on training for students in the Construction Industry with opportunities to work in the fields of carpentry, construction, masonry, and tile setting, among others.

Skills training received in this program fits the Construction Industry and Occupations. These occupations (so called 'hard trades') include Apprenticeship trades, high employer need and engagement, strong wages and require little formal education and therefore present low barriers. Workers in these trades are often affiliated with organized labor unions and employer sponsored associations offering apprenticeship opportunities leading to post-secondary education and portable industry credentialing. Additionally, as evidenced by the employer survey conducted for the Central MA Regional Blueprint, entry level laborer is the number one occupation facing significant employee/candidate shortages.

The Construction Craft Laborer program anticipates serving 120 students-approximately 30 students per grade. This is close to 7.2% of the expected population of 1670 students. Chapter 74 regulations outline a 15:1 student to teacher ratio as a maximum. In the Worcester schools, teachers are assigned five classes each year each with an average of 27 students, with a total student load not to exceed 125 students. With a 15:1 ratio, educators within the Construction Craft Laborer program will not exceed this maximum student load.

The Construction Craft Laborer program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Construction 1 and Related Theory 1, and a 10th grade student will enroll in Construction 2 and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 11th grade schedule would appear as follows:

Period 1 - English III
Period 2 - Pre-Calculus
Period 3 - US History 2
Period 4 - Construction 3
Period 5 - CCL Related Theory 3
Period 6 - World Language
Period 7 - Physics

The Construction Craft Laborer program proposal seeks two classrooms and two teacher offices. The teacher offices will be shared spaces between the four program teachers. In addition, the shop area will enable students to transfer theory to practice within this versatile space.

Per Massachusetts DESE Chapter 74 policy, "a program designed to provide students with the requisite experience and training to successfully complete the requirements of a Chapter 74 program as outlined in the curriculum frameworks would include at least 900 hours of program-related instruction for each participating student." Further, this program-related instructional time could be comprised of 'shop' time as well as program-related classroom time, referred to as Related Theory coursework in the Worcester Public Schools. Given Doherty's expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of 'shop' time followed by another period of related theory supporting the curriculum.

As students are engaging in a double-block of vocational and related theory work, the Construction Craft Laborer program will include four related-theory classroom spaces as well as a common shop space for the practice and development of physical skills.

The Worcester Public Schools anticipates hiring four new teachers to serve all students within this program. This will correspond to one teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. In preparation for the development and expansion of this program, Doherty Memorial High School has begun offering courses that align with some of the vocational standards, especially those within Strand 4 (Employability and Career Readiness Knowledge and Skills) and Strand 5 (Management and Entrepreneurship Knowledge and Skills). For example, the school is now offering College and Career Readiness courses that, in part, enable students to "participate in a variety of experiences that will assist them in the development of personal, academic and career/vocational skills." For the 2019-2020 school year, Doherty Memorial High school hired personnel to offer and expand these elective course offerings to students. This course curriculum will serve as the foundation for students entering the Construction Craft Laborer program.

A team, supported by the Construction Craft Laborer Advisory Council, will develop the 4-year curriculum. This team will include Doherty Memorial High educators, students, guidance and administrative staff. This curriculum development work will take place during the 2019-2020 school year and will have an expected completion date of May 1, 2020.

The minimum required laboratory space for a class of 15 students is 3375 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students at the same time. The proposed program will be implemented with two shared classroom spaces,

two teacher offices, and one large shared laboratory space. Given the nature of the curriculum, each traditional classroom space, would allow students to engage in group work, perform calculations, learn related theory, etc. This space would also support the student use of available, existing Chromebook technology. The adjacent laboratory space would then enable students to acquire practical skills within the trade. Given the varied range of tools and equipment, along with the varied project, hands-on work expected within the curriculum, the laboratory space will need to be versatile. Laboratory spaces will require shop sinks. During the design phase, adequate ventilation and appropriate safety measures will be provided and accounted for in all necessary spaces.

The Construction Craft Labor is the only program proposed that requires a shop ceiling height greater than a typical classroom. Layout efficiency will be considered when locating this shop within the building.

To promote professional collaboration and support, the two shared classroom spaces, two teacher offices, and one large shared laboratory space should be in proximity with each other. Given the numerous and varied consumable materials, tools and equipment needed to effectively implement the curriculum, each laboratory and classroom space needs appropriate storage options. Staff will need a common educator office and planning space. These program classrooms, laboratory spaces, storage and staff spaces should be designed together, and this vocational program should be adjacent to the Engineering Technology vocational program area, as students and staff will be able to utilize both sets of laboratory spaces as appropriate within the curriculum. In addition, the laboratory spaces should have exterior access so that large materials, machines or equipment can be delivered and stored or installed.

There is no redundancy in trade programs within Doherty, i.e. no duplication of equipment, tools, or space. For example, several other vocational schools who implement the Construction Craft Laborer program also implement a range of other construction trades, including carpentry, welding, HVAC etc. For example, Medford Vocational Technical High School currently implements the Construction Craft Laborer vocational program for students. Medford also offers vocational programming in related trades including Carpentry, HVAC, and Metal Fabrication and Joining Technologies. These programs, including their equipment, staff, and space, are able to mutually support each other. Medford, and other similar schools, rather than duplicating the space and equipment needs for Construction Craft Laborer and the other trades, have the option to work collaboratively to share the available resources. For example, when students in the Construction Craft Laborer program focus on the development of their welding skills, they are able to utilize the equipment and laboratory space in the Metal Fabrication and Joining Technologies program.

In contrast, the New England Laborers, in conjunction with the Cranston, RI Public Schools, designed and built the Construction Career Academy. In 2002, this facility opened and implements the RI vocational construction craft curriculum. As a stand-alone facility, with no other related shop spaces offering mutual support, almost 7200 square feet is dedicated to the effective implementation of the curriculum.

With the current and proposed CVTE programs for Doherty Memorial High School, there are no related shop areas that would allow for shared spaces and/or equipment. With Doherty's current and anticipated bell schedule, there would be times throughout the day where multiple Construction Craft Laborer classes are simultaneously being run. Each individual class would be limited to 15 students, but with a total planned enrollment of 120 students there would likely be multiple needs for the classroom and related shop spaces.

Therefore, Doherty is planning for a shop space larger than the minimum 3375 square feet. The 4 associated related-theory classrooms would have adjacency to this shared shop space. The planned common shop space will encompass approximately 5000 square feet. The perimeter of this shop will include stations, with each focusing on a different skill set and providing space to utilize the equipment associated with that facet of the trade. As there are no redundant programs elsewhere in Doherty, these stations will be designed and equipped to ensure the needs of all vocational curriculum standards and competencies will be met.

While there are no related areas for the Construction Craft Laborer students to utilize, there would be ample opportunities for other school and community programs to benefit from the skills, equipment, space, and practical experiences of the Construction Craft Laborer program.

LPA|A Response: The CCL shop, related classrooms, storage and teacher offices are clustered together on the lowest level, with exterior access opportunities.

Marketing, Management and Finance

We currently offer CTE courses in Marketing and Business Doherty Memorial High School offers full year (1 credit) courses in Marketing I and II, Exploring Business Systems, Introduction to Business Systems and Accounting, all of which are scheduled for a 1-period block. In these courses students gain an overview of business operations and acquire computer application and presentation skills, learn essential communication skills applied to business development, entrepreneurship, management, career development and employability.

We are seeking to expand this CTE pathway to be approved as a Chapter 74 Marketing, Management and Finance CVTE certified program. CVTE programs can have a range of benefits

including higher rates of college enrollment, and enhanced career skills and increased earnings as indicated by labor market research. The vision for the new building is to continue to grow these programs in a space with access to technology and hands-on opportunities for students to increase their understanding of the field.

This proposed vocational program provides skills training that fits with the Retail/Hospitality industry, which combined is the region's second largest employment sector (19.5%). Marketing has evolved with the changes that the internet has brought to business. Professionals working in the marketing industry must be well rounded in sales, management, advertising, customer service, cultural diversity, and both qualitative and quantitative analysis. While no nationally-recognized credential is available for these skill sets, students can earn the following industry recognized credentials:

- Occupational Safety and Health Administration (OSHA) – Ten-hour General Industry
- Certification • National Retailers Federation Customer Service Certification

The Marketing, Management and Finance program anticipates serving 160 students, or 40 students per grade. This corresponds to approximately 9.6% of the expected population of 1670 students. Chapter 74 regulations outline a 20:1 student to teacher ratio as a maximum. In the Worcester schools, teachers are assigned five classes each year each with an average of 27 students, with a total student load not to exceed 125 students. With a 20:1 ratio, educators within the Marketing, Management and Finance program will not exceed this maximum student case load.

The Marketing, Management and Finance program will not utilize a team approach, as does the Engineering and Technology Academy. Instead, students in this program will engage with the curriculum and related theory by enrolling in 2 periods during each school day. For example, a 9th grade student will enroll in Accounting 1 and Related Theory 1, and a 10th grade student will enroll in Marketing and Related Theory 2. The remainder of their schedule (5 periods) will include their academic and any other desired elective or mandated courses as needed.

For example, a traditional 10th grade schedule would appear as follows:

Period 1 - English II
Period 2 - Geometry
Period 3 - US History 1
Period 4 - Marketing I
Period 5 - Marketing Related Theory 2

Period 6 - World Language
Period 7 - Chemistry

Per Massachusetts DESE Chapter 74 policy, “a program designed to provide students with the requisite experience and training to successfully complete the requirements of a Chapter 74 program as outlined in the curriculum frameworks would include at least 900 hours of program-related instruction for each participating student.” Further, this program-related instructional time could be comprised of ‘shop’ time as well as program-related classroom time, referred to as Related Theory coursework in the Worcester Public Schools. Given Doherty’s expected bell schedule and with the length of each instructional period, this proposed program anticipates two periods of program-related instruction each day: one period of ‘shop’ time followed by another period of related theory supporting the curriculum.

As students are engaging in a double-block of vocational and related theory work, the Marketing, Management and Finance program will include one School Store (which will act as a shop space) and three classroom/laboratory spaces. Each space will include 1:1 desktop computers, as industry-standard software programs supporting this curriculum are not supported on Chromebook devices. Students will transfer these skills from the classroom to practical settings. The goal within this design process is to develop a School Store that supports students and builds culture, but that also empowers students as the School Store will be managed by students within this trade. Similarly, as the program curriculum is developed and sequenced, the advisory team will expand the outreach and practical application opportunities for these students further into the school and community. For example, vocational students can oversee some of the logistical operations within the Doherty Cafe.

The Worcester Public Schools anticipates hiring four new teachers to serve all students within this program. This will correspond to one teacher per grade, with each teacher implementing lessons that enable students to engage with the vocational, as well as the related theory curriculum. For the 2019-2020 school year, Doherty Memorial High School laid the foundation for this program by offering introductory courses in Accounting and sections of Introduction to Business. With the hire of 1 teacher for this coming school year, Doherty students can capitalize off their skills and industry knowledge as the program gains momentum.

A team, supported by the Marketing, Management and Finance Advisory Council, will develop the 4-year curriculum. This team will include Doherty Memorial High educators, students, guidance and administrative staff. This curriculum development work will take place during the 2019-2020 school year and will have an expected completion date of May 1, 2020.

The minimum required laboratory space for a class of 20 students is 2200 square feet. There will be four educators, and at times throughout the school day all four will be engaging with students at the same time. The proposed program will be implemented with three combination laboratory space/classrooms and two shared teacher offices. With the inclusion of the school store, students will be able to share the classroom spaces with the store as an extension of their shop space. Given the nature of the curriculum, each laboratory space will require a 1:1 desktop computer to student ratio. In order for students to engage with the curriculum in a range of rigorous and differentiated learning activities, additional space and furniture is needed for students-when not utilizing the computers-to work collaboratively. The desired classroom/laboratory layout would establish the computer stations together, paired with an educator's desk and presentation space, at one end of the classroom. The other end of the room would include desk/table space, supported by technology, presentation space, wall space, etc. where students can work collaboratively on project-based work in variable-sized groups.

To promote professional collaboration and support, the three program classrooms/laboratory spaces and the school store should be in proximity with each other. These ~~four~~ three classrooms can be supported with a centralized storage room as well as a common educator office and planning space.

In addition, students will benefit from shared spaces within the Visual Arts department, for example as they design displays within their Marketing classes. The store will provide a space to account for many school needs, and students will be able to coordinate and supply these needs. For example, the store will provide a venue to offer school-branded merchandise for students, families, and community members. This will provide real-world opportunities to apply their vocational skills as they design the products and related advertising, as well as have opportunities to interact with peers and adults in a professional atmosphere.

In addition, one of the goals of the vocational program is to provide opportunities for students to experience practical applications of the curriculum. This will be accomplished through vocational internships or coops in the community for students in the upper grades, but will include in-school opportunities as well. The Marketing, Management and Finance vocational program should have an adjacency to, or be in proximity with, the proposed school store. Students will be able to manage all aspects of this store, such as budgets and financial transactions, inventory control, marketing and awareness campaigns, personnel tracking, etc. In addition, the new Doherty design includes a cafe, and this provides another school-based, student-centered and led enterprise.

LPA|A Response: The Marketing Management and Finance related classrooms/labs are located in close proximity to the School Store and share a "pod" with Programming & Web Development classrooms. This pod is adjacent to the pod containing the Visual arts Classrooms.

CTE and College/Career Pathway Programming

Television Production

Doherty Memorial High School currently offers a CTE programming pathway in Television Production. Doherty's Television (DTV) program offers students a 2-year sequence of courses. At this time, the DTV studio consists of a repurposed closet and storage room, along with a portion of a subdivided classroom. The current television studio at Doherty High School is approximately 350 square feet of renovated closet and storage space. The space is split into 2 rooms. There is a 225 square foot recording studio with insufficient overhead lighting and a green/blue backdrop unit for chroma-key recording. The second room, approximately 125 square feet, is used for editing. There are currently four desktop computers installed with power director software. The class utilizes 3 small Sony HD video cameras, a 4k Sony video camera, and two DSLR still cameras. All of the computers and cameras were obtained via fundraising, either in school or through community and crowd-funding based platforms. There has not been any funding of this equipment or studio since its last major upgrade in 2010.

The proposed new school facility would include a modernized space for students to engage with the curriculum. A modernized Television Production studio should include a space for film editing, enhancements, and would house computers and other specialized production equipment. Adjacent to this is the film studio. In addition, the space would have desks/chairs/tables for student use as they collaborate, conduct academic discourse, plan their productions and segments, receive journalism and production instruction, and engage in other varied learning activities. Current Massachusetts DESE Chapter 74 guidelines states that a Radio and Television Broadcasting vocational program would have a minimum space of 2500 square feet, providing 125 square feet of space for each of the 20 students working within the program. While Doherty's Television Production programming pathway is not vocational, these DESE guidelines provide a sound baseline when designing a modernized, industry-standard program. Ideally, this studio would be located adjacent to the media center with green/blue screen capabilities and updated HD or 4K cameras, communication and recording equipment, desktop computer editing software, and the ability to broadcast throughout the school through multiple display areas.

LPA|A Response: The Television Production space will be integrated into the Media Center suite, which will be developed further in future design phases.

Computer Science

The Massachusetts Curriculum, Frameworks for Digital Literacy and Computer Science state that "digital literacy and computer science knowledge, reasoning, and skills are essential both to prepare students for personal and civic efficacy in the twenty-first century and to prepare and inspire a much larger and more diverse number of students to pursue the innovative and creative careers of the future. The abilities to effectively use and create technology to solve complex problems are the new and essential literacy skills of the twenty-first century" (p.7). These frameworks focus on four key domains: Computing and Society, Digital Tools and Collaboration, Computing Systems, and Computational Thinking. Students gain proficiency by integrating practices necessary to succeed in an ever-increasing technological world.

Doherty Memorial High School offers full year (1 credit) courses. The current 1-credit course offerings include Computer Science I, Computer Science II, and Introduction to Computer Programming and Advanced Placement Computer Science Principles, all of which are scheduled for a 1-period block. All of these Computer Science course offerings are non-CVTE electives. During the 2018-2019 school year, there were three sections of AP Computer Science Principles scheduled, serving a total of 70 students. Doherty will also offer the AP Computer Science A course during the 2019-2020 school year.

The Computer Science department is currently a part of the Mathematics Department. There are two rooms predominantly utilized for computer science courses and while these classrooms are adjacent to each other, they are not in close proximity to the majority of the mathematics classes. Both computer science classrooms have desktop computers, and the number of computers is maximized based on the safe availability of electrical connections. It is necessary to have desktop computers in order to utilize the programming software which cannot be supported on the Chromebooks. There are also a set of tablet-arm chairs available in each classroom, as non-computer science courses also are offered in these spaces due to the current lack of available classroom space for other courses.

Neither computer science classroom is designed to effectively support a 21st century STEM curriculum. The physical layout of these rooms discourages effective grouping practices, collaborative work, and flexibility. The computers are arranged on the perimeter walls, based on the pre-existing locations of the electrical outlets. Most students are not able to monitor the teacher's work, demonstrations, etc. without being able to face their desk and/or device.

Currently, Computer Science classes are sometimes taught by Mathematics teachers, as these staff members tended to have skill sets and/or licensures in both areas. However, the Mathematics Curriculum Framework (2017), as well as the Digital Literacy and Computer Science Curriculum Framework (2016) are distinct curricula and with the coming inclusion of Computer Science as a graduation requirement, coupled with its growing popularity, DMHS may choose to group the Computer Science teachers into their own department. The Vocational Programming and Web Development program teachers will be organized within the larger CVTE department, and not within the Computer Science and/or Mathematics department(s).

DMHS has a seven-period day, with no rotation or dropped periods. Each classroom is then available for use for seven periods each day. Therefore, there are fourteen instructional periods available in a room outfitted to some degree to support a computer science/programming curriculum.

During the 2018-2019 school year, there were two FTE staff members. Most teachers within the department provided computer-based instruction, though one had a general, non-departmentalized elective course as part of their assignment. In total, these staff provided a combined ten instructional periods of mathematics and general electives. In addition, there were several other non-mathematics classes scheduled into these rooms, due to the available space. For the 2018-2019 school year, these twelve 'computer' rooms had a combined usage rate of 86% (twelve used periods out of fourteen available periods).

With the addition of new staff members to the department this year, and the addition of new courses, there is a lack of available classroom space within the computer science area, requiring classes to be scheduled in available rooms outside of the department area. This poses additional scheduling challenges as certain courses require specific software necessitating the use of desktop computers. As enrollment increases and the department continues to grow with additional staff and course offerings, the school will be challenged to find appropriate classroom space to meet these needs

The vision for the computer science courses in the new building includes additional classrooms with advanced technology to support changes and trends in the growing field of computer science. With the anticipation of computer science becoming a graduation requirement in Massachusetts in the near future, there is a need to include flexibility to add more classes and have additional staff to meet this need. This will require consideration in the planning to meet the technical and electrical needs to support the expansion of this department and the ability to make changes to meet the advances in this rapidly growing field.

LPA|A Response: Three Computer Science classrooms are located adjacent to the ETA Neighborhood

Innovation Pathways Program (IPP)

The Innovation Pathways Program was developed to help expand career field exploration through technical education within the Worcester Public Schools. Students participating in the program will experience an in-depth look at a career field of their interest; work towards industry recognized credentials in that area; engage in college and career planning activities; and gain experience through a summer internship or a capstone project. Worcester Public Schools has worked with many organizations and businesses to develop a program that meets the needs and interests of students as well as future labor market demands. We are proud partners with: MassHire Central Region Workforce Board, One8 Foundation, and the Worcester Regional Chamber of Commerce and Business Partners. The IPP coordinator will need an office space to meet with students in the new school design.
(Appendix C)

Dual Enrollment/Early College

Students who wish to pursue advanced or specialized courses beyond those offered at the school may take courses at area colleges including Assumption College, Becker College, College of the Holy Cross, Quinsigamond Community College, and Worcester State University. With our district's participation in Early College, our students have additional opportunities to take courses through Quinsigamond Community College and Worcester State University both at the college campus locations and at our own school. The Early College/Dual Enrollment Coordinator will require an office space in the new facility. (Appendix D)

Internships/Community Service

During the 2019-20 school year, we have been fortunate to add a full-time internship coordinator to our staff. The addition of this position has allowed us to expand the learning opportunities for students to extend beyond the walls of our school and beyond the school day. This teacher is responsible for developing and monitoring our students who are involved in internship opportunities that vary in nature, throughout our community. Additionally, although many members of our staff help to engage our students in community service projects, the addition of this position allows us to have a central location within which to organize and schedule this type

of community involvement while increasing the breadth and depth of our participation. Currently, there is an office space afforded for this purpose in order to meet with students and we envision an office space in the new facility.

Virtual High School (VHS)/Edmentum

Consistent with our school and district's mission statements, the mission of the Virtual High School is to provide students and teachers with collaborative and engaging learning opportunities and the vision is to prepare students to be successful in college, careers and life. Students and teachers at our school participate in the virtual high school program and have been involved in this program for many years. Virtual High School allows our students to participate in courses that we may not offer at our school and/or to take a course online that may not have been able to fit into their schedule. Students who participate in these courses receive support their progress is monitored by our staff. Similarly, our students use the Edmentum online platform to engage in coursework for which they may need to recover credits and/or need additional time for course mastery. Participation in this online learning helps students to achieve academically and contributes to college and career readiness. Currently, the online learning coordinator has an office space in order to meet with students and will need office space in the new facility in order to be able to continue to offer online options for our students.

LPA|A Response: Office space for these specialized staff will be included within the Guidance Suite.

M. Description of Core Academic Educational Activities
Table 10

English Language Arts	ELA is a graduate requirement in the Worcester Public Schools and all students in Grades 9-12 take ELA each year. Students will gain mastery of a range of skills and applications so that they can read, comprehend and analyze increasingly rigorous literary texts representing a variety of genres, cultures, and perspectives. They will draft and edit clearly written and logically organized arguments, informative/explanatory, critical, comparative, and analytical essays, and narratives using evidence from texts and for a range of purposes, emphasizing clear, logical writing patterns; word choice; a variety of rhetorical strategies; and use of literary conventions and stylistic devices. Students utilize technology to research, write and publish their work. They participate in large- and small-group collaborative discussions and use the conventions of the English language correctly. Journalism and Creative Writing are offered as elective classes. Academic Literacy is a support class for students who need a double dose of ELA. Students who excel in the subject and have an interest in exploring literature and honing their rhetorical skills are encouraged to participate in AP Language and Composition and /or AP Literature and Composition.

Mathematics	Math is a graduate requirement in the Worcester Public Schools and all students in Grades 9-12 earn four credits in mathematics including Algebra 1, Geometry, and Algebra 2. The mathematics program provides opportunities for all students to interpret and persevere in solving real world, complex mathematical problems using strategic thinking. Students will be effective communicators and collaborators who construct viable arguments and critique the reasoning of others in order to make decisions, draw conclusions and solve problems. The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole- and small-group instruction, collaborative activities, hands-on, project-based lessons, modeling of strategies, integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom space often impacts the ability two fully implement these strategies/activities on a more frequent basis. Technology is integrated into the curriculum and students make use of graphic calculators, and Chromebooks to support individual and collaborative activities. Upper level classes such as Statistics allow students to apply the problem-solving skills they have acquired to real-life situations and focus on probability, analyzing numerical data, statistical studies, using recursion in models and decision making, using functions in models and decision making, decision making in finance, and networks and graphs. Courses such as AP Statistics, AP Calculus AB and AP Calculus BC rely incorporate technology such as graphing calculators and challenge students to learn through discovery.

Science	Three credits of Lab Science are a required graduation requirement for all students. Courses provide students with opportunities for in-depth exploration of the standards identified in the Massachusetts Curriculum Frameworks. The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, procedures and experimentation, whole- and small-group discussion, collaborative activities, project-based exploration of topics, laboratory experimentation, and the integration of technology using the distributive technology model. While this is the goal in all classes in this department, limited classroom and laboratory space often impacts the ability two fully implement these strategies/activities on a more frequent basis. Students in lab science classes will conduct lab investigations, collect and analyze data, and explore content information from a variety of texts and media sources. Students who have a deeper interest in exploring specific aspect of science may opt to take Human Anatomy, AP Biology, AP Chemistry, AP Environmental Science and/or AP Physics. Science courses utilize dedicated laboratory space, flexible seating/grouping, as well as collaborative laboratory activities, small- and large-group class discussion and modeling of procedures, and results. Teachers incorporate technology into their classes as students use computers for research, collaboration and sharing.

Social Studies	Three credits in Social Studies (World History II, United States History I and II) are required for graduation. The Social Studied department has high expectations that all students will understand the political, social, economic, historical and legal developments throughout human history by guiding them to be critical thinkers, analytical readers, thoughtful communicators and independent learners. Educational activities implemented in the department include but are not limited to the use of differentiated instructional, whole-and small-group -instruction, modeling of strategies, whole- and small-group discussion including Socratic Seminars and debates, collaborative activities, project-based learning activities, and the integration of technology to support research skills, analysis of historical perspectives and cause and effect. These skills build upon critical reading (texts and primary and secondary source documents, charts, maps, and visuals) and thinking skills. Students are asked to analyze documents in order to prove their thesis in Document Based Questions (DBQ). Cross-disciplinary collaboration between Social Studies and English departments support the use of these skills. Students may choose to take one of the social studies electives: Legal Aspects, Psychology, and Sociology. Advanced Placement courses engage students in advanced-level course work. Students may elect to take AP World History, AP US History, AP Human Geography, AP Government and Politics, and AP Psychology. These classes build upon the skills presented in earlier courses and add to the levels of discourse, reading and writing.
World Language	The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners and to support the use of the target language. Instructional methods include whole-and small-group -instruction, modeling of strategies and oral and written use of the target language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to research the culture and history of the countries associated with the target language and to practice speaking and listening skills using Audacity, a multi-track audio editor and recorder.

English Language Learners	The curriculum is delivered using varied and differentiated strategies to meet the needs of all learners as they develop English fluency. Instructional methods include whole-and small-group -instruction, modeling of and oral and written use of the English language, whole- and small-group discussion, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills While this is the goal in all classes in the ELL department, limited classroom space often impacts the ability two fully implement these strategies/activities on a more frequent basis. EL Students access the curriculum in content area classes taught by teachers Sheltered English Immersion certification who use a range of strategies to support EL students in content area classes .Students also participate in Language and/or Literature Labs A, B, C, or D taught by certified EL teachers who employ instructional strategies to support and increase student abilities in the four domains: speaking, listening, reading, and writing.

Special Education	Special Education students are engaged core academic curriculum and are assigned a faculty advocate and scheduled into the appropriate classes as indicated in their IEP. The curriculum is delivered using varied, individualized and differentiated strategies to meet the needs of all learners. Instructional methods include whole-and small-group -instruction, modeling of strategies, use of both oral and written use of language, use of manipulatives and other hands-on learning tools, whole- and small-group discussion such as modeling read-aloud and think-aloud skills, collaborative activities, project-based exploration of topics, and the integration of technology using the distributive technology to engage in critical reading and multi-draft writing and editing activities to improve communication skills. Inclusion students receive support from a certified Inclusion teacher in their general education classes. Study Skills class supports students in the use of individualized and differentiated strategies to support their ability to access content area curriculum. Students in the STEP classes engage in small group and individualized instruction using a variety of individualized and differentiated strategies in accordance with their IEPs. Technology is integrated into lessons and classroom activities are guided by the district's High-Quality Reading Writing, and Discourse document. Resource classrooms use individualized and differentiated strategies along with scaffolded instruction to support students' ability to access the curriculum that meets their needs as identified in their IEP. Life Skills students work with dedicated and certified Life Skills teachers practicing the four domains of language acquisition: speaking, listening, reading and writing as well as in problem solving and numerical skills.

Coordinated Program Review

The last Coordinated Program Review for the Worcester Public School was on September 9, 2016, September 28, 2016 and October 21, 2016 (see Appendix E).

Core Academic Educational Activities/Outdoor Connections

Doherty Memorial High School utilizes all of its space, both inside the building and outside the building to support learning opportunities for all students. Some of the student-centered clubs and activities utilize outdoor space throughout the year to engage students and help them to form life-long connections with outdoor activities and interactions with nature. Doherty's Outdoor Club engages students in a variety of activities such as hiking, camping, and snowshoeing. The Envirothon Team is a hands-on environmental problem-solving competition for high school-aged students. Students in this group complete training and testing in five natural resource categories: i.e., soils/land use, aquatic ecology, forestry, wildlife, and current environmental issues. Students are involved in our school/community garden. In past years, vegetables grown in the garden have been shared with community members and with our own food service program.

The vision for the new school is to increase the use of outside space to support both curricular and extracurricular activities. During the visioning sessions involving members of the school and community, several members discussed the importance of students having access to outdoor spaces, including the opportunity to engage in classwork or learning activities outside. This could include having the science classes come out to the field to measure biodiversity, art students finding inspiration or capturing scenes from the community, theatrical productions or open-air stages affording differing venues for productions, and provide opportunities for other classes, groups, clubs, athletic teams, and community organizations to occupy this versatile space. Currently, we have a very active outdoor club and our Envirothon team is award winning and would benefit from and help to maintain this space along with those students who are active in community service.

Students in the Life Skills class will have access to outdoor space through a grade level entry. This will prove access to the garden which can be used as a teaching tool to support skills learned through the ADL Center. Other classes, such as science classes can also benefit from access to the garden as will classes in the Visual Arts department.

To support this need, the design of the new Doherty Memorial High School will include an exterior amphitheater style space, including a flat stage or production area. This exterior space will be supported by audio/visual technologies, including a large exterior projection screen, and the capacity to connect with microphones/speakers. A mobile projection cart can be brought to the space to support the needs of these varied organizations. The use of this projector/outdoor screen would be incorporated into all types of educational programming including core academic learning activities, student performances, and project presentations such as the ETA Learning Fairs, athletics, community building activities, and community use. Outdoor space with tables and seating would allow classes and clubs to access the grounds and to meet outside.

LPA Response: Opportunities to integrate an outdoor amphitheater/classroom will be reviewed in Schematic Design.

A Typical Day in the Life of a Student

Table 11

Activity or Subject	**Program Details and Educational Benefit*** Refer to descriptions of core academic educational activities
Free Breakfast	All students are eligible to participate in the breakfast program at school at no cost to the students or their families.
Period 1	Core Academic or Elective Class
Period 2	Core Academic or Elective Class
Period 3	Core Academic or Elective Class
Period 4	Core Academic or Elective Class
Lunch	All students are eligible to participate in the lunch program at school at no cost to the students or their families.
Period 5	Core Academic or Elective Class
Period 6	Core Academic or Elective Class
Period 7	Core Academic or Elective Class
After-School	Students may participate in extra help /tutoring sessions, clubs, activities and/ or sports

Clubs and Activities

Doherty Memorial High School offers a range of clubs and activities to support student interests. Clubs are student-driven and are supported by volunteer faculty advisors. Clubs meet after school in different areas of the school. Depending upon the specific activity.

The vision for the new school includes space for student clubs to meet after-school in safe, supervised areas of the building. Since most of these activities occur after the school day

designated meeting areas which would allow for supervision, access to restrooms, phones and technology would benefit these activities and help to support student involvement in their school. Students should be able to exit the building easily after participation in a club without having to walk through the entire building to reach the exit.

Some clubs and activities occur later in the day or early evening at the school indicating a need for meeting space close to the main entrance of the building. Storage space for club materials would benefit the groups as would a dedicated area to promote/advertise upcoming meetings and events. A calendar board or interactive screens dedicated to clubs and activities displayed in prominent spaces throughout the building (main foyer, cafeteria, media center, gym, and academic neighborhoods/academies).

Some of the student-centered clubs have included the outdoor club and the community garden. Outdoor space with tables and seating would allow clubs to access the grounds and to meet outside.

Clubs and Activities

Table 12

Anime Club	Highlanders Who Code	Stand for the Silent
Book Club	Humanities Scholars Collaborative	Student Council
Chorus*	Jazz Band*	Student Wellness Club
Class Officers	Madrigals*	Student Workroom
College Success Institute	Math Team	Superintendent's Student Advisory
Community Service	Meditation Club	Theater Club
Cultural Dance	Mock Trial Team	UNICEF Club
DTV*	Model UN	United Nations Club
Envirothon	Musical	Vex Robotics
First Knights Chess Club	National Honor Society	Weightlifting Club

Food Drive	Outdoor Club	Yearbook*
Gamers Club	PEACH Club	Yoga Club
Gay/Straight Alliance	Peer Tutors	Zumba Club
Girls Inc. Leadership Academy	Ski/Snowboard Club	*taken as a class

LPA|A Response: The organization of the building locates many spaces strategically for to after-hours use by clubs. Some of these include the Media Center, the Black Box Theater, the Large Group Seminar Room and the Cafeteria.

A Typical Week in the Life of a Student

Doherty Memorial High School operates on a seven-period day schedule with no variations. Every class meets every day.

Advanced Placement Course Enrollment Doherty Memorial High School

Table 13

	2015	2016	2017	2018	2019	2020 (Approximate)
Total # AP Students	299	286	337	432	468	unknown
Number of Exams Administered	554	482	561	722	805	741
Number of Courses Offered	18	18	20	20	20	22

Table 14

Student Enrollment Per AP Course						
	2015	2016	2017	2018	2019	2020
Art History (District-Wide)	1	2	5	2	3	1
Biology	82	52	70	105	74	47
Calculus AB	19	25	27	25	21	13
Calculus BC	14	12	10	27	31	24
Chemistry	17	22	17	32	Course not offered	8
Chinese	Course not offered	Course not offered	2	Course not offered	Course not offered	Course not offered
Computer Science A	2	4	9	6	Course not offered	5
Computer Science Principles					70	76

English Language and Composition	66	65	44	76	45	75
English Literature and Composition	64	60	23	40	32	33
Environmental Science	50	14	16	14	54	102
Human Geography	Course not offered	Course not offered	44	83	98	71
Physics 1	37	16	40	45	74	46
Physics 2	37	16	39	45	74	Course not offered
Psychology	55	61	50	57	67	61
Research	Course not offered	Course not offered	Course not offered	Course not offered	14	1
Seminar	Course not offered	Course not offered	Course not offered	22	16	6
Spanish Language and Culture	18	16	14	12	16	18
Statistics	25	53	33	31	29	38
Studio Art: Drawing Portfolio	15	10	20	19	20	25

United States Government and Politics	18	12	19	26	23	16
United States History	23	26	66	42	43	23
World History	11	15	11	13	12	13
Economics	Course not offered	Course not offered	Course not offered	Course not offered	Course not offered	49

N. Transportation Policies

The Worcester Public Schools offers transportation (bus) services to eligible students. Based on geographical and population distributions, Worcester is broken into quadrants. Students, based on their address, are assigned to a comprehensive 'home' school. Students who live 2.0 or more miles away from their assigned home school are provided, without a fee, bus services. Students under the 2.0-mile limit are responsible for getting to and from school.

Students seeking to attend a comprehensive school other than their home school are able to apply for special permission. If granted this permission, students are required to provide their own transportation, even if their address is more than 2.0 miles from the school.

All students with a driver's license are currently able to receive a parking sticker, without a fee, and park on campus. All parking lots are at, or over, capacity and therefore are available on a first-come, first-served policy. The number of students requesting parking stickers is steadily increasing, and in the near future the school administration will likely consider identifying and implementing selection criteria to better manage the limited parking spaces.

Doherty currently has one vocational program, and all eighth-grade students across all Worcester districts are eligible to apply for admission to this program. With the MSBA proposal, Doherty is working to add three additional trade programs. If successful, all Worcester students will again be eligible to apply for admission. Any student enrolled in a vocational program is provided bus transportation for as long as they remain in the program, and as long as they live 2.0 or more miles from the school. This policy extends to students from across the district.

With our current academic programming, including one vocational program serving students from across the district, and based on fairly steady population density and housing rates, the school has required nine large buses and five small buses to service the transportation needs of the students. This has remained steady for the past three years, and increased from eight and four respectively. These figures will certainly increase as new vocational programs, as well as the advanced academy, become available. Similarly, the location of a potential new school would have ramifications for the transportation needs of the students.

Per their IEP or 504 plan, eligible students are also provided transportation services. Based on the individual needs and circumstances, these students are provided door-to-door transportation via small bus routes.

In total, 681 students were provided transportation services during the 2018-2019 school year.

At this time, there are no planned changes to the Worcester Public Schools' transportation policies. However, the school's final location and educational programming decisions may/will impact the transportation needs of the students in attendance.

LPA|A Response: The preferred solution site plan provides separate bus and parent pickup/drop off loops as well as the required number of parking spaces defined in the Site Development Requirements.

O. Functional/Spatial Relationships

There are several functional and spatial relationships and adjacencies that we envision as important to the design and program development for the new/renovated Doherty Memorial High School. We have highlighted some of the priority areas below.

- The ninth-grade academies to be located adjacent to one another in a "neighborhood" in order to provide the necessary additional support to these students as they transition to high school. Each academy and team of teachers associated with the academy will have a common space to support increased collaboration, project-based learning, and interactive learning experiences.

- The Medical Suite to be located near the Principal's office in order to be able to support the nurses when needed.

- The English Language Arts and Social Studies department areas, serving students in grades 10-12, to be adjacent and share a common area, “neighborhood”, in order to foster interdisciplinary connections in the humanities.

- The Mathematics and Science, Technology and Engineering department areas serving students in grades 10-12, to be adjacent and share a common area, “neighborhood”, in order to foster interdisciplinary connections in STEM/STEAM.

- The Performing and Visual Art areas, “neighborhood”, to be close in proximity to support the comprehensive Art program and to foster collaboration and be equally accessible to all students and staff.

- The gymnasium, the auditorium, and the cafeteria to be used not only by all students and staff, but also to be a community space for use after school hours that can be secured from the academic areas of the building.

- Special education classrooms/learning centers to be distributed and integrated throughout our fully handicapped accessible, ADA compliant, new/renovated facility.

- The Media Center, with the desired Maker Space, to be centrally located ensuring equitable access to all students and staff.

LPA|A Response: Each of these required adjacencies is addressed within the Preferred Solution, and will be developed further in Schematic Design. Refer to the updated Adjacency Diagrams in section 3.3.4.A.4.

Building Systems

The design and construction of the new Doherty Memorial High School will include and reflect modern technologies, energy efficiencies, sustainable practices, and supportive infrastructure.

The mechanical system design for the school will reflect the needs identified above. The facility will be fully air-conditioned. Using gas as a primary energy source, the school will be supported by high-efficiency Lochinvar gas boilers. The boiler will be centrally located and include overhead, garage door style access. The school will include full mechanical system controls with easy to access systems. The roof will be accessible through a walkout access door, not a ladder.

The school’s plumbing needs will reflect current best practices. Students, staff and visitors will have access to gender neutral bathrooms utilizing low water urinals. The kitchen will have grease

traps with easy cleanout capacity, and the facility will have oil separator traps with easy cleanout access.

Students, staff and visitors will have access to restroom facilities. Throughout the building and into key community spaces, the design will include numerous gender-neutral restroom facilities to support the needs of all in the building, as well as sets of male/female restrooms. In key spaces, the facility will provide personal shower capacity.

Doherty Memorial High School, seeking to implement sustainable and environmentally friendly practices, will install water stations throughout the building. These will allow for direct water access as well as a faucet for students, staff, and visitors to refill water bottles as needed.

To support an efficient facility, the electrical system will incorporate smart technologies and energy efficient options. The school will have fully controllable LED lighting. Staff will be able to raise and lower the auditorium lighting, e.g. light bars, thereby removing the need for a lift to replace bulbs. A generator providing back-up power will be stored on site.

LPA|A Response: Area for building systems is included in the Space Summary's 1.5 grossing factor. Specific areas and spaces will be defined in the Schematic Design phase. Refer to the Basis of Design Narratives in section 3.3.3.D.1.

P. Security and Visual Access

Security and visual access requirements are currently implemented at Doherty Memorial High School. There are approximately 55 working cameras that are strategically placed throughout the school building, an increase from 20 cameras from the 2017-2018 school year. The cameras are located in hallways, the cafeteria, several sections around the parking lot, and several of the school's many entrance/exit doorways. The cameras are monitored in two administrative offices. There is a camera and electronic unlocking system, which includes a microphone and speaker feature, at the main entry door to the building. The main office staff has access to this camera and can provide access to visitors and students. Despite the number of functional cameras, there are numerous sections of the building for which there is no security coverage. The current layout of the building includes many 90-degree turns and mid-corridor doorways that limit visual access.

The WPS has standardized district-wide on the use of Genetec for video surveillance as well as AXIS brand surveillance cameras. The district will provide proprietary specifications information for these products in the Schematic Design submission. This standardization allows

the WPS to reduce on-going training for staff and lower maintenance costs and maintenance timeframes for hardware.

The design for the new building includes plans that all interior circulation and major spaces will have camera surveillance, as well as the outside perimeter around the school and in the parking lot, thereby providing full saturation of the campus. With the increased size of the new building, its expected student and staff utilization during non-school hours, and its increased public access and use, there will be the need for thorough state-of-the-art camera and security systems to cover all areas of the building and campus. Video surveillance cameras will be a combination of fixed view, panoramic and pan-tilt-zoom (PTZ). Camera location and required view will dictate the camera type. A conduit to be provided for cameras around athletic fields and locations not directly attached to the main structure such as parking garage/overhang.

The physical layout of the building design should eliminate blind spots under stairwells, so a dedicated camera is not required. Infrastructure for cameras at all locations should be provided, even if the funding is not in place immediately. Monitoring stations will be provided for the main office, SRO office, principal office and assistant principal offices.

The main office and principal's office will have a large format display connected to the surveillance system for monitoring of multiple camera feeds at once. Remote access to the camera feeds may be granted via the main Genetec system. The intent is to provide login access for Police Department to access the security system, per the existing Memorandum of Understanding (MOU). Data storage will be required for all camera footage capable of storing a minimum of 33 days of video. Server hardware will be required to process the archiving of all camera footage to data storage.

The access point to the school will be separated by an entrance corridor to the main office and will be monitored and controlled by personnel in the main office. This main building entrance will be adjacent to the main office and within a line of sight to the office. Access through these doors will be controlled via a video intercom/intelligent door controller connected to the district's main access control system and will be controlled via main office staff. Entry will be allowed to the school through exterior and interior vestibule doors at the start of the school day. After the start of school, the interior vestibule doors will be locked.

A door from the vestibule will provide direct access to the main office through the use of a video intercom and an intelligent door control unit that is tied into the district's main access control system and is controlled by the main office staff. All visitors, during and after school, must go through the main office to access the school. After school, access to the building will also be through the main office.

All exterior doors, along with portions of Information Technology spaces, will utilize an electronic card access. The IT spaces housing the Main and Intermediate Distribution Frames (MDF and IDF respectively), the storage space, as well as the Support Specialist Office/Meeting spaces will be accessible via an electronic card access.

Across the district, the Worcester Public Schools is standardizing on the utilization of access cards, as opposed to key fobs, to leverage existing ID and timecard printing standards being used district-wide. If a card is lost the access rights to that card can be terminated. All exterior entrances will have a card reader to allow and log access. Critical facility locations (such as data closets and server room) will have a card reader to allow and log access. An added benefit to the ID access card protocol is that card reader access will be controlled centrally based on schedule or cardholder permissions.

Effective P.A. and phone communication systems is vital between all classes, laboratories, shops, and community spaces. This will be accomplished with a telephone/intercom system that allows direct calls to be made from one school space to another. In addition, the laboratory/shop spaces will include a visual cue when an incoming call is made. Often the noise levels in these spaces can prevent the staff member from hearing the intercom or call: a visual, such as a flashing light, in addition to the ring will ensure that all rooms can be contacted.

All classrooms and general spaces will include digital clock displays. These will have the capability of broadcasting messages, for example an emergency notification, when needed.

All communications (including bell system which is tied into phone) will be on emergency power generators. All phones in classrooms will have capabilities (with access code) to call out and to page. The Worcester Public Schools' standard is the Shoretel/Mitel voice-over-ip phone system and phones. The district will provide proprietary specifications information for these products in the Schematic Design submission. In addition, each classroom to have two emergency call switches, which opens a direct speaker from classroom to office.

Per existing code, a repeater system/signal booster will be provided for police and fire communications. Both Worcester Police and Fire Departments are recommended to use the same frequency for this DAS "repeater" system.

The design of the new school allows for vehicular access around the full perimeter of the building. Bollards, planters or a more welcoming design feature that provides similar security protections are desired at the front entry. To discourage after-hours access to the athletic fields by vehicles, the design calls for the potential use of bollards, gates or similar features will be used as deterrents.

The Worcester Fire department prefers that no key is required to access the grounds.

Appropriate representatives from various first responding emergency agencies, e.g. Worcester Fire, Worcester Police, and Worcester Emergency Management personnel, will be consulted in the planning process and associated requirements will be incorporated into the preferred solution.

Principals update and review the emergency response plan every year and train all faculty members. A minimum of two times a year, Doherty Memorial High School faculty and students participate in a mock light lock down and a full lock down. All district schools have adopted and implement the ALICE Model (Alert, Lockdown, Inform, Counter, and Evacuate) when responding to a crisis. Additionally, all administrators have In Force 911 installed on their cell phones which provides a means to contact all emergency personnel in the city within seconds should an emergency situation warranting that action were to occur. Principals and the school-based emergency team lead the faculty in practicing a medical emergency drill. Doherty High participated in their last Medical Emergency Drill on August 26, 2019.

Beginning in the 2015-16 school year, a School Resource Officer (SRO) was assigned to the building to support a safe and secure school environment. Doherty Memorial High School has one School Resource Officer (SRO) who is employed by the Worcester Police Department, as a police officer and is trained in the national SRO model of teacher/mentor/law enforcement triangle. The SRO requires a private office within the school to conduct mediations or meetings with parents, the SRO may also use a conference room when necessary. The goal of the SRO is to establish positive relationships with students and faculty, to monitor and deter altercations in the cafeteria and hallways, and as a last resort to engage in an incident. The SRO works closely with school administrators and utilizes a community policing method to build positive relationships with students. However, the staff and teachers at Doherty High have the primary responsibility to intervene during in-school disputes.

The SRO currently has an office near the first-floor assistant principals' offices.

Our vision for the new school is to place the SRO’s office on the first floor adjacent to the principal’s office. The office needs to provide space for the officer to meet in private, with administrators, students, and families. The office will need access to technology as well as a separate and secure phone line.

LPA|A Response: An office for the SRO is located within the Main Administration office, and a security office is located within the Main Entrance lobby. Additional discussions on security with City and School stakeholders will take place in future design phases.

Audio/Visual

Doherty currently has a variety of audio/visual and projection equipment throughout the building. Over the years, several classroom spaces have been outfitted with wall or ceiling mounted projectors. The school has acquired approximately 24 carts outfitted with a projector and a document camera. These carts are shared between all staff throughout each day.

The communal spaces, including the library, cafeteria, auditorium, and gymnasium have no wired infrastructure to support audio capabilities, such as speakers or microphones. Instead, the school has a portable unit that is brought to the location. Power, microphone and speaker cords are run along the floor and/or wall and typically are taped down or covered with a carpet swatch for safety purposes. The speakers and amplifier set-up are not fully compatible with the physical layout of the varied spaces; therefore, the audio technology's efficacy is limited.

The goal within a new facility is to provide effective, up-to-date technological access for all stakeholders - students, staff, district personnel, and community members - within all rooms and spaces in the school. Classroom spaces would include Epson bright link short-throw projectors, document cameras wired for use, Chromecast/Apple TV capacity, speech reinforcement technologies, and flat-screen televisions or monitors available for varied (independent or mirrored) displays in and around classrooms. Communal spaces, including the cafeteria, auditorium, library, common or meeting rooms, would have similar projection capacity, and the larger presentation spaces will provide audio technologies, including speakers, podiums, microphones, etc.

Like any facility utilizing technology, the school will require space to store equipment along with a space to maintain or repair damaged devices. The proposed design includes an Information Technology Office serving many purposes: students will learn alongside district IT personnel as the professionals service the school network; the IT professionals have a dedicated workspace that enables collaboration; a computer network storage room; as well as a storage and maintenance space. The proposal is to utilize the IT storage and maintenance space in a dual capacity - serving the IT as well as the audio/visual needs of the school.

LPA|A Response: Specific technology requirements will be addressed in greater detail in the Schematic Design phase. Refer to the Electrical Basis of Design Narrative in section 3.3.3.D.1.

Conclusion

It is our hope that throughout this document we have been able to capture and communicate to you, the commitment, collaboration, community, culture and climate of our school and that you will support our desire to establish a new and more suitable home for the Doherty family and for our surrounding community. We are grateful to the MSBA to have been given this opportunity. As Jim Rohn states, "Whatever good things we build end up building us" and it is our hope that the new building will support the programs we will offer and help us to prepare our students to be capable and contributing members of our community, both locally and globally.

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APPENDIX

Appendix A: Refer to Section 3.1.2.D.4

Appendix B

Early College High School Program **Quick Reference Information Sheet**

Program Description

The Early College program is a secondary/post-secondary partnership involving Worcester State University, Quinsigamond Community College and Worcester Public Schools.

This collaborative program enables high school students to participate in college/career readiness activities, in addition to taking academic and career credit course offerings at their high school or one of the college campuses. Students earn at least 3 college and high school credits simultaneously and graduate from high school with a high school diploma with up to 12 college credits.

The goal of the program is not only to increase the percentage of college ready high school graduates, but also to provide students with a "head start" on earning a two to four year college degree. The collaborative program ensures that students receive support in both academics and advising in addition to wraparound services to promote success and completion. Family engagement activities will also be a component of the Early College Program.

Program Requirements

High School students follow the traditional 9th and 10th grade course schedule and begin to explore career pathways by participating in the following:

- Introduction to College and Career Readiness Course (9th grade)
- College and Career Readiness I Course (10th grade)

Beginning in the 11th grade, students choose a pathway. In addition, students participate in the following:

- College and Career Readiness II Course
- 1-2 college courses at their high school or on one of the college campuses

In 12th grade students fulfill high school requirements through the completion of both high school and college courses. Upon graduation students transfer 12 college credits to their college of choice and continue their study to complete an associate or bachelor's degree program.

Program Participation/Commitment

Program participation is open to any student enrolled in a WPS high school. Students commit to complete a minimum of 12 college credits prior to completing high school.

Pathway Offerings

- Healthcare – Nurse Education
- Advanced Manufacturing
- Computer & Information Technology
- Engineering & Biotechnology
- Elementary Education Transfer Option
- Hospitality and Recreation Management
- 100 Males to College
- General Studies

Program Capacity

Year 1 – 120 students participate in dual enrollment
Year 2 – 240 students participate in dual enrollment
Year 3 – 300 students participate in dual enrollment

Application Process

Students complete an Early College Program application in their 9th grade. If the number of applicants exceeds the number of seats available, selection will be made by lottery.

Worcester Public Schools
October 5, 2018

Appendix C

Worcester Public Schools **Innovation Pathways Quick Reference Sheet**

Empowering students with a career vision and the skills to pursue it with confidence

Program Description

The Innovation Pathways Program was developed to help expand career field exploration through technical education within the Worcester Public Schools. Students participating in the program will experience an in-depth look at a career field of their interest; work towards industry recognized credentials in that area; engage in college and career planning activities; and gain experience through a summer internship or a capstone project. Worcester Public Schools has worked with many organizations and businesses to develop a program that meets the needs and interests of students as well as future labor market demands. We are proud partners with:

- MassHire Central Region Workforce Board
- One8 Foundation
- Worcester Regional Chamber of Commerce and Business Partners

Program Requirements

- College and Career Readiness I and II – classes taken at home high school
  - provides student support, college and career planning, industry connections, technology knowledge and skills, management and entrepreneurship, employability skills, and financial skills
- 2 Technical Classes from Program List below
  - November 5 through Mid-March
  - 2-3 days a week (depending on program) from 2:30 – 5:30 at Worcester Technical HS
  - Bussing to WTHS provided. WRTA passes or guardian pickup for trip home
  - Snow days are made up the week following the missed class
  - Students receive WPS credit on their transcript for the classes
- 100-hour Paid Internship or Capstone
  - After successful completion of both technical courses
  - Internships will be targeted for summer months based on industry availability
  - Students receive WPS credit on their transcript
- 2 Courses that qualify as College Level
  - AP or Dual Enrollment classes

Program Participation/Commitment

Program participation is open to any student enrolled in a WPS comprehensive high school. Preference will be given to 9th graders during the application period. After acceptance, students will complete one technical class each of the following two years and then a summer internship or capstone.

Created: October 5, 2018 **Page 1 of 2**

Appendix D Family and Community Guide

https://worcesterschools.org/wp-content/uploads/2018/07/wps_family-guide-and-community_resources.pdf

Appendix E Coordinated Program Review

Quinn, Eileen

From: Szymczak, Jayme <jszymczak@doe.mass.edu>
Sent: Wednesday, November 02, 2016 2:50 PM
To: Binienda, Maureen
Cc: Seale, Kay C.; Quinn, Eileen; Rodrigues, Marco; Paulin, Amy (DOE); PQA-CAP
Subject: Subject: Department of Elementary and Secondary Education Review of Worcester Public School District's Coordinated Program Review Corrective Action Plan Civil Rights Progress Reports

Importance: High

Dear Superintendent Binienda:

Thank you for your district's recently submitted Coordinated Program Review Corrective Action Plan special education progress reports, which the Department has now reviewed.

After reviewing your progress reports, we are pleased to inform you that no further progress reports are now required. **You can access the Department's review and the Progress Report forms directly by going into WBMS and clicking on the area on the menu bar entitled "CAP/Progress Reports."**

Please contact Jayme Szymczak at 781-338-3738 if further clarification is needed on any matters presented here.

Sincerely,

Jayme Szymczak, Follow-up Liaison
Office of Public School Monitoring
Massachusetts Department of Elementary and Secondary Education
75 Pleasant Street
Malden, MA 02148
jszymczak@doe.mass.edu

Amy Paulin, Supervisor
Office of Public School Monitoring
Massachusetts Department of Elementary and Secondary Education
75 Pleasant Street
Malden, MA 02148
apaulin@doe.mass.edu

Additionally, Refer to section 3.1.2.D.9 & 10

Appendix F: Refer to 3.1.2.C Chapter 74 Program

Chapter 74 Programming Submission

Appendix G: Refer to 3.1.2.D.11

STEM Learning Design, LLC. (2018). Review and Recommendations of Best Practices for K-12 STEM Learning Spaces. Retrieved from https://stemlearningdesign.com/resources/

Massachusetts Department of Elementary and Secondary Education

75 Pleasant Street, Malden, Massachusetts 02148-4906

Telephone: (781) 338-3000
TTY: N.E.T. Relay 1-800-439-2370

Jeffrey C. Riley
Commissioner

October 7, 2019

Mary Pichetti
Director of Capital Planning
Massachusetts School Building Authority
40 Broad Street, Suite 500
Boston, MA 02109

Dear Ms. Pichetti:

The Worcester Public Schools have notified the Department of Elementary and Secondary Education ("DESE") of their intent to offer Chapter 74 Career/Vocational Technical Education (CTE) programs as part of a new facility at Doherty Memorial High School, which is the subject of a feasibility study being conducted in collaboration with the Massachusetts School Building Authority as part of its school construction grant program.

DESE staff members have reviewed the District's Chapter 74 Programming Submission received via the Massachusetts School Building Authority. The information included plans for continuing and expanding existing programs, as well as for adding new programs.

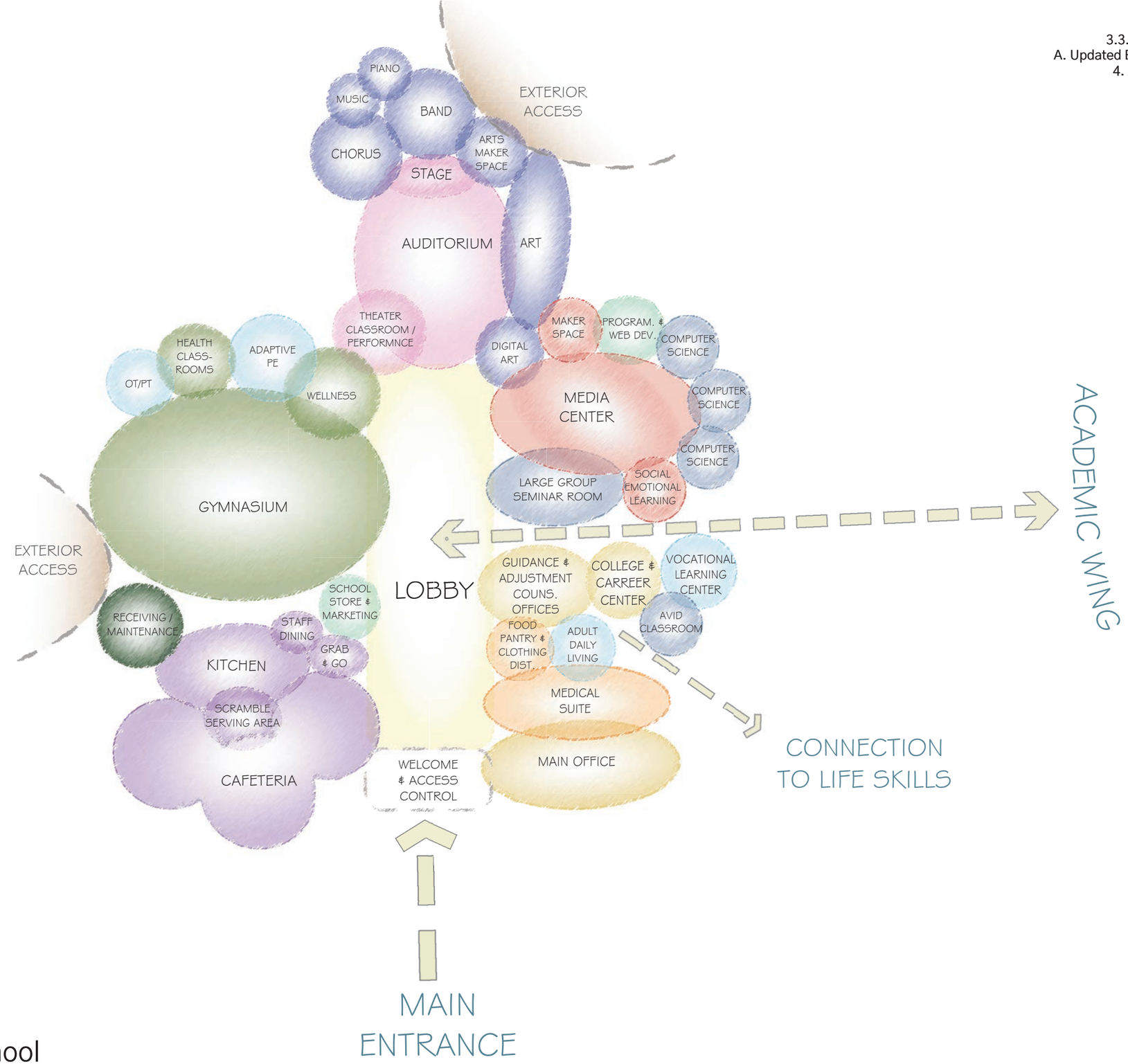
Chapter 74 Program Offerings	Comments
Engineering	Expansion of existing program
Computer Programming and Web Development	New program
Construction Craft Laborer	New program
Marketing	New program

Note that the purpose of this letter is not to grant formal or final approval for these Chapter 74 programs, but to certify that the district has consulted with local stakeholders and analyzed labor market information during the initial planning stages of the new school building, and that DESE is in general agreement with their proposal going into the next phases of the project.

Sincerely,

Cliff Chuang
Senior Associate Commissioner, Educational Options, DESE

Cc: Jeff Wulfson, Deputy Commissioner, DESE
Judith Klimkiewicz, Management Consultant for Strategic Planning for CCTE, DESE
Marnie Jain, CCTE, DESE
Larry DeSalvatore, CCTE, DESE
Lisa Sandler, CCTE, DESE
John Jumpe, Director of Project Management, MSBA
Diane Sullivan, Director of Program Management. MSBA
Katie DeCristofaro, Capital Program Manager, MSBA
Katie Loeffler, Capital Program Manager, MSBA
Rebecca Whidden, Project Manager, MSBA
Jess Deleconio, Project Manager, MSBA
Allison Jones, Senior Project Coordinator, MSBA
Matthew Deninger, DESE Commissioner's Designee, MSBA Board of Directors


PIANO
MUSIC
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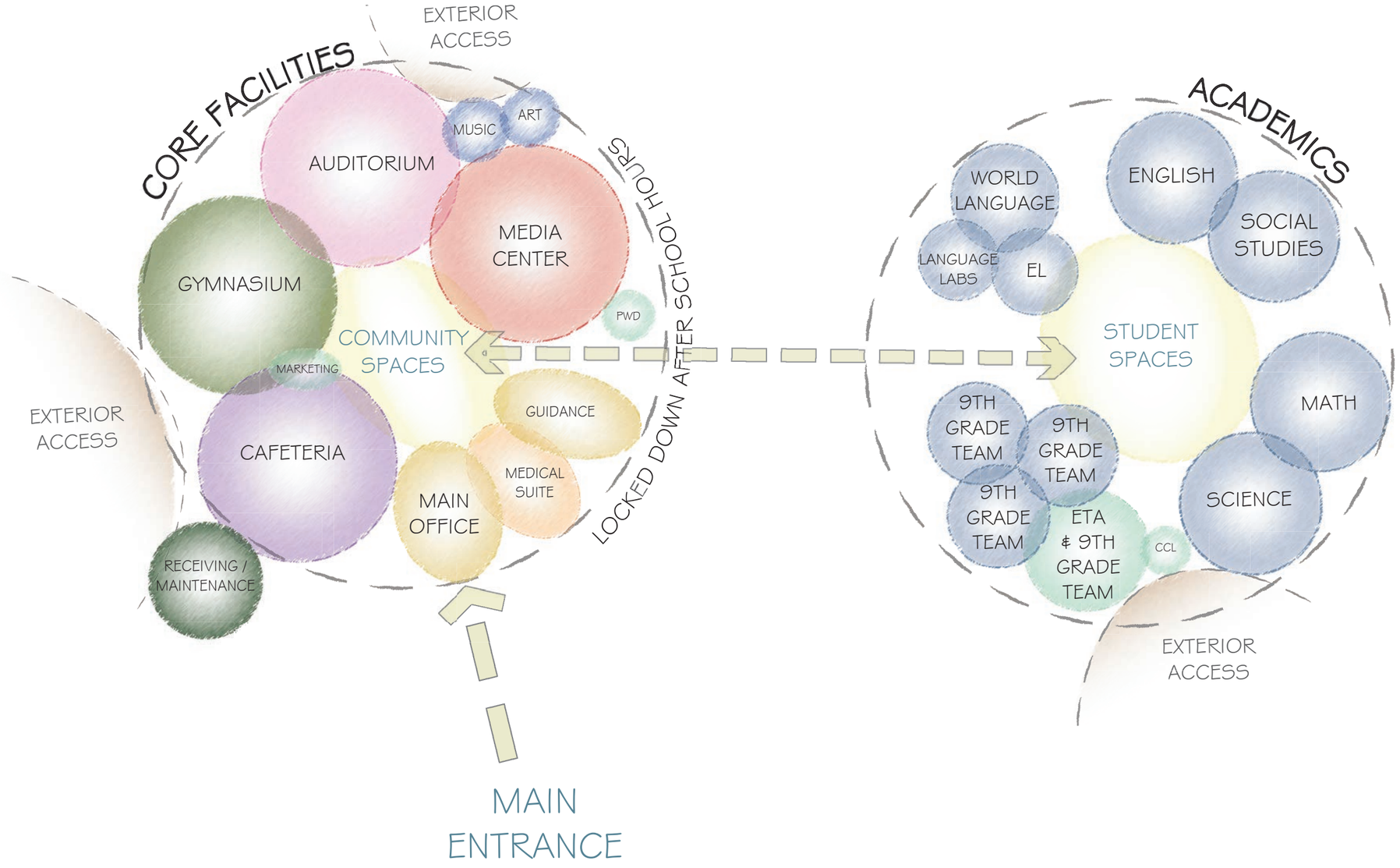
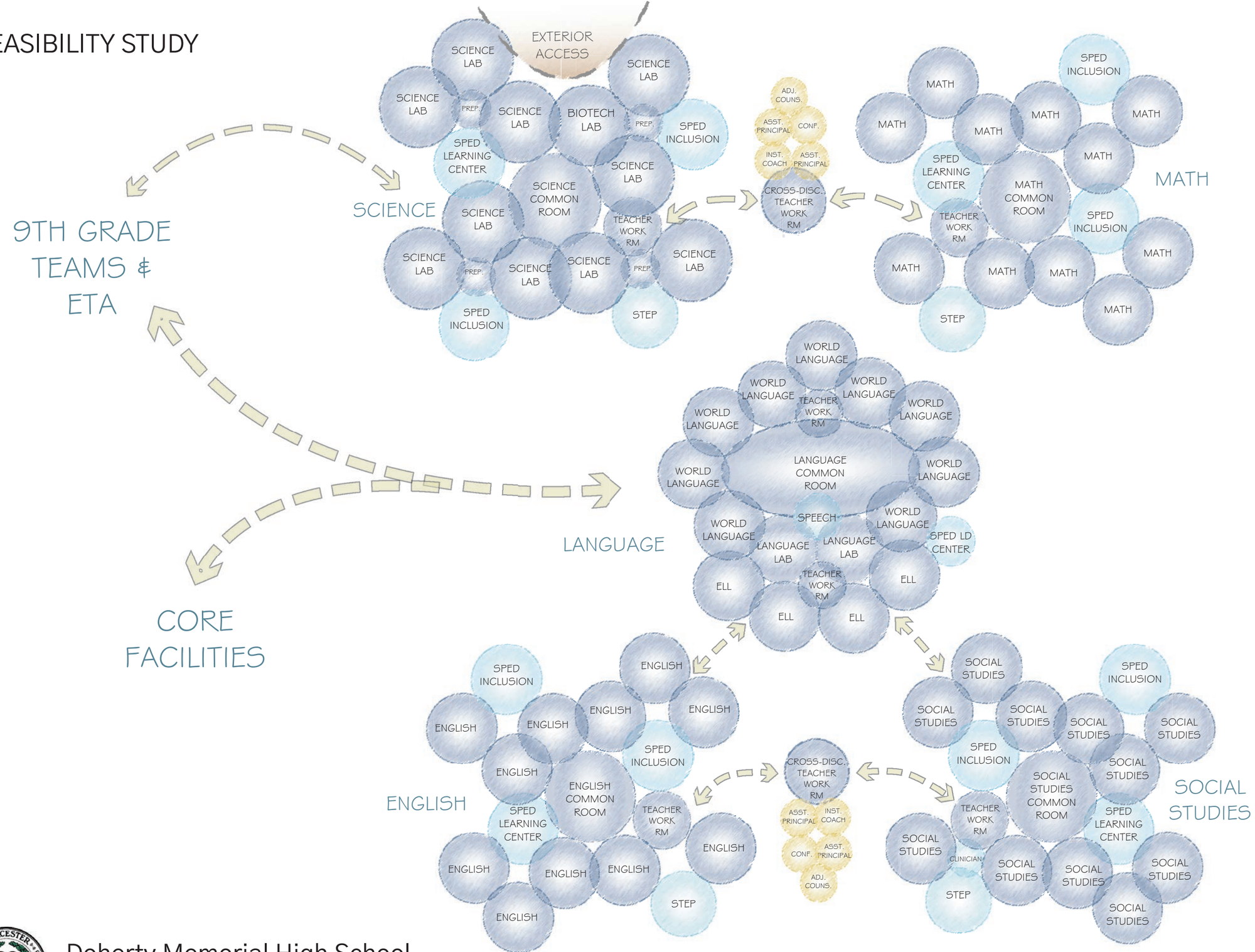
ARTS MAKER SPACE
STAGE
EXTERIOR ACCESS
AUDITORIUM
ART
THEATER CLASSROOM / PERFORMNCE
HEALTH CLASS-ROOMS
ADAPTIVE PE
OT/PT
WELLNESS
MAKER SPACE
PROGRAM. & WEB DEV.
COMPUTER SCIENCE
DIGITAL ART
MEDIA CENTER
COMPUTER SCIENCE
COMPUTER SCIENCE
LARGE GROUP SEMINAR ROOM
SOCIAL EMOTIONAL LEARNING
ACADEMIC WING
GYMNASIUM
EXTERIOR ACCESS
LOBBY
GUIDANCE & ADJUSTMENT COUNS. OFFICES
COLLEGE & CARREER CENTER
VOCATIONAL LEARNING CENTER
AVID CLASSROOM
FOOD PANTRY & CLOTHING DIST.
ADULT DAILY LIVING
SCHOOL STORE & MARKETING
RECEIVING / MAINTENANCE
STAFF DINING
GRAB & GO
KITCHEN
SCRAMBLE SERVING AREA
MEDICAL SUITE
MAIN OFFICE
CAFETERIA
WELCOME & ACCESS CONTROL
CONNECTION TO LIFE SKILLS
MAIN ENTRANCE


CORE FACILITIES
EXTERIOR ACCESS
AUDITORIUM
MUSIC
ART
MEDIA CENTER
GYMNASIUM
PWD
COMMUNITY SPACES
MARKETING
GUIDANCE
EXTERIOR ACCESS
CAFETERIA
MEDICAL SUITE
MAIN OFFICE
RECEIVING / MAINTENANCE
LOCKED DOWN AFTER SCHOOL HOURS
ACADEMICS
WORLD LANGUAGE
ENGLISH
SOCIAL STUDIES
LANGUAGE LABS
EL
STUDENT SPACES
MATH
9TH GRADE TEAM
9TH GRADE TEAM
SCIENCE
9TH GRADE TEAM
ETA & 9TH GRADE TEAM
CCL
EXTERIOR ACCESS
MAIN ENTRANCE


EXTERIOR ACCESS
9TH GRADE TEAMS & ETA
SCIENCE
SCIENCE LAB
PREP.
BIOTECH LAB
SPED INCLUSION
SPED LEARNING CENTER
SCIENCE COMMON ROOM
TEACHER WORK RM
STEP
ADJ. COUNS.
ASST. PRINCIPAL
CONF.
INST. COACH
CROSS-DISC. TEACHER WORK RM
MATH
MATH COMMON ROOM
CORE FACILITIES
LANGUAGE
WORLD LANGUAGE
LANGUAGE COMMON ROOM
SPEECH
LANGUAGE LAB
SPED LD CENTER
ELL
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SOCIAL STUDIES
SOCIAL STUDIES COMMON ROOM
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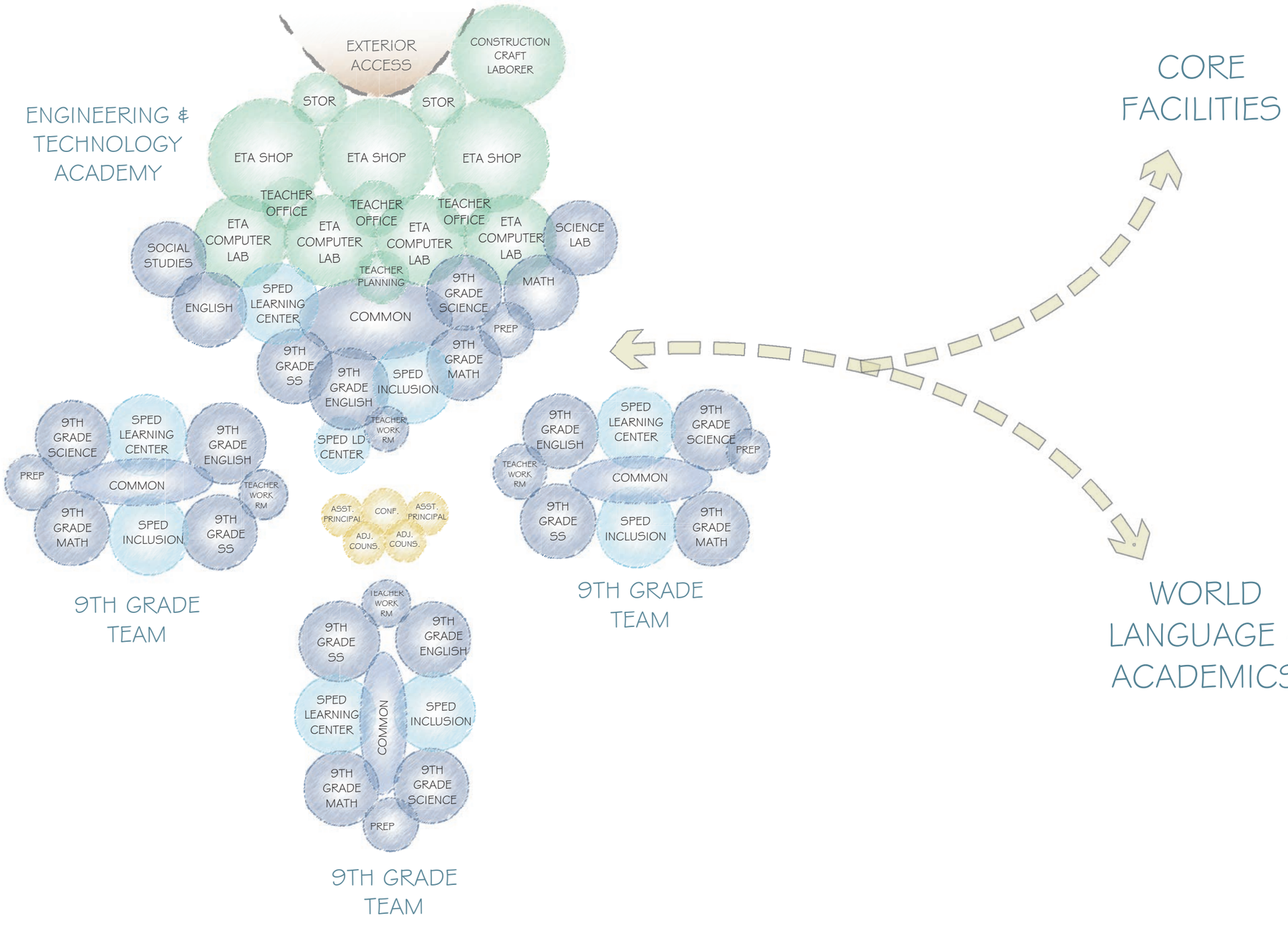
EXTERIOR ACCESS
CONSTRUCTION CRAFT LABORER
STOR
STOR
ENGINEERING & TECHNOLOGY ACADEMY
ETA SHOP
ETA SHOP
ETA SHOP
TEACHER OFFICE
TEACHER OFFICE
TEACHER OFFICE
ETA COMPUTER LAB
ETA COMPUTER LAB
ETA COMPUTER LAB
ETA COMPUTER LAB
SOCIAL STUDIES
SCIENCE LAB
TEACHER PLANNING
ENGLISH
SPED LEARNING CENTER
COMMON
9TH GRADE SCIENCE
MATH
PREP
9TH GRADE SS
9TH GRADE ENGLISH
SPED INCLUSION
9TH GRADE MATH
SPED LD CENTER
TEACHER WORK RM
CORE FACILITIES
9TH GRADE SCIENCE
SPED LEARNING CENTER
9TH GRADE ENGLISH
PREP
TEACHER WORK RM
COMMON
9TH GRADE MATH
SPED INCLUSION
9TH GRADE SS
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CONF.
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ADJ. COUNS.
ADJ. COUNS.
9TH GRADE TEAM
9TH GRADE TEAM
TEACHER WORK RM
9TH GRADE SS
9TH GRADE ENGLISH
SPED LEARNING CENTER
COMMON
SPED INCLUSION
9TH GRADE MATH
9TH GRADE SCIENCE
PREP
9TH GRADE TEAM
WORLD LANGUAGE & ACADEMICS

3.3.4 PREFERRED SOLUTION

B. Updated Space Summary

1. Space Summary Template *****
2. Space Summary Template Variation Narrative *****
3. Updated Existing vs. Proposed Diagram

*** Updated 02/18/2020**