



Chelmsford School Department School Committee

Notice of Public Meeting

Email Posting to townclerk@townofchelmsford.us Thank you.

Filed with Town Clerk:

As required by G.L. c. 30 A, §18-25

DATE: Tuesday December 15, 2020 TIME: 6:00 p.m. ROOM: Conf. Room 1

PLACE: CPS Central Administration Office ADDRESS: 230 North Road

The Chelmsford School Committee intends to conduct an in-person meeting on the date and time specified, however all public participation will take place remotely, not in-person. The meeting is not open to the public for in-person participation. The meeting will be live-streamed by Chelmsford Telemedia for interested community members to access and watch. Interested community members may e-mail Superintendent of Schools, Dr. Jay Lang, at langj@chelmsford.k12.ma.us prior to 5:00 p.m. on Tuesday December 15, 2020 to be recognized to provide remote public input under the public participation portion(s) of the agenda via a GoToMeeting link that will be provided.

CALL TO ORDER

PLEDGE OF ALLEGIANCE

CHAIR OPENING STATEMENT

CONSENT AGENDA

1. Approval of the minutes of the regular school committee meeting of December 1, 2020

CHS STUDENT REPRESENTATIVE ANNOUNCEMENTS

GOOD NEWS

PUBLIC COMMENTS:

The School Committee will hear from members of the public on items listed under New Business on the posted agenda.

NEW BUSINESS

1. Presentation: CHS Innovation Pathways Program
2. Presentation: Technology Update
3. Presentation: HVAC Assessment Report
4. Recommended FY2021 Budget Transfers

5. CHS Winter Sports Update
6. Vote to Accept Donation: Makerspace at Parker Middle School
7. 2021 MCAS Assessment and ACCESS Schedules Update
8. FY2022 Capital Plan Update
9. Tri-Board Budgetary Meeting: Monday January 11, 2021 at 7:00 p.m.
10. Personnel Report: November 2020
11. Valley Collaborative 2019/20 Annual Report
12. Valley Collaborative Fall 2020 Newsletter

REPORTS

1. Liaison Reports

ACTION/NEW ITEMS

1. Request for Reports & Updates

PUBLIC COMMENTS:

The School Committee will hear from members of the public on general matters of education interest.

EXECUTIVE SESSION:

M.G.L. Ch. 30A, Section 21(a)(3) - The Chelmsford School Committee provides public notice of its intent to convene in executive session to discuss strategy with respect to collective bargaining or litigation if an open meeting may have a detrimental effect on the bargaining or litigating position of the public body.

ADJOURNMENT

**CHELMSFORD SCHOOL COMMITTEE
REGULAR MEETING
December 1, 2020
Meeting Minutes**

Members Present: Mr. Dennis King (Chair), Ms. Donna Newcomb (Vice Chair), Mr. Jeff Doherty (Secretary), Mr. John Moses and Ms. Maria Santos.

Also present: Dr. Jay Lang (Superintendent), Dr. Linda Hirsch (Assistant Superintendent) and Ms. Joanna Johnson-Collins (Director of Business and Finance).

Call to Order

6:00 p.m.

Pledge of Allegiance

Chair Opening Statement

“Tonight’s meeting is being live-streamed by Chelmsford Telemedia and posted to the CPS website for interested community members to access and watch. Although we are not allowing for in-person public participation, interested community members are encouraged to submit their names and addresses to Superintendent Lang if they would like to participate remotely under the public input portion of our meeting. During our public input session anyone who has joined us through the *gotomeeting* platform and expressed interest in making a comment will be recognized by the Superintendent and allowed to speak with The Committee. If anyone watching this meeting live has questions or comments to share they are encouraged to email one of us during the meeting. We will read those questions or comments during our second public input session at the end of the meeting.”

The Chair welcomed all to the meeting.

Consent Agenda

1. **Approval of the minutes of the regular school committee meeting of November 17, 2020.**

Ms. Newcomb motioned for the school committee to accept the minutes of the regular school committee meeting of November 17, 2020. Mr. Moses seconded. Motion carries 5-0.

Good News

Dr. Hirsch shared that Katie Simes was able to secure 30 snowshoes and poles for the PE department at CHS. Additionally, she has applied for grants to obtain snowshoes and poles for both middle schools, so the students can enjoy outside fun this winter. Seventeen CHS students are moving forward to the All State Honors for music. They all received the highest possible scores for their instruments and voices!

Public Comments

None.

New Business

1. Update on CPS COVID-19 Health and Safety Protocol

Peggy Gump, Coordinator for School Nursing Services, joined the meeting remotely. Ms. Gump has been instrumental in collaborating between the Town's public health workers and the schools. New protocols were adapted by the Board of Public Health and the Chelmsford Public Schools. The details are shared in tonight's packet and Dr. Lang shared them on the screen tonight. Ms. Gump enlightened all on the changes and shared that, despite widespread community spread of COVID, that spread has not been seen in the schools. There are 3214 students who are attending school in the hybrid learning model, only six students have tested positive. This led to quarantine of just five students who had close contact. There are 1690 students in the remote model and only two have tested positive. In the school setting there were no students with close contact who ended up testing positive. Ms. Gump said that on the District's website under "COVID" there is a list of sites where testing is being done for the virus.

2. Proposed 2021/22 School Calendar

The proposed academic calendar is shared in tonight's agenda packet. The second page, which details religious holidays, will be forthcoming.

Ms. Newcomb motioned for the school committee to accept the proposed calendar for the 2021/22 academic year. Mr. Moses seconded. Motion carries 5-0.

3. Department and School Presentation Schedule: Spring 2021

This schedule allows department and school personnel to present remotely. Presenters will share how they have dealt with the hybrid and remote learning models. The schedule is part of tonight's agenda packet.

4. Professional Development Opportunity: Diversity and Equity

Dr. Hirsch spoke about an upcoming PD opportunity for staff put together by Stephanie Quinn and Abbey Dick. The offering will be a three-part series in the form of a book group. *How to be an Antiracist* by Ibram Kendy was selected. There will be reading sessions followed by hour-long group discussions. In addition to school staff, administrators will be participating in this PD. This is one of many PD opportunities offered to promote diversity and equity by the district since last summer, including offerings for students.

Liaisons

Ms. Santos will attend the Harrington PTO meeting on December 2nd. Their holiday store which is offered online is doing well. This is a collaboration with Byam and CHIPS. She also thanked Dr. Lang for taking her on visits to CHS, Harrington and McCarthy. She was impressed by the cleanliness of the schools and, particularly impressed, by the technology being used in the classrooms. She was amazed by the students and staff who, while following rules, were fully engaged in the learning process. Ms. Santos also said that "Toys for Tots" is being sponsored by the Student Council at CHS. Donations may be dropped off until December 11th. She also recognized McCarthy's PTO for sponsoring a "Grab and Go" for staff. Another one is scheduled. The CHS PTO will sponsor a "Grab and Go" on December 17th with the students participating as well as the families. Mr. Doherty will attend the Capital Improvement meeting this Thursday. Mr. King attended Center's PTO meeting and is impressed by how much they continue to do with fund-raising, community building activities, and supporting the school staff. This PTO would love more help going forward. They were thankful to the district for the generous supplies of materials for this school year, which helped to lower the burden for those requests to the PTOs and parents across the Chelmsford Public Schools.

New Items

Ms. Newcomb shared that the CHS Alumni Antiracist Curriculum Group will be doing a presentation in January. Dr. Lang shared that Mr. Bill Silver will present updates on technology at the next regular meeting on December 15th. He also hopes that the HVAC report will be available for sharing at that meeting. Dr. Lang said that the upcoming budget and strategic plan will be discussed early in the new year, along with reviews on this school year so far and looking ahead to the 2021/22 school year which will hopefully be a “normal” one!

Public Comments

None.

Adjournment (6:46 p.m.)

Ms. Newcomb motioned to adjourn tonight’s meeting. Mr. Moses seconded. Motion carries 5-0.

*Respectfully submitted,
Sharon Giglio*



Chelmsford Public Schools

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Innovation Pathways



School Committee December 15, 2020

Jon Morris, Stephanie Quinn, Dr. Bobby Lyons

What are Innovation Pathways?

Innovation Pathways are designed to give students coursework and experience in a specific high-demand industry, such as information technology, engineering, healthcare, life sciences and advanced manufacturing.

Innovation Pathways are designed to create strong partnerships with employers in order to expose students to career options and help them develop knowledge and skills related to their chosen field of study before they graduate high school.

-Massachusetts Department of Education

Organizations that have received the Innovation Pathways designation.



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Why are We Pursuing This?

Vision Statement: *Chelmsford High School seeks to provide all students with multiple pathways to optimize their potential for academic excellence, leadership, career development and social and emotional wellness.*

Through the implementation of a career and college readiness program at Chelmsford High School we will:

- *Improve access for all students to higher education through exposure and experience in college level courses while they attend high school. *DE/IP*
- *Provide the potential for college cost savings for students.*DE/IP*
- *Provide access to quality career training for students.*IP*
- *Build partnerships with local colleges and businesses in our community. *DE/IP*
- *Provide a strong foundation for a highly educated and viable future workforce. *DE/IP*



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Which Pathways We Are Pursuing?

For the 2021-2022 academic year, CHS will be pursuing two Innovation Pathways:

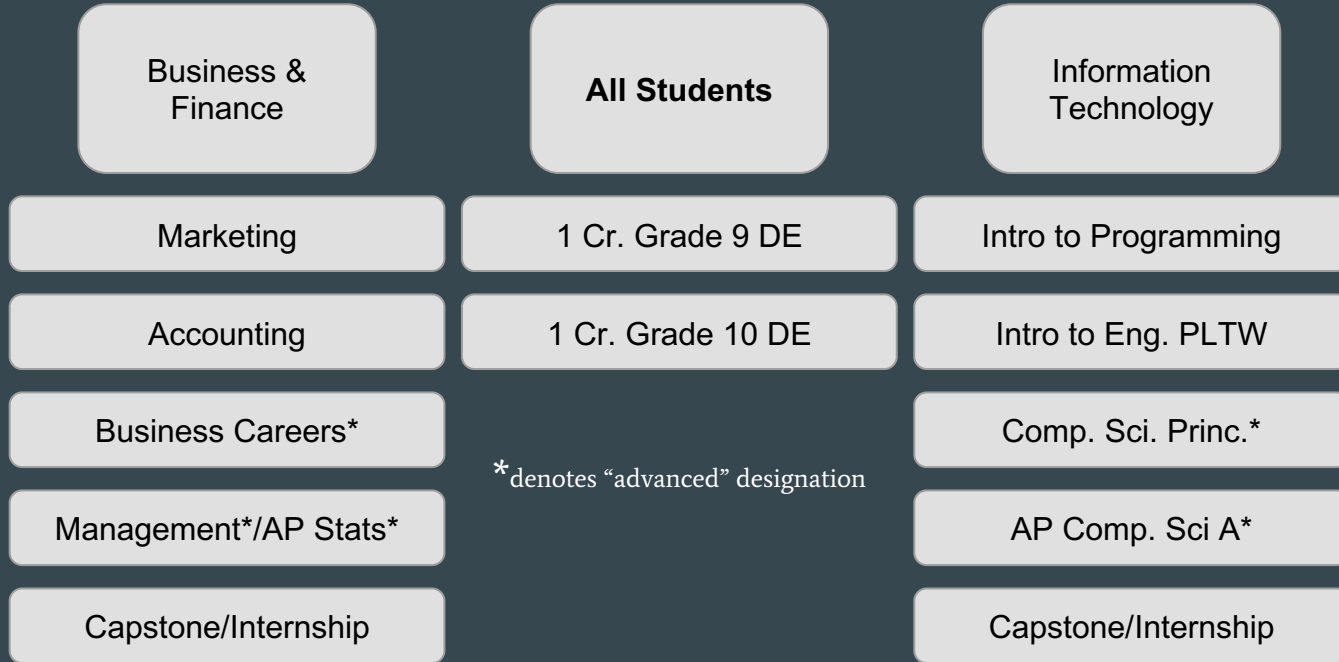
1. Information Technology
 - a. Introduction to Programming, Introduction to Engineering PLTW, AP Computer Science Principles, AP Computer Science A, Capstone/Internship
2. Business & Finance
 - a. Accounting, Marketing, Business Career Pathways DE, Management DE, AP Statistics, Capstone/Internship



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Innovation Pathways FY22



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Timeline

September 22nd: Planning Grant submitted (Awarded \$22.5K)

October 26th: Innovation Pathways Grant Part A (Submitted and accepted!)

November-March: MyCAP training

December-June: Innovation Pathways team planning and outreach (students, staff and community)

February 11th: Innovation Pathways Grant Part B Application is due

August 2021: Implementation for SY22



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Contact Information

For further information or questions:

Jon Morris, K12 Science Coordinator, morrisj@chelmsford.k12.ma.us

Stephanie Quinn, K12 Social Science Coordinator, quinns@chelmsford.k12.ma.us

Dr. Bobby Lyons, Emerson House Dean, lyonsr@chelmsford.k12.ma.us



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CHELMSFORD SCHOOL COMMITTEE

December 2020



Overview / Agenda

The purpose of this report is to review and update the School Committee about the state of technology:

Review of Technology Happenings

Projects – Current/Recent Project Updates

Technology Integration

Upcoming Items & Upcoming Projects

Technology Update

Review

Technology has certainly been a busy department over the past several months. The entire department worked tirelessly to prepare for the return of our teachers and students this year, and has continued to work very dilligently since the opening of school. I simply cannot say enough about the effort put forth by Technicians, Technology Integration Specilaists, Technology Instructors, Librarians and Library Staff, and our Student Database Management Staff. This is a group which is laser focused on providing the best possible support to all technology users whether they are in our buildings or at home. The Chelmsford Public Schools are fortunate to have such a dedicated group, and I am certainly grateful to have them on my team.

Project Updates

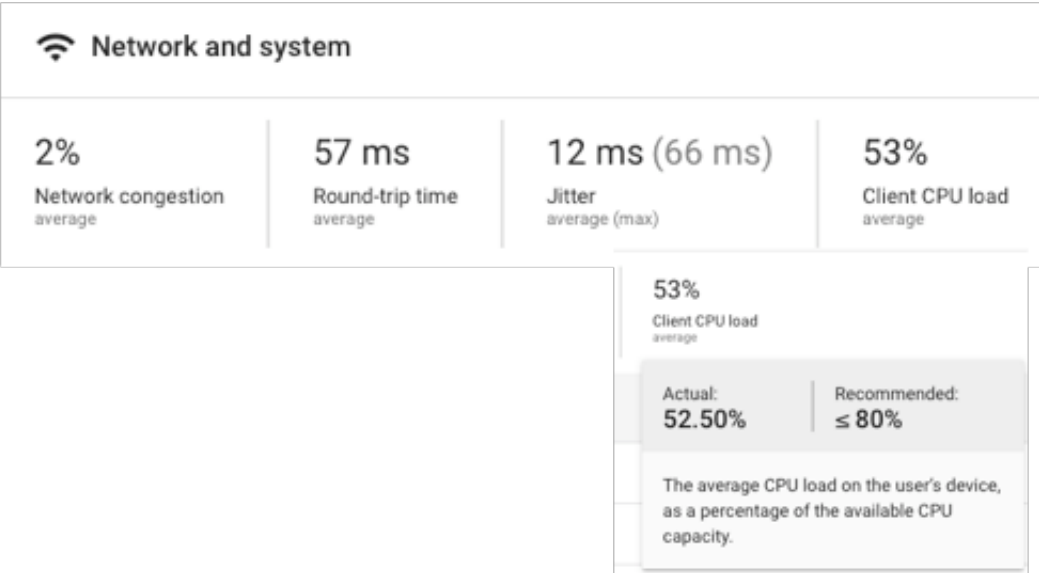
The technology department is constantly in the midst of a variety of projects or work that is designed to enhance the end user experience. This year has been quite a challenge for both the scope of what has been accomplished, and for trying to secure inventory for items we greatly needed. There are still some items that we have been unable to source from any vendor, but for the most part we have brought the students and staff what is needed to make hybrid and remote learning work well. Below is a brief listing of items we have been working on to make this year as academically solid as possible regardless of the learning model anyone has selected.

Classroom Clear Touch Panels: We began the year with many new Clear Touch interactive displays installed throughout the district. We have been installing these as the 1:1 initiative progressed and had hoped to include elementary grade levels as we rolled these out. We began by adding 80 new displays across the middle schools, high school, and elementary schools. Due to some additional school reopening funding we were just able to complete the installation of 115 additional panels. This will cover every learning space in the district. These devices have been fantastic for running Google Meets and interacting with students both in person and remotely. It is amazing to have completed all of these installations in such a short amount of time. The staff has been very excited to receive these displays, and they could not have come at a better time.

Hybrid/Remote Learning Tools: This year every single teaching space required a way to capture video and audio in order to teach students. With the interactive panel installation, we were able to add web cameras for this purpose, and for rooms who did not have web cameras to begin the year we were able to secure a few hundred devices to get us up and running. These devices have allowed our teachers and students to communicate daily, and teachers have been so creative with the use and placements of the cameras to best interact with students.

Google Enterprise Licensing: This year Google rolled out enhanced feature sets for the education platform. In order to gain access to new tools (i.e. breakout rooms, attendance, polls, plagiarism checks etc.) districts were required to purchase and install licensing across the user accounts. The tools and licensing arrived earlier in the school year and have been a nice addition for teachers and students.

Internet Bandwidth: CPS applied for E-Rate funding to increase bandwidth in FY21. This was approved and we added 10Gbps of bandwidth to the district. We have more than enough bandwidth at this point to accommodate all of the work we do with technology during the school day. While bandwidth doesn't completely eliminate intermittent issues with some of the products we use on-line, it is one less thing in the chain that can hinder our overall performance. We have built a very robust network, and with very few exceptions things run very well. Are there blips and occasional bad days? Yes, of course there are days where things are not perfect. We have had one hardware failure this year which caused a bit of a problem for users, and we have had days where Google and other on-line services have simply been overwhelmed by users that can cause unintended freezing or lag when trying to work in a Google Meet. For the most part we have done exceptionally well. We are never satisfied with where we are at, and our Network Administrator constantly looks for ways to fine tune and boost efficiencies to give every user the best possible experience. Below are a few images from the Google Management System which audits our Google Meet performance. We consistently have great results which means our users experience better overall connectivity.



Participant	Type	Starting time	Duration	Location	Protocol	Network congestion % of meeting	Round trip time ms	Jitter ms avg (max)	Client CPU load % average
ipqnlms.com	📺	1:21 PM (Dec 1)	20 min	Chelmsford (US)	UDP	0%	87	7 (2%)	4%
ipqnlms.com	📺	1:21 PM (Dec 1)	20 min	Chelmsford (US)	UDP	0%	35	26 (1%)	46%
ipqnlms.com	📺	1:21 PM (Dec 1)	20 min		UDP	1%	24	6 (1%)	25%
ipqnlms.com	📺	1:21 PM (Dec 1)	20 min	Chelmsford (US)	UDP	0%	44	7 (1%)	44%
ipqnlms.com	📺	1:21 PM (Dec 1)	16 min	Chelmsford (US)	UDP	0%	57	19 (1%)	96%
ipqnlms.com	📺	1:21 PM (Dec 1)	20 min	Chelmsford (US)	UDP	0%	-	7 (1%)	-
ipqnlms.com	📺	1:21 PM (Dec 1)	21 min	Chelmsford (US)	UDP	0%	36	7 (1%)	-
ipqnlms.com	📺	1:21 PM (Dec 1)	20 min	Chelmsford (US)	UDP	0%	31	6 (1%)	29%
ipqnlms.com	📺	1:22 PM (Dec 1)	21 min	Chelmsford (US)	UDP	10%	47	7 (1%)	82%
ipqnlms.com	📺	1:22 PM (Dec 1)	16 min	Chelmsford (US)	UDP	0%	43	6 (1%)	75%

📶 Network and system

2% Network congestion average	57 ms Round-trip time average	12 ms (66 ms) Jitter average (max)	53% Client CPU load average
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🔊 Audio

6 hr 47 min Sent audio all participants	2.9K bps Bitrate (sent) average	0.2% Packet loss (sent) average	good Captured energy average	0.1% Packet loss (received) average	good Played out energy average
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📺 Video

6 hr 42 min Sent video all participants	21 fps Frame rate (sent) average	429K bps Bitrate (sent) average	0.1% Packet loss (sent) average	11 fps Frame rate (received) average	0.1% Packet loss (received) average
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Chromebooks: This year has been a very difficult year to acquire technology devices. We were able to secure our 1:1 devices which were handed out to grade 5 and 9 students prior to the opening of school. We also dismantled all of the district Chromebook carts and made these devices available to families who needed technology for learning this year. We handed out over 3,000 devices this summer to help prepare students for back to school. This was a difficult process due to the sheer volume of devices that needed to be prepared to go home. I would like to thank some of our former interns who worked for us this summer, and a special thank you to my son who volunteered many hours to help prepare rooms and devices for the school year.

We have also been able to secure an additional 3,000 units using a nearly \$260,000 grant award combined with school reopening funding that the Town of Chelmsford generously made available to us. The new devices have arrived at our vendor where they are being given a once over to make sure everything is in working order, having asset tags applied, and enrolled into our Google environment. Once this is complete, we will take delivery of these devices. We will have an opportunity for families who were helping us out by using their own devices to have a chance to use one of ours if they choose. This will come out in a communication once we have received our shipment. These devices will put us in a very good position

for next year as we will be able to replace many of our aging units, and we will be able to use many of these for the next round of the 1:1 initiative.

Security Upgrades: Security system upgrades were worked on at Chelmsford High School and the Westlands School this summer. At present the CHS hardware has been fully installed, and much of the programming has been completed. Westlands hardware installation is nearing completion and there are a few more pieces to take care of before the rest of the hardware can be installed. CHS had over 100 new camera views added to the building. The building leadership was very happy with the outcome of the coverage as they now have a much better view throughout the building. CHS also has a secondary project that involves securing the new guest entrance which was renovated. This will allow us to funnel all visitors through a secure entrance to the right side of the main entrance. All doors at both buildings have had contacts added, so the system will know when doors are opened and closed. Additional card access readers were added to the buildings as well that provides staff several more entry points to access with their security badges. Additionally, security monitors will be hung in the main office, and building leader offices, and alerts will be indicated on the screens to draw attention to any issues the system sees. In April CPS applied for the Safer Schools and Communities Equipment & Technology Grant. Our grant application detailed how we would add more door access control installations throughout CHS. We were informed that we had received the maximum grant award for \$50,000.

E-Rate Cabling & Outdoor WiFi: There were additional funds made available through USAC for the E-Rate program and we were able to receive 20% of what we were allocated for the last 5-year cycle. We used this funding to run some internal connections that will allow us to add outdoor WiFi to all the schools. We had hoped this would be done for back to school, but it will be done by the time the nicer weather returns, and this will give classes an opportunity to be held outside with great connectivity.

Help Request & Inventory System: Over the summer we set up a new help request and inventory system. The new product is called Incident IQ (IIQ for short), and this system allows us to keep much better track of exactly what requests are being entered and where they are coming from. Users are synced from the Active Directory and Google systems, inventory is imported from Google Management and some is done manually, and now every user has a way to enter a help request. All teachers and students can open a request by signing in with their google account. Inventory items will ultimately be tied to individuals, so they can choose from a list of items they “own” and let us know specifically what device or software system they are using and require help with. In addition, parents can access the IIQ help page from our website and enter requests for anything they need assistance with even if it is not technology related. As this system becomes more refined it will help us to better track all inventory and find additional ways to become more efficient in how we service our customers.

Technology Integration and Professional Development

This has been a year unlike any other when it comes to teaching and learning with technology. While technology integration has always been an important piece of curriculum dissemination, it has become much more crucial this year. Our Technology Integration Specialists, Library Staff, and Technical Staff

have worked so hard since last March to help every student and teacher build their skills with the wide array of tools we have for teaching and learning. Here are a few highlights since the beginning of school.

Fall Graduate Level Blended Learning Class: 18 participants (bringing the total we have trained over the past two years to over 120 teachers).

10 Full Day PD: Before schools opened our TIS were available for the first 10 days to help teachers become familiar with the new ClearTouch Displays and other technology items which would help them this year. Every grade level and every specialist/service provider were given an opportunity for training.

Daily PD Offerings: Our TIS group offers daily training opportunities to all staff. These are generally one-hour lessons which focus on all the tools we rely upon to teach. As new updates/advancements are made to existing products we immediately add this to the training. So far there have been over 300 learning opportunities made available to staff.

Wednesday Instant Support: On Wednesdays many staff work remotely. We wanted to find a way to quickly support them if something came up while they were outside the building. The TIS group staffs a live help Google Meet which teachers can join and receive instant help.

Half-Day PD: We have been able to run various training opportunities for staff on the first two half days. We focused on our paraprofessional group to help them feel more comfortable with the Google products they are assisting with on a daily basis. Curriculum Coordinators also took time to work with their teachers about some ways to use some of our curriculum related tools, and Special Education recently ran a great professional development for a tool they buy which can read/speak and help students engage better with various websites they use.

Tips and Tricks for 2020: A wide variety of quick instructional you tube videos has been created to help all parents and students navigate their devices and the products being used for instruction. This is a great resource, and in fact other towns have reached out to ask to use these resources with their families.

As you can see there have been a very wide variety of offerings to date, and these opportunities will continue throughout the year. I'm extremely proud of the amazing work all of our technical staff has done to support our students, parents and staff.

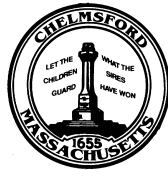
Upcoming Technology

We are always looking ahead in technology. It is important to keep an eye on the future in an effort to deliver the best possible experiences to our end users. Here are just a few of our upcoming tasks and initiatives.

- **MCAS/ACCESS:** Testing for the January MCAS has been suspended by DESE, but they are planning for all students to take this test in the spring. Next month ACCESS testing will begin, and all of the technology for this is prepared. Tested, and ready to go.
- **iReady Diagnostic:** All students in K-8 will begin their next iReady diagnostic soon. This will help all teachers in Math and ELA gauge where students are in relation to the standards, they have already taught this year.

- We were able to secure additional devices through our RLTE Grant and school reopening funding. These devices will be ready to go soon, and we will reach out to families to let them know if they did not take a device in an effort to help us out this summer, they can now take one because we will have enough for everyone who did not receive one.
- We will be re-provisioning our Chromebook carts for the elementary schools, and our goal will be to have a cart for each homeroom in every elementary school for next September. This will allow all students in K-4 to have access to devices much more frequently and remove the need to share anything amongst multiple users.
- We will roll out our next wave of 1:1 devices. This will be the third year of the rollout, and at the conclusion of the distribution all students in grades 5-7 and 9-11 will have their own devices. We will also be working to refurbish all returned devices from this year in an effort to outfit grade 8 and grade 12 with devices for next year.
- Elementary schools will receive security upgrades. New cameras will be installed throughout the schools and enhance the views available to each school. All doors will have contacts installed, and panic buttons will be installed in the main offices and the detached portable classrooms to enhance security in every location our students and teachers spend time. This will be a great addition to the elementary schools and will complete our overall security upgrade to the district.

In closing, I would like to once again thank my entire team for all of the amazing work they have done. This group has gone above and beyond in an effort to provide the best possible support to all of our users. I would also like to say a quick thank you to all of our staff members who have worked very hard this year to provide the best possible learning environments for our students. It has not been an easy year for students, families, or staff, but through hard work and a passion for educating, our staff has truly made learning in our current models very positive for students. Finally, I would like to say how great the entire school community has been throughout the year. I have had the pleasure of interacting with so many parents and every interaction has been nothing short of fantastic. Our parents and care givers have been so patient, understanding, and helpful as we have tried to work through problems with them. Great communication with families is so important, and I'm happy the Technology Department has been able to be a resource for everyone this year. We look forward to continuing to build on these positive interactions and relationships.



TOWN OF CHELMSFORD
DPW / DIVISION OF PUBLIC FACILITIES

TO: Jay Lang, Ed.D., Superintendent of Chelmsford Public Schools
FROM: Kathleen Canavan, AIA, Public Facilities Manager
SUBJECT: Facilities Response: 2020 HVAC Assessment for Chelmsford Public Schools
DATE: December 10, 2020

The Town of Chelmsford Division of Public Facilities (“Division”) contracted with **Consulting Engineers** and **Balancing Technologies** in October 2020 to conduct an independent third-party evaluation of Chelmsford Public Schools’ Heating, Ventilation and Air-Conditioning (HVAC) building systems. Together, the two firms investigated the mechanical systems district wide, tested the ventilation in approximately 25% of instructional spaces, and provided a report of findings based on current industry standards. Please see Appendix A for further details on the defined scope of work, requirements, and town contributions.

Following their investigation, CMTA Consulting Engineers provided a report on December 3, 2020. Please see Appendix B for the full text of Chelmsford Public Schools HVAC Assessment.

The Division, in consultation with CMTA engineers, mechanical and controls contractors, and Town and School officials, has developed a systematic and preventative focused approach to addressing ventilation remediation within the district as identified in the report. The Division remains focused on providing safe and functional spaces, equipment and systems that support the mission of Chelmsford Public Schools. The extent of this work is divided into three phases that are currently underway:

1. **Phase I: Service Enhancements**

The Division has increased current service hours with the existing mechanical and controls contractors to continue to proactively address and repair issues as they arise, as well as address issues identified in the report. Throughout the heating season, the mechanical contractor has been increased from 2 days/week to 5 days/week in district. Further, the controls contractor has been increased from 2 days/bi-weekly to 2 days/weekly. In order to provide an enhanced level of service, the mechanical and controls contractors, school custodians, facilities maintenance division are working together with the Sustainability Manager who is overseeing the work and documenting repairs as they are completed.

2. **Phase II: HVAC Assessment**

In response to the report, the Division will complete a comprehensive assessment across the district (100% of instructional spaces), and repair and balance the entire system in conjunction with the mechanical contractor, controls contractor and a testing and balancing contractor. This work will address remediation strategies as outlined in

the report on mechanical equipment including centralized air handler units (AHUs), exhaust fans (EFs), and unit ventilators (UVs).

- a. *Mechanical Assessment and Repairs*: a mechanical contractor will survey the equipment, document any deficiencies, and complete necessary repairs.
- b. *Direct Digital Controls*: a controls specialist will work in conjunction with the mechanical contractor to review and test the sequence of operation for the mechanical equipment.
- c. *Testing and Balancing*: a testing and balancing contractor will adjust the mechanical equipment to meet the recommended ventilation standards and guidelines for indoor air quality, in accordance with ASHRAE 62.1 in normally occupied classrooms.

3. **Phase III: Capital Improvements**

Based upon the findings and recommendations outlined in the HVAC report, and findings from Phase I and Phase II the Division will provide a list of capital projects to be presented to Town Meeting for funding. To date, several projects have already been identified:

- a. South Row Elementary School Trend Upgrade
 - i. Upgrade existing network infrastructure, BACnet controller for each UVs, and steam boilers BAC net IP controller
- b. McCarthy Middle School Trend Upgrade
 - i. Upgrade existing network infrastructure, BACnet controllers for (69) UVs, hot water system, Trend BACnet IP controller to connect to (4) boilers, and BACnet MS/TP controller for the Library Air Handler
- c. Center School Exhaust Fans
 - i. Switching from pneumatic to direct digital controls on the newly installed exhaust fans. This scope of work needs to be developed and priced.
- d. Modular Classrooms
 - i. Adding controls to the “new” portable classrooms at Center, Byam, South Row, and Harrington Schools. This scope of work needs to be developed and priced.
- e. Any other projects that may arise, mechanical, controls or other.

Appendix A:

The contract for services as outlined below, was awarded to CMTA on October 14, 2020. The report was delivered on December 3, 2020 (Appendix B).

SCOPE OF SERVICES:

1. Buildings: Field survey of one (1) high school, two (2) middle schools, four (4) elementary schools and one (1) community education building. Survey work will occur during regular daytime occupied hours.
2. Validation: In each instructional space (~394 spaces), the HVAC system's basic operation will be validated (i.e. fans are functional with airflow observed).
3. Survey with TAB Contractor: In 25% of the instructional spaces identified by the district (100 spaces), the unit ventilator cabinets will be removed and the unit's will be visually inspected for operation and condition to include:
 - a. Condition of filter.
 - b. Fan speed observation at low, medium, high speeds.
 - c. Damper actuators and control valve actuators inspected.
 - d. Room exhaust airflow will be verified where applicable.
 - e. District personnel will identify critical rooms for all buildings to be included in the survey.
 - f. Include ventilation code analysis based on reduced occupancy and normal occupancies.
 - g. A TAB contractor, under separate contract, will measure SA, RA, OA & EA airflows in these spaces with the UVs operating at their current normal fan speed. Engineer will use this data to validate code analysis calculations.
 - h. The following number of spaces to assess was provided by the district as follows:
 - i. Chelmsford HS – 31 rooms
 - ii. McCarthy MS – 15 rooms
 - iii. Parker MS – 16 rooms
 - iv. Byam ES – 8 rooms
 - v. Center ES – 8 rooms
 - vi. Harrington ES – 8 rooms
 - vii. South Row ES – 7 rooms
 - viii. Community Education Building – 7 rooms
4. Include HVAC system evaluation based off EPA Healthy Indoor Environments for Schools and ASHRAE Epidemic Task Force reports.
5. Review buildings other systems for potential MERV 13 filter upgrades for centralized systems. District to provide filter inventory.

TOWN CONTRIBUTION:

1. The district is currently implementing upgrades to Unit Ventilators (UV) and Roof Top Units (RTUs) from MERV 8 filters to MERV 11 or 13 filters where applicable.
2. District to provide filter cutsheets for proposed MERV 11 filters for analysis of potential impact on UVs. Upgrades to MERV 13 for the UVs will not be included.
3. The TAB scope will occur in conjunction with this assessment so as not to disturb the buildings more than once. The district shall contract directly with a TAB contractor and engineering firm will provide oversight and scheduling with the district's vendor.

4. The district will provide an HVAC technician escort during the walk through to assist accessing internal components of units. The units will be pre-opened. The district will access the EMS at the same time while we are on site to provide relevant data.
5. The district will provide anticipated reduced (and normal) occupancies in the various instructional spaces. In general, the typical classroom holds 25 students and will reduce to 12 students. Specific numbers will be provided based on the final room selections for the survey for the purposes of the ventilation rate validation.
6. The district has provided basic PDF floor plans for each building with critical rooms identified for the survey.
7. The district will provide available PDFs of existing HVAC drawings.
8. The district has provided the current operating schedules per building in separate correspondence. The EMS currently operates the HVAC systems from 4am-6pm M-F.
9. The district will provide filter cutsheets for proposed for UVs and RTUs.
10. The district will provide the filter inventory for UV and RTU systems.

DELIVERABLES:

1. The deliverable to include a written report with an executive summary, technical details and spreadsheet calculations.
2. Upon completion of the surveys, a draft report will be prepared for review. A meeting will be held and any comments will be used to update the report to a final version.
3. Presentation to School Committee and Superintendent with Q&A session.

QUALIFICATIONS:

1. Met submittal process.
2. Massachusetts Registered Professional Engineer.
3. Project Manager to have 10 years of experience working in the public-school sector. Please include a resume.
4. Ability to demonstrate experience in progressive problem solving for an HVAC assessment of a similar size and scope.
5. Prior experience delivering engineering services for an HVAC assessment for a public-school district.



Chelmsford Public Schools HVAC Assessment

December 3, 2020



December 3, 2020

Melissa Joyce
Sustainability Manager
Town of Chelmsford
50 Billerica Road
Chelmsford, MA 01824

Re: Chelmsford Public Schools
HVAC Systems Assessment

Dear Melissa:

In collaboration with the Town of Chelmsford and Balancing Technologies, CMTA is pleased to submit our HVAC Assessment Report for Chelmsford Public Schools. This report is focused on evaluating the classrooms and other specific rooms identified by the District associated with student, faculty and staff occupancy during the pandemic. The overall goal of this HVAC assessment was to evaluate ventilation air flows and filtration measures in specific locations in the various school buildings as well as high-level HVAC equipment operations throughout the instructional spaces.

The recommendations and strategies included in this assessment are based on current industry standards and guidance including:

- a. ASHRAE 62.1 – Ventilation for Acceptable Indoor Air Quality,
<https://www.ashrae.org/technical-resources/bookstore/standards-62-1-62-2>
- b. Schools for Health – Risk Reduction Strategies for Reopening Schools – Harvard T.H. Chan School of Public Health
<https://schools.forhealth.org/wp-content/uploads/sites/19/2020/06/Harvard-Healthy-Buildings-Program-Schools-For-Health-Reopening-Covid19-June2020.pdf>
- c. EPA Healthy Indoor Environments for Schools
<https://www.epa.gov/iaq-schools/epa-supports-healthy-indoor-environments-schools-during-covid-19-pandemic>
- d. ASHRAE Epidemic Task Force
<https://www.ashrae.org/technical-resources/reopening-of-schools-and-universities>

It should be noted that reduced enrollment, combined with the ability to maintain social distancing, validating and increasing the fresh air ventilation rates and where possible improving filtration all will contribute to reducing the potential of the spread of COVID 19 as it pertains to the school building's mechanical systems.

The scope of this assessment consisted of the following:

1. The team field surveyed one (1) high school, two (2) middle schools, four (4) elementary schools and one (1) community education building.



2. For each space (~429 spaces), the HVAC system's basic operation was validated. This process involved determining if the individual room's HVAC equipment fans were functioning as well as corresponding exhaust system where applicable.
3. For 25% of the spaces identified by the district (~100 spaces), the unit ventilator cabinets, where applicable, were removed and the units were visually inspected for operation and condition including (1) condition of filter, (2) fan function, (3) damper and control valve actuator operation, and (4) supply, return, ventilation and exhaust air measurements were taken by TAB contractor at the normal fan speed operation. Note that for spaces without unit ventilators, observations of the systems and air flow measurements were taken where applicable.
4. With the survey information and field-measured test data for the 25% sampling set noted, we have provided ASHRAE 62.1 ventilation code analysis based on the Owner-provided reduced occupancies and normal occupancies. We have also included total room air exchange rate (ACH) calculations indicating how often air is filtered and circulated in the rooms.
5. It should be noted that the district is currently implementing upgrades to Unit Ventilators (UV) from MERV 8 filters to MERV 11 filters. Where applicable, the team reviewed the building's other systems for potential MERV 13 filter upgrades for centralized systems.

The implementation of certain recommendations and strategies presented will be limited based on design, age and capacity and condition of the building's mechanical systems which varies across the District. These recommendations are subject to the functionality of existing equipment and systems including building management controls which would be used to modify original design and/or standard operating procedures. Also, it should be understood that these measures and recommendations are based on emergency measures meant to assist the District with its pandemic planning for re-occupancy. Considerations of energy efficiency and comfort maybe sacrificed in order to meet recommendations established in this report. As the seasons transition from cooling to heating and vice-versa, these issues may become more critical and may not be practical if the pandemic continues throughout extreme weather conditions. Please keep this in mind while you consider the report's recommendations and manage the District's expectations.

We hope you and the District find this information useful as you develop your plan to return to school in full capacity and meet the challenges by this pandemic. Let us know if you have any questions or comments. We appreciate your help and assistance with this assessment.

Sincerely,

A handwritten signature in black ink, appearing to read "Jess E. Farber", with a stylized flourish at the end.

Jess E. Farber, PE
Vice President



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I – Executive Summary

Improving indoor air quality to reduce the spread of the virus and help maintain clean surfaces is a key strategy that can be incorporated into a layered defense against COVID-19. Current HVAC guidance (Engineering Controls) calls primarily for three risk mitigating actions:

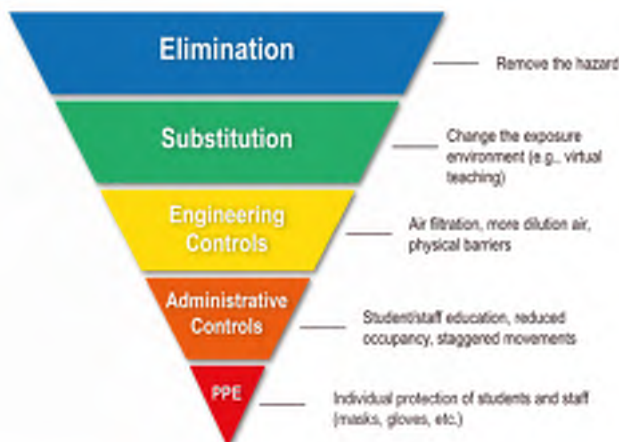
- Validate and increase HVAC system outdoor air ventilation as needed
- Add or increase air filtration
- Consider supplementing systems with air cleaning devices



Figure 1 - Harvard Healthy Buildings HVAC Decision Tree

In addition to the current efforts the Town has implemented since March of 2020, there are short-term measures to consider related to the building’s HVAC systems specifically to improve indoor air quality and reduce airborne concentrations and exposures. We first focus on the two major approaches for indoor air quality upgrades – (1) validate and increase dilution with additional fresh air as needed and, (2) increase air filtration with more efficient filters. More of both is better. From there, additional options can be explored as appropriate.

The following sections of this report explore possible strategies for implementing HVAC improvements based on the types of systems currently in use and the findings of the assessment. Every potential strategy includes an illustration of the concept and a list of Pro’s and Con’s. The information in this report is based on the very latest recommendations but the COVID-19 crisis remains an ever-evolving situation and this assessment and our recommendations are not intended to override or supersede any future guidance from health and government experts.



It is important to note that the following HVAC strategies and Engineering Controls are means to improve the air quality and reduce risk but will not prevent all possibility of virus transmission. HVAC improvements are intended to be used as part of an overall risk reduction strategy for reopening schools that includes many aspects including: PPE, masks, cleaning protocols, reduced class sizes, social distancing, signage, reducing traffic in high traffic areas, touchless services, and others as depicted in the adjacent diagram.



It should be noted that the existing buildings and mechanical systems were designed to codes, standards and best practices that were applicable at the time of construction and may have limitations with the ability to easily achieve some strategies. Where modifications to existing HVAC systems are not possible due to system or capacity limitations, ASHRAE recommends that in these unavoidable events to install portable filtration and air cleaning devices such as UVGI (Ultraviolet Germicidal Irradiation). Additionally, certain items within this report will require capital expenditures to upgrade the systems to comply with the recommendations. Retro-commissioning and re-balancing of the systems is also recommended.

Also, note that since March of 2020, the Town of Chelmsford has put into place many COVID-19 related HVAC system strategies in the school buildings such as:

- a. Increasing building air ventilation rates, filtering and flushing by operating the school's HVAC systems 2 hours prior to normal scheduled occupancy and turning off 2 hours after normal scheduled occupancy.
- b. Installing portable air filtration units in ~60 locations across the various schools.
- c. Repair and replacement of exhaust fans.
- d. Installing MERV 13 filters in central HVAC equipment and MERV 11 filters in unit ventilators where possible as product has become available.
- e. Classroom occupancies have also been reduced to promote social distancing.

The districts' ventilation and filtration systems can be summarized into two major categories for the typical classrooms and instructional spaces in the various schools as follows:

A. Centralized Air Handling Systems with Filters

1. Chelmsford High School - Central/Core Areas (25 HVAC units)
2. McCarthy Middle School – Modular Classrooms (5 HVAC units)
3. Parker Middle School – Modular Classrooms (9 HVAC units)
4. Byam Elementary School – Modular Classrooms (6 HVAC units)
5. Center Elementary School – Modular Classrooms (5 HVAC units)
6. Harrington Elementary School – Modular Classrooms (6 HVAC units)
7. South Row Elementary School – Modular Classrooms (6 HVAC units)

Category “A” Options

- a. These types of HVAC systems have the most flexibility and adaptability for potential ventilation and filtration upgrades.
- b. Filtration improvements include upgrading to the recommended higher MERV ratings of 13 for Air Handling Units.

- c. Ventilation improvements include retro-commissioning DDC controls and rebalancing to the ventilation rates through the central rooftop units per the calculations tables and within the capacity limitations of the packaged units and central plant infrastructure.
- d. Additionally, regular preventative maintenance and cleaning is recommended to ensure system operations have not changed. Over time, mechanical systems will shift out of calibration as was witnessed during our walk-throughs.



B. In-Room Unit Ventilators with Filters

1. Chelmsford High School - (81 units)
2. McCarthy Middle School - (62 units)
3. Parker Middle School - (45 units)
4. Byam Elementary School - (31 units)
5. Center Elementary School - (30 units)
6. Harrington Elementary School - (34 units)
7. South Row Elementary School - (29 units)
8. Chelmsford Community Education Building - (23 units)

Category “B” Options

- a. In general, the existing filtration levels are currently MERV 8. The district currently has a plan in place to upgrade all filters in these types of units to a higher level of MERV 11. In addition, this process is well underway and the upgrades are occurring as product arrives in the district.
- b. Ventilation improvements include retro-commissioning DDC controls and rebalancing to the ventilation rates through the unit ventilators per the calculations tables and within the capacity limitations of the units and central plant infrastructure.
- c. We recommend that the tops of the units not be used for storage.
- d. We recommend that the unit ventilators and room exhaust grilles be left un-obstructed in order to optimize the ventilation effectiveness within the space.
- e. We recommend that student or staff desks be placed at least 6 ft away from the units.



- f. Additionally, regular preventative maintenance and cleaning is recommended to ensure system operations have not changed. Over time, mechanical systems will shift out of calibration as was witnessed during our walk-throughs.



C. Overall District Summary

For 25% of the spaces identified by the district (~100 spaces), the applicable supply, and ventilation air measurements were taken by TAB contractor. With the survey information and field-measured test data for the 25% sampling set noted, we have provided ventilation air code analysis based on the Owner-provided reduced occupancies and normal occupancies. We have also included air exchange rate (ACH) calculations.

The summary of the data of the sample set compares two criteria:

- a. Minimum Ventilation Rates for Acceptable Indoor Air Quality per ASHRAE 62.1 which is current the standard and practice. While the methodology of the ventilation calculation procedures has changed in the past 20 years, the end results and requirements have not significantly changed.
 - b. Total room air exchanges per hour. We have provided the analysis based on 4 air exchanges per hour (total room air turnover once every 15 minutes). All of this air is filtered through the HVAC equipment and also diluted with fresh air from outdoors. The Harvard School for Public Health considers a range of 4-5 air exchanges per hour to be Good with higher being better.
1. Based on **reduced** occupancy rates, an overall district average shows **61%** of rooms sampled are provided with mechanical minimum ventilation rates based on ASHRAE 61.1. Of these rooms, the ventilation rates are more than double the minimum required rates on average.
 2. Based on **normal** occupancy rates, an overall district average shows **38%** of rooms sampled are provided with mechanical minimum ventilation rates based on ASHRAE 62.1. Of these rooms, the ventilation rates are 50% more than double the minimum required rates on average.

3. For **72%** of rooms sampled, total air exchanges exceed the minimum target of 4 total room air changes per hour.
4. **Short-Term Goals** based on Reduced Occupancies
 - a. Chelmsford High School – Rooftop Unit Ventilation Improvements
 - b. McCarthy Middle School – Unit Ventilator Improvements
 - c. South Row Elementary School – Unit Ventilator Improvements
 - d. District Wide – Upgrade Filtration in HVAC Equipment
 - e. District Wide – Portable Classroom - Rooftop Unit Ventilation Improvements
 - f. District Wide – Exhaust Fans Operational
 - g. District Wide – Consider moving staff & students into spaces with appropriate ventilation and filtration levels.
5. **Long-Term Goals** based on Normal Occupancies
 - a. Expand Preventative Maintenance Plan including regular ventilation testing validation for unit ventilators and air handling equipment.
 - b. District Wide – Develop long term replacement plan for air handling equipment and ventilation systems.
 - c. Consider HVAC Upgrades in various spaces without adequate HVAC as noted in Site Specific Recommendations section of the report.
 - d. Reduce air infiltration and seal around the air plenum cavities at unit ventilators at Byam ES, Harrington ES & Community Education Building.
6. **Immediate Next Steps**
 - a. The following next steps should remedy the majority of the deficiencies observed upon completion of these tasks.
 - b. The Town should hire a test and balance contractor to comprehensively rebalance the systems to obtain the recommended airflows.
 - c. The rebalancing effort should be accomplished in parallel with the control's vendor and the mechanical service vendor to address any issues or reprogramming needs as they arise. Additionally, freeze-stat operations should be checked and validated at all equipment to avoid coil freezing issues in the winter months.
 - d. Survey all exhaust fans and make functional through control settings and/or repairs.
 - e. Continue daily monitoring of equipment operations and space temperatures through the EMS platform.
 - f. In 2017 many of these systems were rebalanced due to thermal comfort issues occurring at that time. It should be noted that rebalancing to the recommended airflows could generate thermal comfort complaints. During the pandemic situation, thermal complaint issues should be noted and only addressed in extreme circumstances.
 - g. Upon completion of these tasks, the Town should reassess any remaining deficiencies and determine appropriate action steps.

II – Site Specific Observations & Recommendations

Chelmsford High School

1. 122 rooms inspected of which detailed inspection and analysis was completed for 31 rooms.
2. Of the 16 unit ventilators inspected, all except 4 units were observed to be operational including controls.
 - Based on normal occupancy levels, 11 of the units were not delivering appropriate ventilation air to the space.
 - Based on reduced occupancy levels, 4 of the units were not delivering appropriate ventilation air to the space.
 - Filters were observed to be in good condition, except one (1) filter in very poor condition. We left this filter out of the unit and informed the maintenance staff of the situation.
3. Other rooms inspected were supplied and ventilated from central rooftop equipment (RTU-3, 6, 7, 8, 9, 10, 11, 15, 17 & 22). Most were under-performing in terms of ventilation rates which is a common occurrence in older systems such as these.
 - Based on normal occupancy levels, 12 of the units were not delivering appropriate ventilation air to the space.
 - Based on reduced occupancy levels, 10 of the units were not delivering appropriate ventilation air to the space.
 - Filters were observed to be a mix of good and poor condition. Filters need to be replaced in 5 of the units observed.
4. Total air exchanges exceed the minimum target of 4 air changes per hour in 22 of the 31 rooms inspected.
5. The high-level observations of all other spaces indicated that the vast majority of the unit ventilators had supply air and varying amounts of ventilation air, but not exhaust air. Many of the exhaust ducts in the classroom spaces were observed to have no airflow.

Recommendations

1. For unit ventilators:
 - a. Continue to upgrade filters MERV 11 filters and inspect/replace regularly.
 - b. Make all units operational. Retro-commission DDC controls and sequences. Ensure fan speed setting is correct.
 - c. Rebalance to recommended ventilation rates, where possible.
 - d. Ensure all units and exhaust grilles are clear from desks and other objects for optimal ventilation effectiveness.
 - e. P.M. to include cleaning of units and coils.
 - f. Make all exhaust fans operational and rebalance.
2. For centralized air handling systems:
 - a. Upgrade filters to MERV 13 filters and inspect/replace regularly.
 - b. Retro-commission DDC controls and sequences.
 - c. Rebalance to recommended ventilation rates, where possible.
 - d. P.M. including cleaning of units including cooling coils, ensure condensate traps are functional, tighten fan belts and replace as needed.
 - e. Make all exhaust fans operational and rebalance.

McCarthy Middle School

1. 73 rooms inspected of which detailed inspection and analysis was completed for 15 rooms.
2. During our first visit, the unit ventilators did not operate based on command. Damper actuators would modulate only upon reset of power. During re-inspection, the same circumstances occurred.
3. The building was observed to be mechanically negatively pressurized.
4. Of the 12 unit ventilators inspected, all were observed to be operational including controls but there was no communication ability through the central controls system.
 - Based on normal occupancy levels, 9 of the units were not delivering appropriate ventilation air to the space.
 - Based on reduced occupancy levels, 7 of the units were not delivering appropriate ventilation air to the space.
 - Filters were observed to be a mix of good and poor condition. Filters need to be replaced minimally in 3 of the units observed.
5. The “modular” classrooms are served from central rooftop equipment.
 - One classroom and rooftop unit was inspected. The system used ducted supply and the ceiling plenum for return air.
 - This unit has no outside hood to allow for mechanically delivered ventilation air to the space.
 - The filter was observed to be good condition.
6. Total air exchanges exceed the minimum target of 4 air changes per hour in 10 of the 15 rooms inspected.
7. The high-level observations of all other spaces indicated that most of the unit ventilators had supply air and ventilation air, but not exhaust air. 17 exhaust fans serving the classroom areas were observed to be non-functional.

Recommendations

1. For unit ventilators:
 - a. Continue to upgrade filters MERV 11 filters and inspect/replace regularly.
 - b. Make all units operational. Retro-commission DDC controls and sequences. Ensure fan speed setting is correct.
 - c. Rebalance to recommended ventilation rates, where possible.
 - d. Ensure all units and exhaust grilles are clear from desks and other objects for optimal ventilation effectiveness.
 - e. P.M. to include cleaning of units and coils.
 - f. Make all exhaust fans operational and rebalance.
2. For rooftop unit systems:
 - a. Upgrade filters to MERV 13 filters and inspect/replace regularly.
 - b. Investigate ability to upgrade units with mechanical ventilation and balance to recommended ventilation rates, where possible.
 - c. P.M. including cleaning of units including cooling coils, ensure condensate traps are functional, tighten fan belts and replace as needed.
3. Consider HVAC upgrades in Room 140 (currently no supply or exhaust) and 1st Floor Office (currently minimal exhaust only).

Parker Middle School

1. 57 rooms inspected of which detailed inspection and analysis was completed for 16 rooms.
2. During our first site visit, unit ventilator controls were not functioning properly and the OA and RA dampers were both observed closed. We temporarily suspended the analysis in the building until controls could be made functional.
3. Of the 13 unit ventilators inspected, all were observed to be operational including controls, except for a concealed unit in Room 212 (IPAD Room).
 - Based on normal occupancy levels, 3 of the units were not delivering appropriate ventilation air to the space.
 - Based on reduced occupancy levels, only 1 of the units was not delivering appropriate ventilation air to the space (Room 212).
 - Filters were generally observed to be in fair condition and are in need of replacement soon. We could not access the filter in Room 212.
4. The “modular” classrooms are served from central rooftop equipment.
 - Two classrooms and rooftop units were inspected. The system used ducted supply and the ceiling plenum for return air.
 - These units have no outside hood to allow for mechanically delivered ventilation air to the space.
 - The filters were observed to be good condition.
5. Total air exchanges exceed the minimum target of 4 air changes per hour in 14 of the 16 rooms inspected.
6. The high-level observations of all other spaces indicated that the vast majority of the unit ventilators had supply air, ventilation air, and exhaust air.

Recommendations

1. For unit ventilators:
 - a. Continue to upgrade filters MERV 11 filters and inspect/replace regularly.
 - b. Make all units operational. Retro-commission DDC controls and sequences. Ensure fan speed setting is correct.
 - c. Rebalance to recommended ventilation rates, where possible.
 - d. Ensure all units and exhaust grilles are clear from desks and other objects for optimal ventilation effectiveness.
 - e. P.M. to include cleaning of units and coils.
 - f. Make all exhaust fans operational and rebalance.
2. For rooftop unit systems:
 - a. Upgrade filters to MERV 13 filters and inspect/replace regularly.
 - b. Investigate ability to upgrade units with mechanical ventilation and balance to recommended ventilation rates, where possible.
 - c. P.M. including cleaning of units including cooling coils, ensure condensate traps are functional, tighten fan belts and replace as needed.
3. Consider HVAC upgrades in Workroom which currently has only fin-tube heat and a large non-functioning wall exhaust fan.

Byam Elementary School

1. 40 rooms inspected of which detailed inspection and analysis was completed for 8 rooms.
2. Of the 5 unit ventilators inspected, all were observed to be operational including controls. A false wall has been constructed for return and outside air. There is a lot of leakage around the walls, so the measurements taken are not a reliable to the true conditions.
 - Based on normal and reduced occupancy levels, all 5 units were delivering appropriate ventilation air to the space.
 - Filters were observed to be a mix of good and poor condition. Filters need to be replaced in 2 of the units observed.
3. The “modular” classrooms are served from central rooftop equipment.
 - One classroom and rooftop unit was inspected. The system used ducted supply and the ceiling plenum for return air.
 - Based on normal and reduced occupancy levels, this unit is not delivering appropriate ventilation air to the space.
 - The filter was observed to be good condition.
4. Reading C1 only contains fin-tube baseboard heat and does not contain ventilation or exhaust systems. The adjacent connecting storage room has exhaust.
5. Nurse room consists of a packaged through-wall type HVAC unit with no ventilation air and no exhaust system.
6. Total air exchanges exceed the minimum target of 4 air changes per hour in 6 of the 8 rooms inspected.
7. The high-level observations of all other spaces indicated that the vast majority of the unit ventilators had supply air, ventilation air, and exhaust air. Eight exhaust fans serving the classroom areas were observed non-functional.

Recommendations

1. For unit ventilators:
 - a. Continue to upgrade filters MERV 11 filters and inspect/replace regularly.
 - b. Make all units operational. Retro-commission DDC controls and sequences. Ensure fan speed setting is correct.
 - c. Rebalance to recommended ventilation rates, where possible.
 - d. Ensure all units and exhaust grilles are clear from desks and other objects for optimal ventilation effectiveness.
 - e. P.M. to include cleaning of units and coils.
 - f. Make all exhaust fans operational and rebalance.
2. For rooftop unit systems:
 - a. Upgrade filters to MERV 13 filters and inspect/replace regularly.
 - b. Investigate ability to upgrades units with additional mechanical ventilation and balance to recommended ventilation rates, where possible.
 - c. P.M. including cleaning of units including cooling coils, ensure condensate traps are functional, tighten fan belts and replace as needed.
3. Consider HVAC upgrades in Reading C1 and Nurse Room.
4. As unit ventilators get replaced, the false wall condition should be remedied.

Center Elementary School

1. 34 rooms inspected of which detailed inspection and analysis was completed for 8 rooms.
2. Of the 7 unit ventilators inspected, all were observed to be operational including controls.
 - Based on normal occupancy levels, 3 of the units were not delivering appropriate ventilation air to the space.
 - Based on reduced occupancy levels, all 7 units were delivering appropriate ventilation air to the space.
 - Filters were generally observed to be in good condition except 1 filter in fair condition.
3. The “modular” classrooms are served from central rooftop equipment.
 - One classroom and rooftop unit was inspected. The system used ducted supply and the ceiling plenum for return air.
 - Based on normal and reduced occupancy levels, this unit is not delivering appropriate ventilation air to the space.
 - The filter was observed to be good condition.
4. Total air exchanges exceed the minimum target of 4 air changes per hour in 7 of the 8 rooms inspected. The one room that was below 4 air changes per hour is a large volume space used for Motor Skills adjacent to the Library and measured at 3.9 air changes per hour.
5. The high-level observations of all other spaces indicated that the majority of the unit ventilators had supply air and ventilation air, but not exhaust air. Three exhaust fans serving classroom areas were observed non-functional.

Recommendations

1. For unit ventilators:
 - a. Continue to upgrade filters MERV 11 filters and inspect/replace regularly.
 - b. Make all units operational. Retro-commission DDC controls and sequences. Ensure fan speed setting is correct.
 - c. Rebalance to recommended ventilation rates, where possible.
 - d. Ensure all units and exhaust grilles are clear from desks and other objects for optimal ventilation effectiveness.
 - e. P.M. to include cleaning of units and coils.
 - f. Make all exhaust fans operational and rebalance.
2. For rooftop unit systems:
 - a. Upgrade filters to MERV 13 filters and inspect/replace regularly.
 - b. Investigate ability to upgrade units with additional mechanical ventilation and balance to recommended ventilation rates, where possible.
 - c. P.M. including cleaning of units including cooling coils, ensure condensate traps are functional, tighten fan belts and replace as needed.

Harrington Elementary School

1. 40 rooms inspected of which detailed inspection and analysis was completed for 8 rooms.
2. Of the 5 unit ventilators inspected, all were observed to be operational including controls. A false wall has been constructed for return and outside air. There is a lot of leakage around the walls, so the measurements taken are not a reliable to the true conditions.
 - Based on normal occupancy levels, 5 of the units were not delivering appropriate ventilation air to the space.
 - Based on reduced occupancy levels, 1 of the units was not delivering appropriate ventilation air to the space.
 - Filters were observed to be in good condition.
3. The “modular” classrooms are served from central rooftop equipment.
 - One classroom and rooftop unit was inspected. The system used ducted supply and the ceiling plenum for return air.
 - Based on normal occupancy levels, the unit was not delivering appropriate ventilation air to the space.
 - Based on reduced occupancy levels, the unit was delivering appropriate ventilation air to the space.
 - The filter was observed to be good condition.
4. Classroom 1A only contains fin-tube baseboard heat and does not contain ventilation or exhaust systems. The adjacent connecting restroom has exhaust.
5. Nurse room consists of a packaged through-wall type HVAC unit with ventilation air and but no exhaust system.
6. Total air exchanges exceed the minimum target of 4 air changes per hour in 3 of the 8 rooms inspected.
7. The high-level observations of all other spaces indicated that the vast majority of the unit ventilators had supply air, ventilation air, and exhaust air. Six exhaust fans serving the classroom areas were observed non-functional.

Recommendations

1. For unit ventilators:
 - a. Continue to upgrade filters MERV 11 filters and inspect/replace regularly.
 - b. Make all units operational. Retro-commission DDC controls and sequences. Ensure fan speed setting is correct.
 - c. Rebalance to recommended ventilation rates, where possible.
 - d. Ensure all units and exhaust grilles are clear from desks and other objects for optimal ventilation effectiveness.
 - e. P.M. to include cleaning of units and coils.
 - f. Make all exhaust fans operational and rebalance.
2. For rooftop unit systems:
 - a. Upgrade filters to MERV 13 filters and inspect/replace regularly.
 - b. Investigate ability to upgrades units with additional mechanical ventilation and balance to recommended ventilation rates, where possible.
 - c. P.M. including cleaning of units including cooling coils, ensure condensate traps are functional, tighten fan belts and replace as needed.
3. Consider HVAC upgrades in Reading C1 and Nurse Room (exhaust system).
4. As unit ventilators get replaced, the false wall condition should be remedied.

South Row Elementary School

1. 38 rooms inspected of which detailed inspection and analysis was completed for 7 rooms.
2. Of the 4 unit ventilators inspected, two units were observed to be operational and two non-operational. One operational unit had a non-functioning damper actuator.
 - Based on normal and reduced occupancy levels, 2 units were not delivering appropriate ventilation air to the space because they were not functioning.
 - Filters were observed to be in good condition.
 - It has since been determined that a programming update is needed to allow the fans to operate independently of space temperature setpoint.
3. The “modular” classrooms are served from central rooftop equipment and wall-mounted BARD units.
 - Two classrooms and HVAC units were inspected.
 - Based on normal occupancy levels, the units were not delivering appropriate ventilation air to the space.
 - Based on reduced occupancy levels, the rooftop unit was not delivering appropriate ventilation air to the space.
 - The rooftop unit filter was observed to be poor condition and the BARD unit did not have a filter.
4. Nurse room consists of a ductless split system with no ventilation air and very minimal exhaust in the restroom.
5. Total air exchanges exceed the minimum target of 4 air changes per hour in 4 of the 7 rooms inspected.
6. The high-level observations of all other spaces indicated that the vast majority of the unit ventilators were off with no supply air, ventilation air or exhaust air. Twelve (12) exhaust fans serving classroom areas were observed non-functional.

Recommendations

1. For unit ventilators:
 - a. Continue to upgrade filters MERV 11 filters and inspect/replace regularly.
 - b. Make all units operational. Retro-commission DDC controls and sequences. Ensure fan speed setting is correct.
 - c. Rebalance to recommended ventilation rates, where possible.
 - d. Ensure all units and exhaust grilles are clear from desks and other objects for optimal ventilation effectiveness.
 - e. P.M. to include cleaning of units and coils.
 - f. Make all exhaust fans operational and rebalance.
2. For rooftop unit systems:
 - a. Upgrade filters to MERV 13 filters and inspect/replace regularly.
 - b. Investigate ability to upgrades units with additional mechanical ventilation and balance to recommended ventilation rates, where possible.
 - c. P.M. including cleaning of units including cooling coils, ensure condensate traps are functional, tighten fan belts and replace as needed.
3. Investigate filter upgrade options for the BARD units.
4. Consider HVAC Nurse Room (exhaust system).

Community Education Building

1. 25 rooms inspected of which detailed inspection and analysis was completed for 6 rooms.
2. Of the 5 unit ventilators inspected, all were observed to be operational including controls. A false wall has been constructed for return and outside air. There is a lot of leakage around the walls, so the measurements taken are not a reliable to the true conditions.
 - Based on normal and reduced occupancy levels, all 5 units were delivering appropriate ventilation air to the space.
 - Filters were observed to be in good condition with one observed to be installed backwards.
3. The Health Office consists of only an exhaust system and no direct mechanical ventilation.
4. The Staff Room contains a typical unit ventilator and is open and interconnected to Room 135. Room 135 is an interior space with no heating or air conditioning but includes exhaust air systems.
5. Total air exchanges exceed the minimum target of 4 air changes per hour in 5 of the 6 rooms inspected.
6. The high-level observation of all the other spaces indicated that the vast majority of the unit ventilators had supply air, ventilation air, and exhaust air. Three exhaust fans serving classroom areas were observed non-functional.

Recommendations

1. For unit ventilators:
 - a. Continue to upgrade filters MERV 11 filters and inspect/replace regularly.
 - b. Make all units operational. Retro-commission DDC controls and sequences. Ensure fan speed setting is correct.
 - c. Rebalance to recommended ventilation rates, where possible.
 - d. Ensure all units and exhaust grilles are clear from desks and other objects for optimal ventilation effectiveness.
 - e. P.M. to include cleaning of units and coils.
 - f. Make all exhaust fans operational and rebalance.
2. As unit ventilators get replaced, the false wall condition should be remedied.
3. Consider HVAC upgrades in Health Room.



Limits of Assessment and Recommendations

Recommendations contained herein are based on sources deemed reliable, including the CDC and OSHA. CMTA make no guarantees, representations or warranties of any kind, expressed or implied, regarding the information, suggestions, or recommendations, including, but not limited to, warranties of content, accuracy and reliability. There is no guarantee that implementing these re-entry measures will decrease or eliminate the risks of spreading infectious disease and viruses. Each School District's plan for coming back to the school is at its own risk and must be tailored to its own discretion, criteria, values, tolerance of risk, and the needs of its staff, students and visitors. The various requirements for re-entry plans will be dictated by federal, state, city and/or local level governments and each School District will have to operate in compliance with applicable laws, codes, rules and regulations, and Board of Education requirements. Because requirements and guidelines are constantly changing, Districts must monitor developments including developments in scientific studies, and consult with its legal counsel and insurance advisors for advice based on its own specific circumstances regarding school re-entry plans.

III – Strategies



The ultimate goal of this effort is to improve the indoor air quality in your schools in order to reduce potential health risks associated with the reopening of your school buildings while keeping students and staff as safe as possible. Current guidance promotes that school systems assess and verify current building ventilation rates and based on those findings make all efforts to validate and increase ventilation levels in buildings both by volume of air and by increasing the hours that the system operates, as well as, adding or increasing filtration of the indoor air.

Increasing Outdoor Air Ventilation Rates

ASHRAE building reopening guidelines include a recommendation for increasing ventilation rates. Strategies for increasing classroom ventilation rates have been developed based on the current system types. As ventilation is increased the units heating and cooling capacity is affected. If ventilation is increased too far, the system will not be able to provide adequate cooling, heating, or dehumidification of the space. The ASHRAE guidelines advise increasing ventilation in the space as much as possible without compromising basic thermal comfort levels (ASHRAE Standard 55). The recommended space temperatures are 72 F (winter) and 75 F (summer) with a relative humidity range of 50% to 60% during summer air conditioning operations.

The intent of increased ventilation is to expel indoor air pollutants through an increased supply of fresh outdoor air.

The following five (5) ventilation strategies have been developed to address current HVAC types found in the typical classroom spaces – not all would apply to each school:

- Strategy #1 – Adjusting HVAC Control Sequences to Increased Ventilation Mode
- Strategy #2 – Adjusting CO2 Sensors to allow for Increased Ventilation
- Strategy #3 – Increasing Outdoor Air Intake
- Strategy #4 – Constant Use of Exhaust Systems
- Strategy #5 – For Buildings without Central HVAC systems – Open Windows

Strategy #1 – Adjusting HVAC Control Sequences to Increased Ventilation Mode

Increasing ventilation time could be accomplished by modifying the controls for the roof top units and unit ventilators. For buildings that are capable of incorporating an increase in ventilation timeframe, it would be recommended that a control sequence for “INCREASED VENTILATION MODE” be created to allow the central control system operator to easily activate and deactivate these modes of operation. A Building Flush with outside air ventilation provided from all units is recommended before and after occupancy. Steps include:

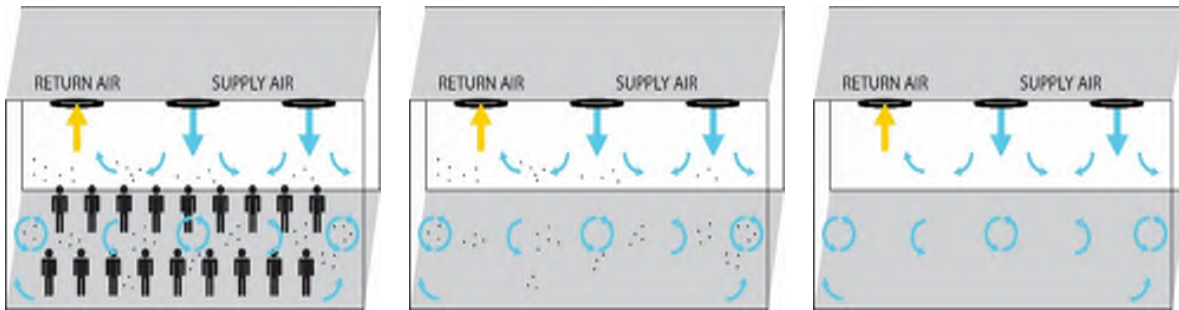
- “INCREASED VENTILATION MODE”- The building HVAC schedule shall be extended 2 hours before and after occupancy.
- Ventilation shall be provided during the increased time schedule.
- Exhaust fans shall be on.
- Unoccupied space temperatures shall remain on the optimal start schedule.

- Building with central A/C systems shall enter occupied setpoints 2 hours before in cooling mode to encourage increased airflow prior to occupancy.

If any system or equipment has limited capacity to support a Building Flush immediately before and after occupancy, as described above, the following steps are recommended:

- The building flush could occur at night when the outdoor air temperatures are typically cooler and allowing larger percentages of ventilation.
- Continue to operate the equipment with the “INCREASED VENTILATION MODE”- The cooling and economizing systems should be controlled and the unit outside air, return air and relief air dampers shall modulate to maximize the outside air while maintaining discharge air temperature setpoint of 55°F to 60°F (adj.).

The diagrams below depicts ventilating during occupied and unoccupied hours and represent a Building Flush to remove contaminants from indoor spaces by bringing in a high volume of fresh outdoor air and circulating it through the spaces.



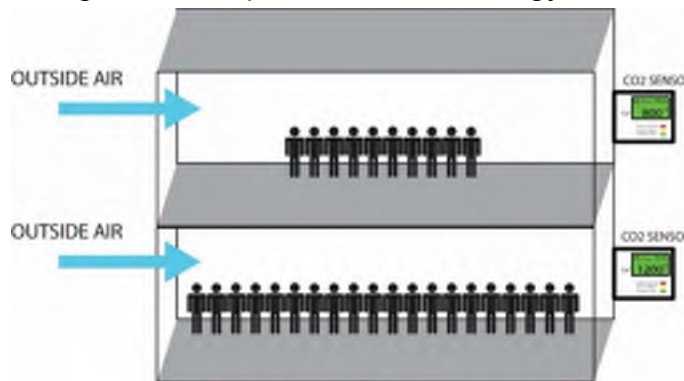
Pro's	Con's
<ul style="list-style-type: none"> ▪ Primary ASHRAE Recommendation. ▪ Included in Harvard Risk reduction strategies for reopening schools. ▪ Included in CDC recommendation to verify proper ventilation. ▪ Can utilize existing equipment. 	<ul style="list-style-type: none"> ▪ First costs associated with programming changes to the DDC system. ▪ The Building Flush is anticipated to add to the overall building energy costs. ▪ Minimal wear and tear will increase maintenance and reduce system life for the air handling systems, along with heating and cooling equipment. ▪ Limited capacity of the equipment to provide conditioning with a 100% outside air for flushing. Therefore, care must be taken to reduce the potential for increased space humidity which can cause IAQ issues (mold, sagging ceiling tile, condensation). ▪ Requires user intervention to control units for the extended hours or control scheduling for times when weather is permitting.

Strategy #2 – Adjusting CO2 Sensors to allow for Increased Ventilation

Some spaces and units may utilize demand control ventilation, where the ventilation system is controlled by space CO2 sensors intended to reduce ventilation and energy costs when spaces are not occupied or fewer people are in the area. To increase ventilation the demand control CO2 sensors should be turned off. The following steps are recommended:

- Ideally the CO2 setpoint in the spaces would be set to equal the outdoor air CO2 but with sensor calibration this may not be feasible.
- During “INCREASED VENTILATION MODE”- The space CO2 setpoint could be reset to a lower value (200 PPM or less than outdoor air CO2) which would basically require full ventilation airflow to the space.
- Systems with high levels of diversity: the system capacity will not allow the reduction to low PPM goals. Goal is to have the DOAS fan at 100% to achieve the largest number of air changes. If maintaining duct static and the fan is not 100% then increase airflow to zones with the highest CO2 levels until the fan capacity is maximized.

The figure below illustrates the operation of a CO2 sensor controlling ventilation rates. Common CO2 sensor settings that ensure indoor air does not exceed the code maximum of 1200 Parts per Million (PPM) still will not reduce CO2 levels to the common outdoor range of 400 to 450 PPM even when room occupancy is as low as 50%. For this reason, recommendations call for turning the sensors off since during the current crisis increased building air flow is prioritized over energy cost savings.

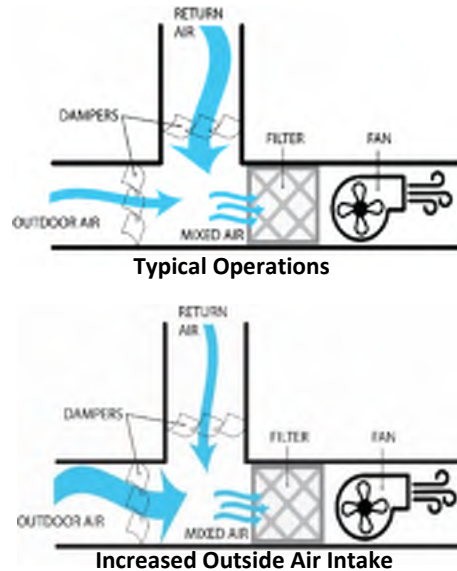


Pro's	Con's
<ul style="list-style-type: none"> ▪ ASHRAE recommended. ▪ Included in Harvard Risk reduction strategies for reopening schools. ▪ Can utilize existing equipment. 	<ul style="list-style-type: none"> ▪ First costs associated with programming changes to the DDC system. ▪ The building flush is anticipated to add to overall building energy costs. ▪ The ventilation system operating at full airflow constantly is anticipated to add to the overall building energy costs. ▪ Minimal wear and tear will increase maintenance and reduce system life for the air handling systems, along with heating and cooling equipment.

Strategy #3 – Increasing Outdoor Air Intake

Increased intake of outdoor air into the HVAC system can be utilized temporarily when coupled with reduced occupancy. Reducing the occupancy allows for additional ventilation per person, which allows for a reduced load on the cooling equipment. At this time ASHRAE recommends prioritizing increased outside air over concerns about indoor humidity, as long as the indoor air humidity can be maintained in the range of 40%-60%. Steps for this strategy include:

- “INCREASED VENTILATION MODE”- The cooling system should be controlled and the unit outside air, return air and relief air dampers shall modulate to maximize the outside air while maintaining a discharge air temperature setpoint of 55°F-60°F (adj.).
- Revise the economizer sequences to compare the outside air to the return air to enable economizer sooner and longer. Open the outside air damper to the maximum position that allows the unit to maintain discharge air temperature setpoint.
- Note when the outdoor air temperature is equal to or less than the return air temperature and the outdoor enthalpy is 27 BTU/lb or less than, the unit can enter economizer mode with minimal impact on system capacity.



Pro's	Con's
<ul style="list-style-type: none"> ▪ Can utilize existing equipment. ▪ Utilize economizer strategies sooner to increase ventilation. ▪ Preferred ASHRAE Recommendation. ▪ Included in the IWBI (International Well Building Institute) strategy for improved air quality. 	<ul style="list-style-type: none"> ▪ First costs associated with programming changes to the DDC system. ▪ Limited to the capacity of the cooling coil to provide increased ventilation and not introduce humid air into the building. ▪ Depending on the ability to implement, anticipate an increase in the overall building energy costs. ▪ Minimal wear and tear will increase maintenance and reduce system life for the air handling systems, along with heating and cooling equipment.

Strategy #4 – Constant Use of Exhaust Systems

Building exhaust systems are an integral part to the overall ventilation system. Many spaces in schools, such as restrooms and janitors’ closets, require exhaust. In response to COVID-19, it is recommended that exhaust fans be operated 24 hours a day or to the maximum extent possible to help flush air out of the building depending on outdoor conditions, etc. Exhaust fans controlled by local switches should be switched on to operate continuously. During these operations, humidity levels should be monitored. If excessive relative humidity levels result, outside the range of 50% to 60% during summer, then exhaust systems can be turned off until conditions improve or weather allows. Exhaust fans should operate in conjunction with the ventilation systems, on the same continuous schedule. Many fans need to be placed back into operation. This includes the systems in all classrooms, restrooms, janitors’ closets, and similar spaces.

Pro’s	Con’s
<ul style="list-style-type: none"> ▪ ASHRAE recommended ▪ Included in Harvard Risk reduction strategies for reopening schools ▪ Can utilize existing equipment 	<ul style="list-style-type: none"> ▪ Operating exhaust systems at full airflow constantly is anticipated to add to the overall building energy costs. ▪ Minimal wear and tear will increase maintenance and reduce system life for the exhaust systems.

Strategy #5 – For Buildings without Central HVAC systems – Open Windows

The guidelines for opening buildings include decisions trees for improving building ventilation to mitigate COVID-19 risks. If a building does not have adequate or centralized mechanical ventilation then opening windows and using window fans to promote airflow through the building are recommended.

Pro’s	Con’s
<ul style="list-style-type: none"> ▪ ASHRAE recommended. ▪ Included in Harvard Risk reduction strategies for reopening schools. ▪ Inexpensive. 	<ul style="list-style-type: none"> ▪ Weather and other outdoor implications. ▪ Heat and cold cannot be controlled while also increasing ventilation. ▪ Outdoor environment will come indoors.

Increasing Indoor Air Filtration

Indoor air filtration can reduce risk of viral transmission by removing particles from any air that is recirculated within a building.

The following two (2) filtration strategies have been developed to address current HVAC types found in the typical classroom spaces:

Strategy #1 – Increasing Centralized Air Filters

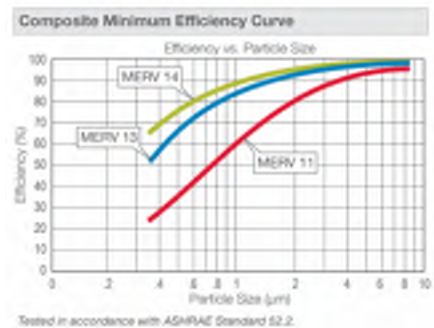
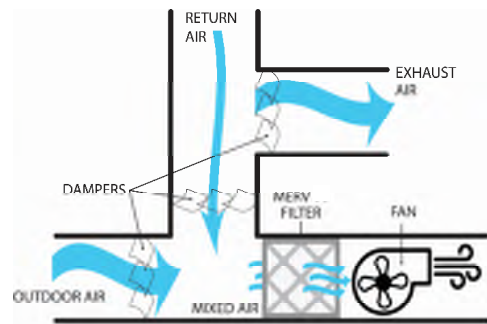
Strategy #2 – Spaces without Central HVAC systems – Portable HEPA Filters

MERV ratings, developed by ASHRAE, indicate the percentage of particles and the sizes of particles that filters can remove from air passing through them.

Strategy #1 – Increasing Centralized Air Filters

The target filtration level recommended for building central HVAC systems is MERV 13 or higher. MERV 13 filters are rated to capture 50 percent of small particles (0.3 to 1 micron), 85% of medium particles (1 to 3 microns), and 90 percent of large particles (3 to 10 microns).

The adjacent diagrams show typical filter arrangement and illustrates efficiency comparison of MERV filters. While the SAR2 virus is less than 0.3 microns, the virus is usually suspended in water droplets, which are of a larger size that can be captured by high efficiency filters. MERV 13 filters are readily available in 2-inch pleated media sizes. HVAC units commonly come with 2-inch or thicker filter banks that are capable of accommodating MERV 13 filters.



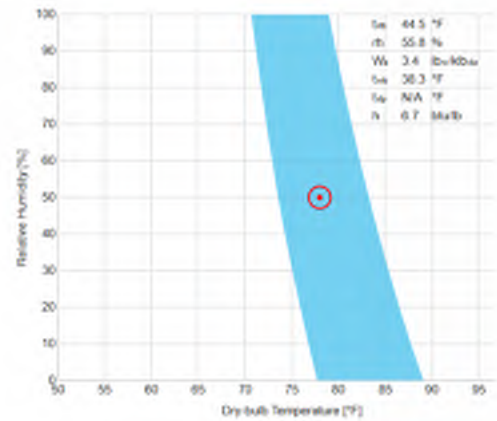
The clean pressure drop of a MERV 11, 2-inch pleated filter is approximately 0.2 inches of water column while the pressure drop of MERV 13, 2-inch pleated filter is approximately 0.3 inches of water column. Filters are recommended to be replaced at approximately 1-inch of static pressure. The main impact of upgrading to MERV 13 filters is that they start at a higher pressure drop and will achieve 1-inch of static pressure sooner; the MERV 13 filter is more efficient; therefore, it will collect more particles and reach the final (dirty) resistance sooner.

This strategy would require the following steps:

- Changing the filters in the central air handling units (AHUs) and rooftop units to a minimum of MERV 13 or highest MERV rated filter compatible with the existing filter rack and the seal edges of the filter, which limit air from bypassing the filter.
- Making sure the air handling systems and fans can overcome the additional pressure drop of the new filters and still maintain air flow at acceptable levels.

Increased filtration, higher MERV rated filters, can be used temporarily, or in some cases permanently when coupled with reduced occupancy, allowing the systems fans to operate at lower speeds to reduce strain on the system. The use of higher efficiency filtration needs to be reviewed, case by case, for each unit type. Every system has different operating characteristic and filter system designs that need to be investigated to determine the best method for increasing filtration while maintaining the fan systems.

Another potential issue with increased filtration is reduced airflow to rooms. School buildings are typically designed and maintained at a temperature range of 74F - 76F in the summer months. This is on the low end of ASHRAE thermal comfort recommendations and temperatures can be allowed to rise to 78F while still meeting thermal comfort parameters as shown in adjacent figure. See adjacent chart. This means that a higher room temperature might need to be considered acceptable in order to achieve the overall goal to increase the percentage of outside air to the air handling unit and better filter the return air prior to returning to the space.




Pro's	Con's
<ul style="list-style-type: none"> ▪ ASHRAE Recommended. ▪ Included in Harvard Risk reduction strategies for reopening schools. ▪ Air handling equipment is typically selected for 1" dirty filter pressure drop. Utilizing a MERV 13 with an initial pressure drop of 0.27" or MERV 14 at 0.31" can be utilized for many HVAC air handling units. 	<ul style="list-style-type: none"> ▪ Increased maintenance for filter replacement during an event due to better capture and increased pressure drop. ▪ Increase filter costs. ▪ Higher MERV rating filters, should anticipate a minor increase in overall building energy costs. ▪ Maintenance Procedures for changing to protect the person serving the equipment.

Strategy #2 – Spaces without Central HVAC systems – Portable HEPA Filters

If central system filtration is not possible in some buildings or spaces, which could be the case with unit ventilators or small unitary HVAC equipment serving individual spaces, then building filtration should be provided or supplemented with portable air cleaners which utilize HEPA filters. The units should operate continuously while also having periodic filter inspections and replacements.

Additionally, there are many resources to aide in the proper selection of this type of equipment. The Harvard T.H. Chan School of Public Health has developed a simple calculator tool for this purpose.

A sample calculation is as follows for a typical 800 sf classroom with 8’6” ceilings. A 500-cfm unit in this situation would provide 4.4 air changes per hour and would be classified as “Good”.

STEP 1 HOW BIG IS THE ROOM?			
Select units of preference	feet		
How big is your room?	800	Input your room size here in square feet	
How tall are your ceilings?	8.5	Input your room size here in feet	
STEP 2 WHAT IS THE 'CLEAN AIR DELIVERY RATE' OF THE AIR PURIFIER? (you get this from the manufacturer)			
What is the clean air delivery rate of the air purifier?	500	Find the CADR from the manufacturer in units of cubic feet per minute, or cfm; if they report	
STEP 3 HOW MUCH OUTDOOR AIR VENTILATION DO YOU HAVE?			
How is the ventilation in my school?	Typical school	Good ventilation	3 ACH This is the approxi
		Enhanced ventilation	4 ACH Select this only if yo
		Typical school	1.5 ACH This is an approxi
		Low ventilation	1 ACH Select this if your sc
STEP 4 COMBINING AIR CLEANING AND VENTILATION, IS YOUR ROOM MEETING THE TARGET?			
Air changes from outdoor air ventilation	0	TARGET IS AT LEAST 5 TOTAL AIR CHANGES PER HOUR 	
Air changes from air cleaner	4.4		
Total air changes in the room per hour	4.4		

Care should be exercised to select these units while also considering the noise implications. Additionally, the units should be located as centrally as possible in the space to provide optimal coverage while also avoiding blowing directly on individuals.

Pro's	Con's
<ul style="list-style-type: none"> Portable HEPA Efficiency. Efficiency is simply the percentage of particles that are removed by the filter. The Department of Energy (DOE) has a technical definition for HEPA that defines it as removing 99.97% (efficiency) of particles sized at 0.3 microns. ASHRAE Recommendation. Can be utilized in areas where central IAQ strategies are not available. 	<ul style="list-style-type: none"> Effectiveness based on space and location installed. Could be noisy. Increase filter costs. Increased energy costs. Potentially a limited resource to obtain.

Advanced Air Quality Improvement Systems

There are additional more advanced techniques for improving air quality that can be considered when the opportunity is available and the conditions are right. Installing air cleaning technologies such as bipolar ionization or ultraviolet light (UV-C) systems can be considered as supplementary measures when feasible. These air cleaning technologies have a similar effect in that they can potentially reduce the virus present in recirculating air.

Strategy #1 – Ultraviolet Light Systems

Ultraviolet germicidal irradiation (UVGI) systems using ultraviolet light have been shown to eliminate coronaviruses with the appropriate intensity and exposure time. Usually this technology is used in the supply air ducts to focus the technology on recirculating air and prevent the building occupants from being exposed to UV light. UV lights also reduce bacteria build up in the air handling equipment. However, to be effective there must be adequate exposure time between the virus and UV-C, which is challenging in a system with constantly moving air. It is impossible to ensure that UV-C lights in HVAC equipment are removing all of the hazards.



Strategy #2 – Needlepoint Bipolar Ionization Systems



There is a lot of discussion in the industry about bipolar ionization technology and ASHRAE has identified its possibility to improve indoor air quality. Recent studies suggest this technology can reduce coronavirus, with one manufacturer actually publishing test data which shows an impact on SARS-CoV2, the COVID-19 virus; however, there is no definitive recommendation for using bi-polar ionization specifically for COVID-19 at this time.

This is a good strategy for air-cleaning in schools with Unit Ventilators provided non-ozone generating type needlepoint units are installed.

Pro's	Con's
<ul style="list-style-type: none"> ▪ Improves indoor air quality. ▪ Can be utilized in areas where central IAQ strategies are not available. ▪ Can be used in systems where filtration options are limited. ▪ Some test result indicates effective at inactivating viruses located on surfaces. 	<ul style="list-style-type: none"> ▪ Effectiveness based on unit and space installed. ▪ Increase in first costs to install. ▪ Requires careful consideration in type to prevent creating Ozone in the space. ▪ Care must be taken with UV treatment to avoid harmful effects to people and equipment. ▪ Bipolar ionization has not been fully proven effective but is increasing in popularity.

IV – Ventilation Calculations

McCarthy MS - Ventilation Calculations

Room Name	Room Type	Az Floor Area (SF)	NORMAL Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Classroom 102	Classrooms (age 9 plus)	1,093	24	375	137	36.5%	456	2.9	73.7%	UV low speed
Classroom 105	Classrooms (age 9 plus)	819	24	340	49	14.4%	787	7.2	180.2%	
Classroom 109	Classrooms (age 9 plus)	713	24	330	641	194.2%	647	6.0	151.2%	
Classroom 115	Classrooms (age 9 plus)	926	24	355	276	77.7%	508	3.5	86.6%	UV med speed
Classroom 125	Classrooms (age 9 plus)	2,471	24	540	253	46.9%	1664	3.0	74.8%	UV med speed
Classroom 133	Classrooms (age 9 plus)	750	24	330	145	43.9%	755	7.1	177.6%	
Office	Office space	140	2	20	0	0.0%	0	0.0	0.0%	Ductless Split
Classroom 140	Classrooms (age 9 plus)	700	24	325	0	0.0%	0	0.0	0.0%	No UV
Pod 2	Classrooms (age 9 plus)	918	24	440	0	0.0%	1216	9.9	248.4%	No OA Hood
Classroom 205	Classrooms (age 9 plus)	740	24	330	58	17.6%	634	5.7	142.7%	UV med speed
Classroom 215	Classrooms (age 9 plus)	720	24	410	309	75.4%	924	10.3	256.7%	UV low speed
Classroom 220	Classrooms (age 9 plus)	660	24	320	654	204.4%	654	7.4	185.8%	
Classroom 222	Classrooms (age 9 plus)	740	24	330	627	190.0%	706	6.4	159.0%	
Classroom 230	Classrooms (age 9 plus)	910	24	350	42	12.0%	622	4.8	120.6%	UV low speed
Classroom 234	Classrooms (age 9 plus)	750	24	330	59	17.9%	830	7.8	195.3%	UV low speed

McCarthy MS - Ventilation Calculations

Room Name	Room Type	Az Floor Area (SF)	REDUCED Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Classroom 102	Classrooms (age 9 plus)	1093	8	215	137	63.7%	456	2.9	73.7%	UV low speed
Classroom 105	Classrooms (age 9 plus)	819	8	180	49	27.2%	787	7.2	180.2%	
Classroom 109	Classrooms (age 9 plus)	713	8	170	641	377.1%	647	6.0	151.2%	
Classroom 115	Classrooms (age 9 plus)	926	8	195	276	141.5%	508	3.5	86.6%	UV med speed
Classroom 125	Classrooms (age 9 plus)	2471	8	380	253	66.6%	1664	3.0	74.8%	UV med speed
Classroom 133	Classrooms (age 9 plus)	750	8	170	145	85.3%	755	7.1	177.6%	
Office	Office space	140	2	20	0	0.0%	0	0.0	0.0%	Ductless Split
Classroom 140	Classrooms (age 9 plus)	700	8	165	0	0.0%	0	0.0	0.0%	No UV
Pod 2	Classrooms (age 9 plus)	918	8	240	0	0.0%	1216	9.9	248.4%	No OA Hood
Classroom 205	Classrooms (age 9 plus)	740	8	170	58	34.1%	634	5.7	142.7%	UV med speed
Classroom 215	Classrooms (age 9 plus)	720	8	210	309	147.1%	924	10.3	256.7%	UV low speed
Classroom 220	Classrooms (age 9 plus)	660	8	160	654	408.8%	654	7.4	185.8%	
Classroom 222	Classrooms (age 9 plus)	740	8	170	627	368.8%	706	6.4	159.0%	
Classroom 230	Classrooms (age 9 plus)	910	8	190	42	22.1%	622	4.8	120.6%	UV low speed
Classroom 234	Classrooms (age 9 plus)	750	8	170	59	34.7%	830	7.8	195.3%	UV low speed

Parker MS - Ventilation Calculations

Room Name	Room Type	Az Floor Area (SF)	NORMAL Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Classroom 101	Classrooms (age 9 plus)	728	24	330	242	73.3%	354	3.1	76.8%	UV Low Speed
Classroom 104	Classrooms (age 9 plus)	784	24	335	333	99.4%	688	5.5	138.6%	UV Low Speed
Classroom 109	Classrooms (age 9 plus)	715	24	330	480	145.5%	775	6.8	171.1%	UV Low Speed
Classroom 119	Classrooms (age 9 plus)	700	24	325	481	148.0%	627	5.7	141.4%	UV Low Speed
Classroom 124	Classrooms (age 9 plus)	840	24	345	429	124.3%	782	5.9	147.0%	
Nurse	Office space	447	2	40	462	1155.0%	733	12.3	307.5%	
Classroom 202	Classrooms (age 9 plus)	783	24	335	502	149.9%	694	6.6	166.2%	
Workroom	Office space	384	2	35	0	0.0%	0	0.0	0.0%	Exhaust Only
Classroom 212 / IPAD	Classrooms (age 9 plus)	1,224	24	485	194	40.0%	1384	6.8	169.6%	Concealed Unit
Classroom 217	Classrooms (age 9 plus)	716	24	330	351	106.4%	552	4.9	121.8%	
Classroom 218	Classrooms (age 9 plus)	754	24	335	543	162.1%	851	7.1	178.2%	
Classroom 225	Classrooms (age 9 plus)	716	24	330	453	137.3%	711	6.3	156.9%	
Classroom 232	Classrooms (age 9 plus)	1,193	24	385	456	118.4%	954	5.1	126.3%	
Classroom 240	Classrooms (age 9 plus)	792	24	340	710	208.8%	1030	8.0	199.1%	
Portable #1	Classrooms (age 9 plus)	918	24	440	0	0.0%	1152	9.4	235.3%	No OA Hood
Portable #3	Classrooms (age 9 plus)	918	24	440	0	0.0%	1412	11.5	288.4%	No OA Hood

Parker MS - Ventilation Calculations

Room Name	Room Type	Az Floor Area (SF)	REDUCED Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Classroom 101	Classrooms (ages 5-8)	728	8	170	242	142.4%	354	3.1	76.8%	UV Low Speed
Classroom 104	Classrooms (ages 5-8)	784	8	175	333	190.3%	688	5.5	138.6%	UV Low Speed
Classroom 109	Classrooms (ages 5-8)	715	8	170	480	282.4%	775	6.8	171.1%	UV Low Speed
Classroom 119	Classrooms (ages 5-8)	700	8	165	481	291.5%	627	5.7	141.4%	UV Low Speed
Classroom 124	Classrooms (ages 5-8)	840	8	185	429	231.9%	782	5.9	147.0%	
Nurse	Office space	447	2	40	462	1155.0%	733	12.3	307.5%	
Classroom 202	Classrooms (ages 5-8)	783	8	175	502	286.9%	694	6.6	166.2%	
Workroom	Office space	384	2	35	0	0.0%	0	0.0	0.0%	Exhaust Only
Classroom 212 / IPAD	Classrooms (ages 5-8)	1224	8	285	194	68.1%	1384	6.8	169.6%	Concealed Unit
Classroom 217	Classrooms (ages 5-8)	716	8	170	351	206.5%	552	4.9	121.8%	
Classroom 218	Classrooms (ages 5-8)	754	8	175	543	310.3%	851	7.1	178.2%	
Classroom 225	Classrooms (ages 5-8)	716	8	170	453	266.5%	711	6.3	156.9%	
Classroom 232	Classrooms (ages 5-8)	1193	8	225	456	202.7%	954	5.1	126.3%	
Classroom 240	Classrooms (ages 5-8)	792	8	180	710	394.4%	1030	8.0	199.1%	
Portable #1	Classrooms (ages 5-8)	918	8	240	0	0.0%	1152	9.4	235.3%	No OA Hood
Portable #3	Classrooms (ages 5-8)	918	8	240	0	0.0%	1412	11.5	288.4%	No OA Hood

Byam ES - Ventilation Calculations

Room Name	Room Type	Az Floor Area (SF)	NORMAL Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Reading C1	Classrooms (ages 5-8)	450	12	175	0	0.0%	0	0.0	0.0%	Exhaust Only
Classroom 2	Classrooms (ages 5-8)	875	21	315	456	144.8%	684	4.9	123.5%	
Nurse	Office space	312	2	30	0	0.0%	458	9.3	231.8%	PTAC Unit
Classroom 8	Classrooms (ages 5-8)	1,360	21	375	466	124.3%	702	3.3	81.5%	
Classroom 15	Classrooms (ages 5-8)	901	21	320	465	145.3%	656	4.6	115.0%	
Classroom 16	Classrooms (ages 5-8)	901	21	320	410	128.1%	704	4.9	123.4%	
Classroom 21	Classrooms (ages 5-8)	884	21	320	368	115.0%	709	5.1	126.6%	
Portable #5	Classrooms (ages 5-8)	756	21	380	140	36.8%	586	5.8	145.3%	DX RTU

Room Name	Room Type	Az Floor Area (SF)	REDUCED Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Reading C1	Classrooms (ages 5-8)	450	6	115	0	0.0%	0	0.0	0.0%	Exhaust Only
Classroom 2	Classrooms (ages 5-8)	874.5	7	175	456	260.6%	684	4.9	123.5%	
Nurse	Office space	312	2	30	0	0.0%	458	9.3	231.8%	PTAC Unit
Classroom 8	Classrooms (ages 5-8)	1360	7	235	466	198.3%	702	3.3	81.5%	
Classroom 15	Classrooms (ages 5-8)	901	7	180	465	258.3%	656	4.6	115.0%	
Classroom 16	Classrooms (ages 5-8)	901	7	180	410	227.8%	704	4.9	123.4%	
Classroom 21	Classrooms (ages 5-8)	884	7	180	368	204.4%	709	5.1	126.6%	
Portable #5	Classrooms (ages 5-8)	756	7	205	140	68.3%	586	5.8	145.3%	DX RTU

Center ES - Ventilation Calculations

Room Name	Room Type	Az Floor Area (SF)	NORMAL Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Classroom 1	Classrooms (ages 5-8)	822	21	310	366	118.1%	958	7.8	194.2%	
Classroom 8	Classrooms (ages 5-8)	868	21	315	194	61.6%	887	6.8	170.3%	
Classroom 9	Classrooms (ages 5-8)	870	21	315	268	85.1%	853	6.5	163.4%	
Psych	Office space	225	2	25	69	276.0%	250	8.3	208.3%	
Motor Skills / Upper Library	Classrooms (ages 5-8)	1,107	21	430	461	107.2%	648	3.9	97.6%	
Nurse	Office space	358	2	35	303	865.7%	665	12.4	309.4%	
Classroom 23	Classrooms (ages 5-8)	841	21	315	295	93.7%	745	5.9	147.7%	
Portable #1	Classrooms (ages 5-8)	728	21	375	136	36.3%	719	7.4	185.2%	DX RTU

Room Name	Room Type	Az Floor Area (SF)	REDUCED Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Classroom 1	Classrooms (ages 5-8)	822	6	160	366	228.8%	958	7.8	194.2%	
Classroom 8	Classrooms (ages 5-8)	868	7	175	194	110.9%	887	6.8	170.3%	
Classroom 9	Classrooms (ages 5-8)	870	2	125	268	214.4%	853	6.5	163.4%	
Psych	Office space	225	7	50	69	138.0%	250	8.3	208.3%	
Motor Skills / Upper Library	Classrooms (ages 5-8)	1107	7	255	461	180.8%	648	3.9	97.6%	
Nurse	Office space	358	7	60	303	505.0%	665	12.4	309.4%	
Classroom 23	Classrooms (ages 5-8)	841	7	175	295	168.6%	745	5.9	147.7%	
Portable #1	Classrooms (ages 5-8)	728	7	200	136	68.0%	719	7.4	185.2%	DX RTU

Harrington ES - Ventilation Calculations

Room Name	Room Type	Az Floor Area (SF)	NORMAL Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Classroom 1A	Classrooms (ages 5-8)	468	12	175	0	0.0%	0	0.0	0.0%	Exhaust Only
Classroom 7	Classrooms (ages 5-8)	858	21	320	173	54.1%	451	3.5	87.6%	
Nurse	Office space	273	2	30	172	573.3%	454	11.1	277.2%	PTAC Unit
Classroom 8	Classrooms (ages 5-8)	1,400	21	380	350	92.1%	400	1.9	47.6%	
Classroom 11	Classrooms (ages 5-8)	884	21	320	270	84.4%	726	5.5	136.9%	
Classroom 19	Classrooms (ages 5-8)	875	21	315	219	69.5%	473	3.6	90.1%	
Classroom 23	Classrooms (ages 5-8)	884	21	320	264	82.5%	523	3.9	98.6%	
Portable #6	Classrooms (ages 5-8)	728	21	375	332	88.5%	603	6.2	155.3%	DX RTU

Room Name	Room Type	Az Floor Area (SF)	REDUCED Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Classroom 1A	Classrooms (ages 5-8)	468	6	120	0	0.0%	0	0.0	0.0%	Exhaust Only
Classroom 7	Classrooms (ages 5-8)	858	7	175	173	98.9%	451	3.5	87.6%	
Nurse	Office space	273	2	30	172	573.3%	454	11.1	277.2%	PTAC Unit
Classroom 8	Classrooms (ages 5-8)	1400	7	240	350	145.8%	400	1.9	47.6%	
Classroom 11	Classrooms (ages 5-8)	884	7	180	270	150.0%	726	5.5	136.9%	
Classroom 19	Classrooms (ages 5-8)	874.5	7	175	219	125.1%	473	3.6	90.1%	
Classroom 23	Classrooms (ages 5-8)	884	7	180	264	146.7%	523	3.9	98.6%	
Portable #6	Classrooms (ages 5-8)	728	7	200	332	166.0%	603	6.2	155.3%	DX RTU

South Row ES - Ventilation Calculations

Room Name	Room Type	Az Floor Area (SF)	NORMAL Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Classroom 104	Classrooms (ages 5-8)	898	21	320	0	0.0%	0	0.0	0.0%	UV Inoperable
Classroom 117	Classrooms (ages 5-8)	928	21	325	773	237.8%	837	6.0	150.3%	
Classroom 122	Classrooms (ages 5-8)	898	21	320	787	245.9%	838	5.9	147.4%	
Modular 2	Classrooms (ages 5-8)	822	21	390	318	81.5%	1558	12.6	316.1%	Bard Unit
Nurse	Office space	240	2	35	0	0.0%	0	0.0	0.0%	Ductless Split
Classroom 131	Classrooms (ages 5-8)	230	21	240	0	0.0%	0	0.0	0.0%	UV Inoperable
Portable #6	Classrooms (ages 5-8)	756	21	380	97	25.5%	662	6.6	164.2%	DX RTU

Room Name	Room Type	Az Floor Area (SF)	REDUCED Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Classroom 104	Classrooms (ages 5-8)	898	7	180	0	0.0%	0	0.0	0.0%	UV Inoperable
Classroom 117	Classrooms (ages 5-8)	928	7	185	773	417.8%	837	6.0	150.3%	
Classroom 122	Classrooms (ages 5-8)	898	7	180	787	437.2%	838	5.9	147.4%	
Modular 2	Classrooms (ages 5-8)	822	7	215	318	147.9%	1558	12.6	316.1%	Bard Unit
Nurse	Office space	240	2	35	0	0.0%	0	0.0	0.0%	Ductless Split
Classroom 131	Classrooms (ages 5-8)	230	7	100	0	0.0%	0	0.0	0.0%	UV Inoperable
Portable #6	Classrooms (ages 5-8)	756	7	205	97	47.3%	662	6.6	164.2%	DX RTU

Community Education Center - Ventilation Calculations

Room Name	Room Type	Az Floor Area (SF)	NORMAL Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Health Office	Office space	329	2	30	0	0.0%	0	0.0	0.0%	Exhaust Only
Staff Room & 135	Office space	472	2	45	390	866.7%	411	5.5	137.6%	
140 Room 9	Classrooms (ages 5-8)	901	21	320	412	128.8%	763	5.3	133.7%	
168 Room 2	Classrooms (ages 5-8)	1,056	21	340	445	130.9%	794	4.7	118.7%	
201 Room 20	Classrooms (ages 5-8)	702	21	295	708	240.0%	858	7.7	193.0%	RA Blocked
214 Room 11	Classrooms (ages 5-8)	923	21	325	580	178.5%	709	4.9	121.3%	

Room Name	Room Type	Az Floor Area (SF)	REDUCED Occupancy (Pz)	Code Minimum Ventilation Airflow (cfm)	Measured Ventilation Airflow (cfm)	% Above or Below Code Minimum	Measured Supply Airflow (cfm)	Supply Air Exchanges per Hour	% Above or Below 4 ACH	Comments
Health Office	Office space	329	2	30	0	0.0%	0	0.0	0.0%	Exhaust Only
Staff Room & 135	Office space	472	2	45	390	866.7%	411	5.5	137.6%	
140 Room 9	Classrooms (ages 5-8)	901	7	180	412	228.9%	763	5.3	133.7%	
168 Room 2	Classrooms (ages 5-8)	1056	7	200	445	222.5%	794	4.7	118.7%	
201 Room 20	Classrooms (ages 5-8)	702	7	155	708	456.8%	858	7.7	193.0%	RA Blocked
214 Room 11	Classrooms (ages 5-8)	923	7	185	580	313.5%	709	4.9	121.3%	

V – Field Reports & Photos

Date: 10/21/2020

Chelmsford Public Schools HVAC Assessment

Chelmsford High School

General Information

Address:	200 Richardson Road	Building Area:	285,882 sf
Original Year Built:	1974	Building Use:	9 thru 12
Building Additions:	2007	Student Capacity:	1407 students
Notes:			

HVAC Approach & Applicable Strategies

The goal of this effort is to improve the indoor air quality in the schools to reduce potential health risks associated with the reopening of school buildings and keep students and staff as safe as possible. Improving indoor air quality to reduce the spread of the virus and help maintain clean surfaces is a key strategy that can be incorporated into a layered defense against COVID-19 including social distancing, face coverings, cleaning & sanitation, etc.

Current guidance calls primarily for three risk mitigating actions related to HVAC systems:

- *Increase HVAC system outdoor air ventilation
- *Add or increase air filtration
- *Consider supplementing systems with air cleaning devices

Use Mechanical Ventilation	Yes, through UVs	Use MERV 13 filters:	No
Increase Ventilation	Yes, through UVs	Use Portable Filter Units:	Optional
Operate Exhaust Fans:	Yes	Open Windows:	Optional

Classroom Information

Number of Classrooms:	120	Normal Occupancy:	24
Typical Classroom Area(s):	700	Proposed Occupancy:	8
Typical Ceiling Height(s):	9.5	Operable Windows:	Yes
Notes:	Window Information: Double Pane		

Existing Classroom HVAC Information

		Filters:	
Heating System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: HW Boilers		
A/C System(s):	Terminal: N/A	Filter Type(s)/MERV	8
	Central: N/A		
Ventilation System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: N/A		
Air Distribution:	Ducted Exhaust in Classrooms	Energy Mgmt System:	Yes
Building Exhaust Systems:	Yes		
Notes:			

Date: 10/21/2020

Chelmsford High School

Evaluation of Basic HVAC System Operations

Room	Unit Ventilator Functional	Exhaust Air Functional	Notes
102	Yes (RTU)	Yes (RA)	Ducted
103	Yes (RTU)	Yes (RA)	Ducted
104	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
105	Yes (RTU)	Yes (RA)	Ducted
106	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
107	Yes (RTU)	Yes (RA)	Ducted, exhaust canopy abdn.
108	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
109	Yes (RTU)	Yes (RA)	
110	Yes (RTU)	Yes (RA)	5' fume hood
111	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
Lecture Hall #1	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
112	Yes (RTU)	Yes (RA)	Air purifier
113	Yes (RTU)	Yes (RA)	
114	Yes (RTU)	Yes (RA)	5' fume hood
115	Yes (RTU)	Yes (RA)	5' fume hood
116	Yes (RTU)	Yes (RA)	5' fume hood
117	Yes (RTU)	No (RA)	See Detailed Operation Notes
118	Yes (RTU)	Yes (RA)	5' fume hood
119	Yes (RTU)	Yes (RA)	5' fume hood
120	Yes (RTU)	Yes (RA)	5' fume hood
121	Yes (RTU)	Yes (RA)	5' fume hood
122	Yes (RTU)	Yes (RA)	5' fume hood
123	Yes (RTU)	Yes (RA)	5' fume hood
Boy's Locker Room	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
Athletic Area	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
201	Yes	No	
202	Yes	Yes	See Detailed Operation Notes
203	Yes	No	
204	Yes	No	
205	Yes	No	
206	Yes	No	
207	Yes	Yes	See Detailed Operation Notes
208	Yes	No	
209	Yes	No	
210	Yes	No	
211	Yes	No	See Detailed Operation Notes
212	Yes	No	
213	Yes	No	
214	Yes	No	
215	Yes	No	
216	No	Yes	

Date: 10/21/2020

Chelmsford High School			
Evaluation of Basic HVAC System Operations			
Room	Unit Ventilator Functional	Exhaust Air Functional	Notes
217	Yes (RTU)	Yes (RA)	Ducted system
218	Yes (RTU)	Yes (RA)	Ducted system
219	Yes (RTU)	Yes (RA)	Ducted system
220	Yes (RTU)	Yes (RA)	Ducted system
221	Yes (RTU)	Yes (RA)	Ducted system
222	Yes (RTU)	Yes (RA)	Ducted system
223	Yes	No	UV & ducted, air purifier
224	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
Career Center	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
226	N/A	No (RA)	Shared space w/ 225, air purifier
227	Yes (RTU)	Yes (RA)	Air purifier
228	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
225	Yes (RTU)	No (RA)	See Detailed Operation Notes
Health	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
230	Yes	No	
231	Yes	No	
232	Yes	Yes	See Detailed Operation Notes
233	Yes	No	
234	Yes	No	
235	Yes	No	
236	Yes	No	
237	Yes	No	
238	Yes	No	See Detailed Operation Notes
239	Yes	No	
240	Yes	No	
241	Yes	Yes	See Detailed Operation Notes
242	Yes	No	
243	Yes	No	
244	Yes	No	
245	Yes	Yes	
246	Yes	Yes	
253	Yes	Yes	Shared airflow with 251 & 252
254	Yes	Yes	See Detailed Operation Notes
255	Yes	No	See Detailed Operation Notes
301	Yes	No	
302	Yes	No	
303	Yes	No	
304	Yes	Yes	See Detailed Operation Notes
305	Yes	No	
306	Yes	No	
307	Yes	Yes	See Detailed Operation Notes

Date: 10/21/2020

Chelmsford High School

Evaluation of Basic HVAC System Operations

Room	Unit Ventilator Functional	Exhaust Air Functional	Notes
308	Yes	No	
309	Yes	No	
310	Yes	No	UV partially blocked
311	Yes	No	
312	Yes	No	
313	Yes	No	
314	No	Yes	See Detailed Operation Notes
315	Yes	No	
316	Yes	Yes	Ducted System
317	Yes	Yes	Ducted System
318	Yes	No	
319	Yes	No	
320	Yes	Yes	See Detailed Operation Notes
321	Yes	No	
322	Yes	No	
323	Yes	No	
324	Yes	Yes	See Detailed Operation Notes
325	Yes	No	
326	Yes	Yes	Ducted System, separating walls
327	Yes	Yes	Air purifier
Lecture Hall 3	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
328	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
329	No	Yes	Window ventilation
330	Yes	No	
331	Yes	Yes	See Detailed Operation Notes
332	Yes	No	
333	Yes	No	
334	Yes	No	
335	Yes	No	
336	Yes	No	
337	Yes	Yes	See Detailed Operation Notes
338	Yes	No	
339	Yes	No	
340	Yes	No	
341	Yes	Yes	See Detailed Operation Notes
342	Yes	No	
343	Yes	No	
344	Yes	No	
345	Yes	Yes	Ducted system
346	Yes	Yes	Ducted system

Date: 10/21/2020

Chelmsford High School						
Detailed HVAC System Operations						
Classroom	Supply Air Volume	Return Air Volume	Outside Air Volume	OA Damper & Control Valve Function	Filter Condition	Notes
104	879	0	106	N/A	Ok	RTU-17
106	864	0	104	N/A	Ok	RTU-17
108	642	0	0	N/A	N/A	RTU-15
111	1,010	722	56	N/A	N/A	RTU-22
Lecture Hall #1	1,786	1,115	760	N/A	N/A	RTU-3
117	740	0	302	N/A	N/A	RTU-8
Boy's Locker Room	416	0	1,282	N/A	N/A	RTU-10
Athletic Dir.	143	0	153	N/A	N/A	RTU-11
202	956	507	449	Both Operational	Ok	
207	595	378	217	Both Operational	Ok	
211	0	0	0	No Communication	Ok	Not Operational
224	1,061	0	102	RTU	Ok	RTU-9
Career Center	715	0	231	RTU	N/A	RTU-7, blocked supply
225	365	205	106	RTU	N/A	RTU-7, no window
228	328	0	118	RTU	N/A	RTU-7, no window, 2 hoods
Health	487	368	157	RTU	N/A	RTU-7, no window
232	853	578	275	Both Operational	Ok	
238	0	0	0	No Communication	Ok	Not Operational
241	956	633	323	Both Operational	Ok	
254	617	617	0	No Communication	N/A	Local EF, filter stuck in OA
255	879	172	275	Both Operational	Bad	
304	664	420	244	Both Operational	Ok	
307	899	598	301	Both Operational	Ok	
314	0	0	0	Both Operational	Ok	No airflow/motor
320	987	493	494	Both Operational	Ok	
324	554	198	356	Both Operational	Ok	Missing filter cover
Lecture Hall #3	967	867	115	Both Operational	N/A	
328	365	0	44	Both Operational	N/A	
331	571	354	217	RTU	Ok	RTU-6
338	871	531	340	RTU	Ok	RTU-6
341	924	579	346	Both Operational	Ok	Diff. Filters

Date: 10/21/2020

Chelmsford Public Schools Chelmsford High School



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6

Date: 10/21/2020

Chelmsford Public Schools Chelmsford High School



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6

Date: 10/29/2020

Chelmsford Public Schools HVAC Assessment

McCarthy Middle School

General Information

Address:	250 North Road	Building Area:	147,954 sf
Original Year Built:	1957	Building Use:	5 thru 8
Building Additions:	1962	Student Capacity:	771 students
Notes:			

HVAC Approach & Applicable Strategies

The goal of this effort is to improve the indoor air quality in the schools to reduce potential health risks associated with the reopening of school buildings and keep students and staff as safe as possible. Improving indoor air quality to reduce the spread of the virus and help maintain clean surfaces is a key strategy that can be incorporated into a layered defense against COVID-19 including social distancing, face coverings, cleaning & sanitation, etc.

Current guidance calls primarily for three risk mitigating actions related to HVAC systems:

- *Increase HVAC system outdoor air ventilation
- *Add or increase air filtration
- *Consider supplementing systems with air cleaning devices

Use Mechanical Ventilation	Yes, through UVs	Use MERV 13 filters:	No
Increase Ventilation	Yes, through UVs	Use Portable Filter Units:	Optional
Operate Exhaust Fans:	Yes	Open Windows:	Optional

Classroom Information

Number of Classrooms:	66	Normal Occupancy:	24
Typical Classroom Area(s):	800	Proposed Occupancy:	8
Typical Ceiling Height(s):	9	Operable Windows:	Yes
		Window Information:	Double Pane
Notes:			

Existing Classroom HVAC Information

		Filters:	
Heating System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: HW Boilers		
A/C System(s):	Terminal: N/A	Filter Type(s)/MERV	8
	Central: N/A		
Ventilation System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: N/A		
Air Distribution:	Ducted Exhaust in Classrooms	Energy Mgmt System:	Yes
Building Exhaust Systems:	Yes		
Notes:	17 EF's not operating		

McCarthy Middle School

Evaluation of Basic HVAC System Operations

Room	Unit Ventilator Functional	Exhaust Air Functional	Notes
101	No	No	UV won't operate unless turned on
102	Yes	Yes	See Detailed Operation Notes
103	Yes	No	
104	Yes	No	No exhaust seen
105	Yes	Yes	See Detailed Operation Notes
106	Yes	No	
107	Yes	No	
108	Yes	No	
109	Yes	Yes	See Detailed Operation Notes
110	Yes	Yes	
111	Yes	Yes	
112	Yes	Yes	
113	Yes	Yes	
114	Yes	Yes	
115	Yes	Yes	See Detailed Operation Notes
116	Yes	No	
117	Yes	No	AC unit
118	No	Yes	No UV, AC unit
119	No	Yes	No UV
120	No	No	
121	Yes	Yes	
122	Yes	No	Exhaust obstructed
124	Yes	Yes	2 UVs
125	Yes	Yes	See Detailed Operation Notes
126	Yes	No	No exhaust seen
127	Yes	No	No exhaust seen, 1 UV operating, 1 not operating
128	Yes	No	
130	Yes	No	
131	Yes	Yes	
132	Yes	No	
133	Yes	Yes	See Detailed Operation Notes
134	Yes	No	
135	Yes	No	Exhaust obstructed
170 Library	Yes (RTU)	Yes (RA)	Ducted system
Office	N/A	Yes	See Detailed Operation Notes
140	N/A	N/A	See Detailed Operation Notes
141	N/A	Yes	
146	N/A	No	No UV

Date: 10/29/2020

McCarthy Middle School

Evaluation of Basic HVAC System Operations

Room	Unit Ventilator Functional	Exhaust Air Functional	Notes
Pod 1	Yes (RTU)	Yes (RA)	Ducted supply w/ plenum return
Pod 2	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
Pod 3	Yes (RTU)	Yes (RA)	Ducted supply w/ plenum return
Pod 4	Yes (RTU)	Yes (RA)	Ducted supply w/ plenum return
200	Yes	Yes	
201	Yes	Yes	
202	Yes	Yes	
203	Yes	Yes	Remove obstructions
204	Yes	Yes	Remove obstructions
205	Yes	Yes	See Detailed Operation Notes
206	Yes	No	
207	Yes	Yes	
208	Yes	Yes	
209	Yes	Yes	
210	Yes	Yes	Remove obstructions
211	No	Yes	Heat only, no flow
212	Yes	Yes	
213	Yes	Yes	
214	No	Yes	
215	Yes	Yes	See Detailed Operation Notes
216	No	No	Not operating during check
217	Yes	Yes	
218	Yes	Yes	
219	Yes	Yes	
220	Yes	Yes	See Detailed Operation Notes
221	Yes	Yes	
222	Yes	Yes	See Detailed Operation Notes
223	Yes	Yes	
224	Yes	No	
230	Yes	Yes	See Detailed Operation Notes
231	Yes	No	
232	Yes	No	
233	Yes	No	
234	Yes	Yes	See Detailed Operation Notes
235	Yes	No	

Date: 10/29/2020

McCarthy Middle School

Detailed HVAC System Operations

Classroom	Supply Air Volume	Return Air Volume	Outside Air Volume	Damper & Control Valve Function	Filter Condition	Notes
102	456	316	137	No communication	Fair	OA fails closed, RA fails open
105	787	738	49	No communication	Ok	OA fails closed, RA fails open
109	647	33	641	No communication	Fair	OA fails closed, RA fails open
115	508	233	276	No communication	Ok	OA fails closed, RA fails open
125	1,664	1,411	253	No communication	Ok	OA fails closed, RA fails open
133	775	610	145	No communication	Ok	OA fails closed, RA fails open
Office	0	0	0	N/A	N/A	Exhaust only
140	0	0	0	N/A	N/A	No supply or exhaust
Pod 2	1,216	1,216	0	N/A	Ok	RTU
205	634	576	58	No communication	Fair	OA fails closed, RA fails open
215	924	612	309	No communication	Bad	OA fails closed, RA fails open
220	654	0	654	No communication	Fair	OA fails closed, RA fails open
222	706	79	627	No communication	Fair	OA fails closed, RA fails open
230	662	580	42	No communication	Ok	OA fails closed, RA fails open
234	830	771	59	No communication	Ok	OA fails closed, RA fails open

Note: Damper actuators would modulate only upon reset of power. All OA dampers set to 10% per BAS.
 Building is negatively pressurized.

Date: 10/29/2020

Chelmsford Public Schools McCarthy Middle School

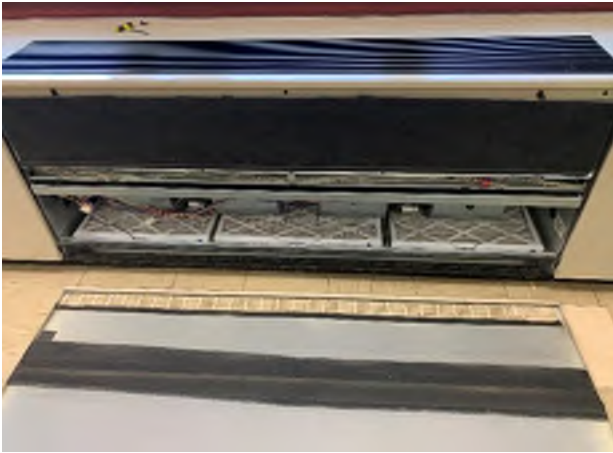


Photo 1



Photo 2



Photo 3

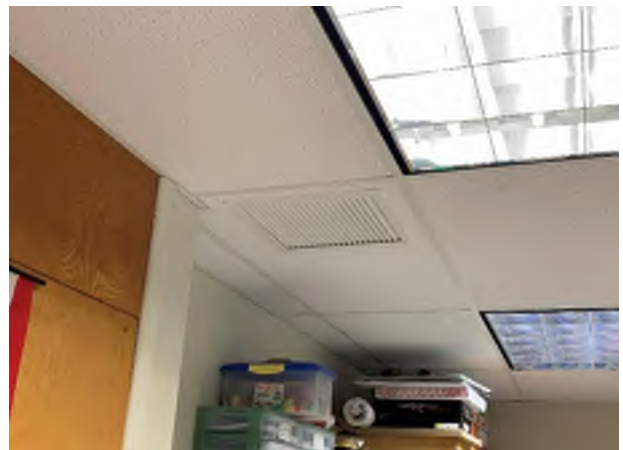


Photo 4

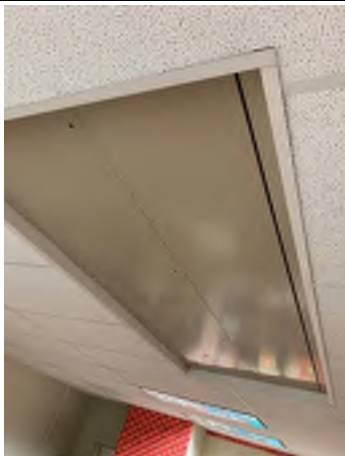


Photo 5



Photo 6

Date: 10/20/2020

Chelmsford Public Schools HVAC Assessment

Parker Middle School

General Information

Address:	75 Graniteville Road	Building Area:	150,400 sf
Original Year Built:	1965	Building Use:	5 thru 8
Building Additions:		Student Capacity:	727 students
Notes:			

HVAC Approach & Applicable Strategies

The goal of this effort is to improve the indoor air quality in the schools to reduce potential health risks associated with the reopening of school buildings and keep students and staff as safe as possible. Improving indoor air quality to reduce the spread of the virus and help maintain clean surfaces is a key strategy that can be incorporated into a layered defense against COVID-19 including social distancing, face coverings, cleaning & sanitation, etc.

Current guidance calls primarily for three risk mitigating actions related to HVAC systems:

- *Increase HVAC system outdoor air ventilation
- *Add or increase air filtration
- *Consider supplementing systems with air cleaning devices

Use Mechanical Ventilation	Yes, through UVs	Use MERV 13 filters:	No
Increase Ventilation	Yes, through UVs	Use Portable Filter Units:	Optional
Operate Exhaust Fans:	Yes	Open Windows:	Optional

Classroom Information

Number of Classrooms:	59	Normal Occupancy:	24
Typical Classroom Area(s):	750	Proposed Occupancy:	8
Typical Ceiling Height(s):	9.5	Operable Windows:	Yes
		Window Information:	Double Pane
Notes:			

Existing Classroom HVAC Information

		Filters:	
Heating System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: HW Boilers		
A/C System(s):	Terminal: N/A	Filter Type(s)/MERV	8
	Central: N/A		
Ventilation System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: N/A		
Air Distribution:	Ducted Exhaust in Classrooms	Energy Mgmt System:	Yes
Building Exhaust Systems:	Yes		
Notes:			



Date: 10/20/2020

Parker Middle School

Evaluation of Basic HVAC System Operations

Room	Unit Ventilator Functional	Exhaust Air Functional	Notes
101	Yes	Yes	See Detailed Operation Notes
102	Yes	Yes	Exhaust partially obstructed
103	Yes	Yes	UV obstructed
104	Yes	Yes	See Detailed Operation Notes
106	No	No	Portable air purifier
107	Yes	Yes	UV obstructed, no students
108	Yes	Yes	UV partially obstructed
109	Yes	Yes	See Detailed Operation Notes
110	Yes	Yes	UV & Exhaust obstructed
116	Yes	Yes	
117	Yes	Yes	
118	Yes	Yes	
119	Yes	Yes	See Detailed Operation Notes
122	Yes	Yes	Exhaust obstructed
123	Yes	Yes	
124	Yes	Yes	See Detailed Operation Notes
125	Yes	Yes	
200	Yes	Yes	See Detailed Operation Notes
201	Yes	Yes	
202	Yes	Yes	See Detailed Operation Notes
203	Yes	Yes	
204	Yes	Yes	
206	Yes	Yes	
207	Yes	Yes	
208	Yes	Yes	
209	Yes	Yes	
210	Yes	Yes	
Workroom	No	No	See Detailed Operation Notes
212	Yes	Yes	See Detailed Operation Notes
213	Yes (RTU)	Yes (RA)	Ducted system
214 Library	Yes (RTU)	Yes (RA)	Ducted system
216	Yes	Yes	UV often covered by teacher
217	Yes	Yes	See Detailed Operation Notes
218	Yes	Yes	See Detailed Operation Notes
219	Yes	Yes	
220	Yes	Yes	
221	N/A	N/A	
222	Yes	Yes	
223	Yes	Yes	
224	Yes	Yes	
225	Yes	Yes	See Detailed Operation Notes

Date: 10/20/2020

Parker Middle School						
Detailed HVAC System Operations						
Classroom	Supply Air Volume	Return Air Volume	Outside Air Volume	Damper & Control Valve Function	Filter Condition	Notes
101	354	112	242	Both Ok	Fair	
104	688	356	333	Both Ok	Fair	
109	775	295	480	Both Ok	Fair	CV worked after reset
119	627	295	481	Both Ok	Fair	
124	782	353	429	Both Ok	Poor	
Nurse	733	271	462	Both Ok	Ok	
202	694	192	502	Both Ok	Fair	
W. R.	0	0	0	N/A	N/A	Fintube heat & EF
212	1,384	1,190	194	Not operational	Not Accessible	Concealed UV
217	552	201	351	Both Ok	Fair	
218	851	308	543	Both Ok	Ok	
225	771	258	453	Both Ok	Ok	
232	954	498	456	Both Ok	Fair	
240	1,030	320	710	Both Ok	Fair	
PC1	1,152	1,152	0	N/A	Ok	RTU heat pump
PC3	1,412	1,412	0	N/A	Ok	RTU heat pump

Date: 10/20/2020

Chelmsford Public Schools Parker Middle School



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6

Date: 10/20/2020

Chelmsford Public Schools HVAC Assessment

Byam Elementary School

General Information

Address:	25 Maple Road	Building Area:	60,441 sf
Original Year Built:	1970	Building Use:	K thru 5
Building Additions:		Student Capacity:	454 students
Notes:			

HVAC Approach & Applicable Strategies

The goal of this effort is to improve the indoor air quality in the schools to reduce potential health risks associated with the reopening of school buildings and keep students and staff as safe as possible. Improving indoor air quality to reduce the spread of the virus and help maintain clean surfaces is a key strategy that can be incorporated into a layered defense against COVID-19 including social distancing, face coverings, cleaning & sanitation, etc.

Current guidance calls primarily for three risk mitigating actions related to HVAC systems:

- *Increase HVAC system outdoor air ventilation
- *Add or increase air filtration
- *Consider supplementing systems with air cleaning devices

Use Mechanical Ventilation	Yes, through UVs	Use MERV 13 filters:	No
Increase Ventilation	Yes, through UVs	Use Portable Filter Units:	Optional
Operate Exhaust Fans:	Yes	Open Windows:	Optional

Classroom Information

Number of Classrooms:	33	Normal Occupancy:	21
Typical Classroom Area(s):	900	Proposed Occupancy:	7
Typical Ceiling Height(s):	9.5	Operable Windows:	Yes
		Window Information:	Double Pane
Notes:			

Existing Classroom HVAC Information

		Filters:	
Heating System(s):	Terminal: Unit Ventilators Central: HW Boilers	Filter Type(s)/MERV	8
A/C System(s):	Terminal: N/A Central: N/A	Filter Type(s)/MERV	8
Ventilation System(s):	Terminal: Unit Ventilators Central: N/A	Filter Type(s)/MERV	8
Air Distribution:	Ducted Exhaust in Classrooms	Energy Mgmt System:	Yes
Building Exhaust Systems:	Yes		
Notes:	8 EF's not operating		

Date: 10/20/2020

Byam Elementary School

Evaluation of Basic HVAC System Operations

Room	Unit Ventilator Functional	Exhaust Air Functional	Notes
Reading C1	N/A	Yes	See Detailed Operation Notes
1	Yes	Yes	
2	Yes	Yes	See Detailed Operation Notes
3	Yes	No	
4	Yes	Yes	
5	Yes	No	
6	Yes	Yes	Partially obstructed exhaust
7	Yes	Yes	
Nurse	Yes (PTAC)	No	See Detailed Operation Notes
Room S1	Yes	Yes	
8	Yes	Yes	See Detailed Operation Notes
Room C5		No	
9	Yes	Yes	
Room S3	Yes	Yes	
Library	Yes	N/A	Exhaust not seen
SPED	Yes	Yes	
11	Yes	Yes	
12	Yes	Yes	Exhaust obstructed
13	Yes	No	
14	Yes	Yes	
15	Yes	Yes	See Detailed Operation Notes
16	Yes	Yes	See Detailed Operation Notes
17	Yes	Yes	Classroom not in use?
18	Yes	No	Exhaust obstructed
19	Yes	Yes	
20	Yes	Yes	
21	Yes	Yes	See Detailed Operation Notes
22	Yes	Yes	
23	Yes	Yes	
24	Yes	Yes	AC unit
25	Yes	Yes	AC unit
26	Yes	Yes	
27	Yes	Yes	
Speech S5	Yes	Yes	Exhaust obstructed
Portable 1	Yes (RTU)	Yes (RA)	Ducted Supply w/ plenum return
Portable 2	Yes (RTU)	Yes (RA)	Ducted Supply w/ plenum return
Portable 3	Yes (RTU)	Yes (RA)	Ducted Supply w/ plenum return
Portable 4	Yes (RTU)	Yes (RA)	Ducted Supply w/ plenum return
Portable 5	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
Portable 6	Yes (RTU)	Yes (RA)	Ducted Supply w/ plenum return

Date: 10/20/2020

Byam Elementary School

Detailed HVAC System Operations

Classroom	Supply Air Volume	Return Air Volume	Outside Air Volume	Damper & Control Valve Function	Filter Condition	Notes
Reading C1	0	0	0	N/A	N/A	EA in storage
2	684	0	456	Both Ok	Fair	
Nurse	458	162	0	N/A	Fair	PTAC, no EA
8	702	0	466	Both Ok	Fair	
15	656	94	465	Not Operational	Ok	
16	704	87	410	Both Ok	Ok	
21	709	151	368	Both Ok	Ok	
Portable 5	586	446	140	RTU	Ok	DX RTU elec. heat

Note: For rooms with unit ventilators, a plenum wall cavity has been constructed for return and outside air. There is a lot of leakage around the walls, so the RA & OA readings are not as reliable to the true conditions.

Date: 10/20/2020

Chelmsford Public Schools Byam Elementary School



Photo 1



Photo 2



Photo 3



Photo 4

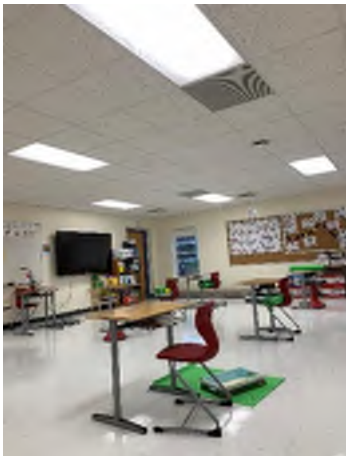


Photo 5



Photo 6

Date: 10/19/2020

Chelmsford Public Schools HVAC Assessment

Center Elementary School

General Information

Address:	84 Billerica Road	Building Area:	55,582 sf
Original Year Built:	1960	Building Use:	K thru 5
Building Additions:	1999	Student Capacity:	476 students
Notes:			

HVAC Approach & Applicable Strategies

The goal of this effort is to improve the indoor air quality in the schools to reduce potential health risks associated with the reopening of school buildings and keep students and staff as safe as possible. Improving indoor air quality to reduce the spread of the virus and help maintain clean surfaces is a key strategy that can be incorporated into a layered defense against COVID-19 including social distancing, face coverings, cleaning & sanitation, etc.

Current guidance calls primarily for three risk mitigating actions related to HVAC systems:

- *Increase HVAC system outdoor air ventilation
- *Add or increase air filtration
- *Consider supplementing systems with air cleaning devices

Use Mechanical Ventilation	Yes, through UVs	Use MERV 13 filters:	No
Increase Ventilation	Yes, through UVs	Use Portable Filter Units:	Optional
Operate Exhaust Fans:	Yes	Open Windows:	Optional

Classroom Information

Number of Classrooms:	29	Normal Occupancy:	21
Typical Classroom Area(s):	850	Proposed Occupancy:	7
Typical Ceiling Height(s):	9	Operable Windows:	Yes
		Window Information:	Double Pane
Notes:			

Existing Classroom HVAC Information

		Filters:	
Heating System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: HW Boilers		
A/C System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: A/C Chiller		
Ventilation System(s):	Terminal: N/A	Filter Type(s)/MERV	8
	Central: Unit Ventilator		
Air Distribution:	Ducted Exhaust in Classrooms	Energy Mgmt System:	Yes
Building Exhaust Systems:	Yes		
Notes:	3 EF's not operating		

Date: 10/19/2020

Center Elementary School

Evaluation of Basic HVAC System Operations

Room	Unit Ventilator Functional	Exhaust Air Functional	Notes
1	Yes	Yes	See Detailed Operation Notes
2	Yes	Yes	
3	No	Yes	Not operating
4	Yes	Yes	
5	Yes	No	
6	Yes	No	UV partially obstructed
7	Yes	No	
8	Yes	Yes	See Detailed Operation Notes
9	Yes	Yes	See Detailed Operation Notes
10	Yes	Yes	UV partially obstructed
11	Yes	Yes	
Speech	Yes	No	
SPED	Yes	Yes	
SPED	Yes	Yes	
Psych	Yes	Yes	See Detailed Operation Notes
13	Yes	Yes	
15	Yes	Yes	
15A	Yes	Yes	
Library	Yes	Yes	
Upper Library/Motor Skills	Yes	N/A	See Detailed Operation Notes
Nurse	Yes	N/A	See Detailed Operation Notes
17	Yes	No	
19	Yes	No	
20	Yes	No	
21	Yes	Yes	
23	Yes	Yes	See Detailed Operation Notes
24	Yes	No	
25	Yes	No	
26	Yes	No	
27	Yes	No	
Portable #1	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
Portable #2	Yes (RTU)	Yes (RA)	
Portable #3	Yes (RTU)	Yes (RA)	
Portable #4	Yes (RTU)	Yes (RA)	

Date: 10/19/2020

Center Elementary School

Detailed HVAC System Operations

Classroom	Supply Air Volume	Return Air Volume	Outside Air Volume	Damper & Control Valve Function	Filter Condition	Notes
1	958	592	366	No C.V., Damper ok	Ok	
8	887	693	194	No C.V., Damper ok	Ok	
9	853	585	268	No C.V., Damper ok	Ok	
Psych	397	259	69	No C.V., Damper ok	Ok	Ceiling UV
Upper Library/Motor Skills	648	187	461	No C.V., Damper ok	Ok	No EA
Nurse	665	362	303	No C.V., Damper ok	Fair	No EA
Portable #1	719	583	136	N/A	Ok	RTU Heat Pump
23	745	450	295	No C.V., Damper ok		

Date: 10/19/2020

Chelmsford Public Schools Center Elementary School



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6

Date: 10/19/2020

Chelmsford Public Schools HVAC Assessment

Harrington Elementary School

General Information

Address:	120 Richardson Road	Building Area:	60,441 sf
Original Year Built:	1968	Building Use:	K thru 5
Building Additions:		Student Capacity:	491 students
Notes:			

HVAC Approach & Applicable Strategies

The goal of this effort is to improve the indoor air quality in the schools to reduce potential health risks associated with the reopening of school buildings and keep students and staff as safe as possible. Improving indoor air quality to reduce the spread of the virus and help maintain clean surfaces is a key strategy that can be incorporated into a layered defense against COVID-19 including social distancing, face coverings, cleaning & sanitation, etc.

Current guidance calls primarily for three risk mitigating actions related to HVAC systems:

- *Increase HVAC system outdoor air ventilation
- *Add or increase air filtration
- *Consider supplementing systems with air cleaning devices

Use Mechanical Ventilation	Yes, through UVs	Use MERV 13 filters:	No
Increase Ventilation	Yes, through UVs	Use Portable Filter Units:	Optional
Operate Exhaust Fans:	Yes	Open Windows:	Optional

Classroom Information

Number of Classrooms:	33	Normal Occupancy:	21
Typical Classroom Area(s):	850	Proposed Occupancy:	7
Typical Ceiling Height(s):	9	Operable Windows:	Yes
Notes:	Window Information:		

Existing Classroom HVAC Information

		Filters:	
Heating System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: HW Boilers		
A/C System(s):	Terminal: N/A	Filter Type(s)/MERV	8
	Central: N/A		
Ventilation System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: N/A		
Air Distribution:	Ducted Exhaust in Classrooms	Energy Mgmt System:	Yes
Building Exhaust Systems:	Yes		
Notes:	6 EF's not operating		

Date: 10/19/2020

Harrington Elementary School

Evaluation of Basic HVAC System Operations

Room	Unit Ventilator Functional	Exhaust Air Functional	Notes
1	Yes	Yes	Return partially obstructed
1A	No	No	See Detailed Operation Notes
2	Yes	Yes	
3	Yes	Yes	
4	Yes	Yes	Return partially obstructed
5	Yes	Yes	Return partially obstructed
6	Yes	Yes	Return partially obstructed
7	Yes	Yes	See Detailed Operation Notes
Nurse	Yes	Yes	See Detailed Operation Notes
8	Yes	Yes	See Detailed Operation Notes
8A	Yes	Yes	Exhaust partially obstructed
8B	Yes	Yes	
9	Yes	No	Return partially obstructed
9A	Yes	Yes	Exhaust obstructed
Library	Yes	N/A	Exhaust not seen
10	Yes	Yes	Return partially obstructed
11	Yes	Yes	See Detailed Operation Notes
11A	Yes	Yes	Exhaust partially obstructed
12	Yes	No	
13	Yes	Yes	
14	Yes	Yes	Return obstructed
15	Yes	Yes	Return partially obstructed
16	Yes	Yes	Return partially obstructed
17	Yes	Yes	Return partially obstructed
18	Yes	Yes	Return partially obstructed
19	Yes	Yes	See Detailed Operation Notes
20	Yes	Yes	
21	Yes	Yes	
22	Yes	Yes	Return partially obstructed
23	Yes	Yes	See Detailed Operation Notes
24	Yes	Yes	Supply partially obstructed
25	No	Yes	
26	No	Yes	
27	Yes	Yes	Exhaust partially obstructed
Portable #1	Yes (RTU)	Yes (RA)	
Portable #2	Yes (RTU)	Yes (RA)	
Portable #3	Yes (RTU)	Yes (RA)	
Portable #4	Yes (RTU)	Yes (RA)	
Portable #5	Yes (RTU)	Yes (RA)	
Portable #6	Yes (RTU)	Yes (RA)	See Detailed Operation Notes

Date: 10/19/2020

Harrington Elementary School

Detailed HVAC System Operations

Classroom	Supply Air Volume	Return Air Volume	Outside Air Volume	Damper & Control Valve Function	Filter Condition	Notes
1A	0	0	0	N/A	N/A	Fintube Only
7	451	49	173	Both Ok	Good	
Nurse	454	282	172	N/A	Good	PTAC
8	400	64	350	Both Ok	Good	
11	726	88	270	Both Ok	Good	
19	473	0	219	Both Ok	Good	
23	523	0	264	Both Ok	Good	
Portable #6	603	271	332	Both Ok	Good	

Note: For rooms with unit ventilators, a plenum wall cavity has been constructed for return and outside air. There is a lot of leakage around the walls, so the RA & OA readings are not as reliable to the true conditions.

Date: 10/19/2020

Chelmsford Public Schools Harrington Elementary School



Photo 1



Photo 2

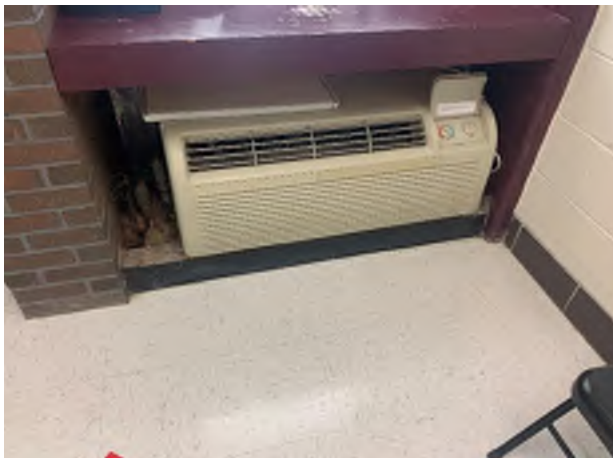


Photo 3



Photo 4



Photo 5



Photo 6

Date: 10/20/2020

Chelmsford Public Schools HVAC Assessment

South Row Elementary School

General Information

Address:	250 Boston Road	Building Area:	42,500 sf
Original Year Built:	1968	Building Use:	K thru 5
Building Additions:		Student Capacity:	419 students
Notes:			

HVAC Approach & Applicable Strategies

The goal of this effort is to improve the indoor air quality in the schools to reduce potential health risks associated with the reopening of school buildings and keep students and staff as safe as possible. Improving indoor air quality to reduce the spread of the virus and help maintain clean surfaces is a key strategy that can be incorporated into a layered defense against COVID-19 including social distancing, face coverings, cleaning & sanitation, etc.

Current guidance calls primarily for three risk mitigating actions related to HVAC systems:

- *Increase HVAC system outdoor air ventilation
- *Add or increase air filtration
- *Consider supplementing systems with air cleaning devices

Use Mechanical Ventilation	Yes, through UVs	Use MERV 13 filters:	No
Increase Ventilation	Yes, through UVs	Use Portable Filter Units:	Optional
Operate Exhaust Fans:	Yes	Open Windows:	Optional

Classroom Information

Number of Classrooms:	32	Normal Occupancy:	21
Typical Classroom Area(s):	900	Proposed Occupancy:	7
Typical Ceiling Height(s):	9.5	Operable Windows:	Yes
		Window Information:	Double pane
Notes:			

Existing Classroom HVAC Information

		Filters:	
Heating System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: Steam Boilers		
A/C System(s):	Terminal: N/A	Filter Type(s)/MERV	8
	Central: N/A		
Ventilation System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: N/A		
Air Distribution:	Ducted Exhaust in Classrooms	Energy Mgmt System:	Yes
Building Exhaust Systems:	Yes		
Notes:	12/14 Exhaust fans were off.		

Date: 10/20/2020

South Row Elementary School

Evaluation of Basic HVAC System Operations

Room	Unit Ventilator Functional	Exhaust Air Functional	Notes
101	No (space temp. satisfied)	No	
102	No (space temp. satisfied)	No	
103	No (space temp. satisfied)	No	
104	No (space temp. satisfied)	No	See Detailed Operation Notes
105	Yes	No	
106	No (space temp. satisfied)	No	
107	No (space temp. satisfied)	No	
108	No (space temp. satisfied)	No	Exhaust blocked
109	No (space temp. satisfied)	No	
110	--	--	Occupied
111 Library	No (space temp. satisfied)	No	
112	--	--	Occupied
113 Tech	No (space temp. satisfied)	No	
114	--	--	Occupied
115	Yes	No	Cycled off while in room
116	Yes	No	
117	Yes	Yes	See Detailed Operation Notes
118	Yes	No	
119	Yes	No	
120	Yes	No	
121	No (space temp. satisfied)	No	Exhaust blocked
122	Yes	No	See Detailed Operation Notes
123	No (space temp. satisfied)	No	
124	Yes	No	
Modular 1	Yes	Yes (RA)	Forced Air
Modular 2	Yes	Yes (RA)	See Detailed Operation Notes
Nurse	No (space temp. satisfied)	0 in room, EX in toilet	See Detailed Operation Notes
129	N/A	N/A	See Detailed Operation Notes
130	No (space temp. satisfied)	N/A	
131	No (space temp. satisfied)	No	
132	No (space temp. satisfied)	No	
Portable 3	Yes (RTU)	Yes (RA)	
Portable 4	Yes (RTU)	Yes (RA)	
Portable 5	Yes (RTU)	Yes (RA)	
Portable 6	Yes (RTU)	Yes (RA)	See Detailed Operation Notes
Portable 7	Yes (RTU)	Yes (RA)	
Portable 8	Yes (RTU)	Yes (RA)	

Note: It was determined that the unit ventilator fan operation is set to operate upon the need for space heating or cooling. The controls programming needs to be revised to allow fan operation independent of temperature setpoint.



Date: 10/20/2020

South Row Elementary School

Detailed HVAC System Operations

Classroom	Supply Air Volume	Return Air Volume	Outside Air Volume	Damper & Control Valve Function	Filter Condition	Notes
104	0	0	0	All Ok	Ok	Fan off/power off
117	837	64	773	All Ok	Ok	
122	838	51	787	Face & Bypass not operational	Ok	
Modular 2	1,558	1,240	318	N/A	None	Forced air/Bard Unit
128 Nurse	N/A	N/A	N/A	N/A	Ok	Ductless Split/Fan off
131	0	0	0	Not Operational	Ok	Not Operational
Portable 6	662	565	97	N/A	Bad	Forced air/ RTU

Date: 10/20/2020

Chelmsford Public Schools South Row Elementary School



Photo 1



Photo 2



Photo 3



Photo 4

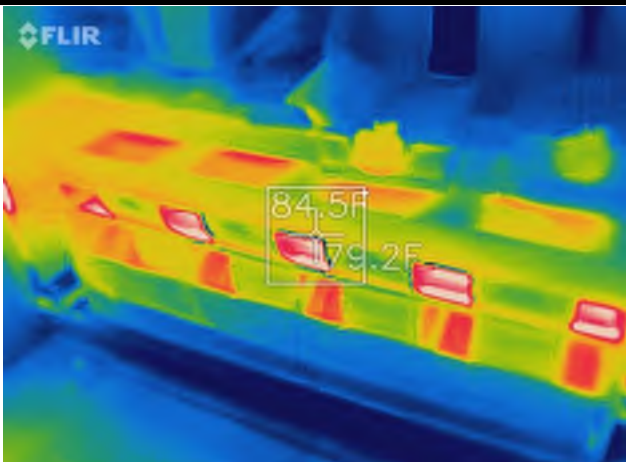


Photo 5



Photo 6

Date: 10/19/2020

Chelmsford Public Schools HVAC Assessment

Community Education Building

General Information

Address:	170 Dalton Road	Building Area:	37,100 sf
Original Year Built:	1968	Building Use:	Pre-K
Building Additions:		Student Capacity:	67 students
Notes:			

HVAC Approach & Applicable Strategies

The goal of this effort is to improve the indoor air quality in the schools to reduce potential health risks associated with the reopening of school buildings and keep students and staff as safe as possible. Improving indoor air quality to reduce the spread of the virus and help maintain clean surfaces is a key strategy that can be incorporated into a layered defense against COVID-19 including social distancing, face coverings, cleaning & sanitation, etc.

Current guidance calls primarily for three risk mitigating actions related to HVAC systems:

- *Increase HVAC system outdoor air ventilation
- *Add or increase air filtration
- *Consider supplementing systems with air cleaning devices

Use Mechanical Ventilation	Yes, through UVs	Use MERV 13 filters:	No
Increase Ventilation	Yes, through UVs	Use Portable Filter Units:	Optional
Operate Exhaust Fans:	Yes	Open Windows:	Optional

Classroom Information

Number of Classrooms:	22	Normal Occupancy:	6-8
Typical Classroom Area(s):	900	Proposed Occupancy:	4-6
Typical Ceiling Height(s):	9.5	Operable Windows:	Yes
		Window Information:	Double Pane
Notes:			

Existing Classroom HVAC Information

		Filters:	
Heating System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: HW Boilers		
A/C System(s):	Terminal: Split DX	Filter Type(s)/MERV	8
	Central: N/A		
Ventilation System(s):	Terminal: Unit Ventilators	Filter Type(s)/MERV	8
	Central: N/A		
Air Distribution:	Ducted Exhaust in Classrooms	Energy Mgmt System:	Yes
Building Exhaust Systems:	Yes		
Notes:	3 EF's not operating		

Date: 10/19/2020

Community Education Building

Evaluation of Basic HVAC System Operations

Room	Unit Ventilator Functional	Exhaust Air Functional	Notes
102 Rec.	Yes	No	No Exhaust
Health Office	No	Yes	See Detailed Operation Notes
Staff Room	Yes	N/A	
135	Yes	Yes	See Detailed Operation Notes
140 Room 9	Yes	Yes	See Detailed Operation Notes
147 Room 7	Yes	Yes	
148 Room 5	Yes	Yes	
149 Room 3	Yes	Yes	Fans in window
156 Room 1	Yes	Yes	
168 Room 2	Yes	Yes	See Detailed Operation Notes
163 Room 4	Yes	Yes	
162 Room 6	Yes	No	
161 Room 8	Yes	Yes	Fans in window
160 Room 10	Yes	Yes	Split AC unit
201 Room 20	Yes	Yes	See Detailed Operation Notes
208 Room 17	Yes	Yes	Split AC unit
209 Room 15	Yes	Yes	
210 Room 13	Yes	Yes	Split AC unit
214 Room 11	Yes	Yes	See Detailed Operation Notes
225 Room 12	Yes	Yes	
224 Room 14	Yes	Yes	AC unit, return grille blocked
223 Room 16	Yes	Yes	Split AC unit
222 Room 18	Yes	No	Split AC unit, exhaust not operating
221 Room 19	Yes	Yes	Split AC unit, return grille blocked
201 Room 21	Yes	Yes	Split AC unit

Date: 10/19/2020

Community Education Building

Detailed HVAC System Operations

Classroom	Supply Air Volume	Return Air Volume	Outside Air Volume	Damper & Control Valve Function	Filter Condition	Notes
Health Office	0	0	0	N/A	Ok	EA only
135	411	95	390	Both Ok	Ok	
20	858	150	708	Both Ok	Ok	RA blocked. Wire mesh screen at cabinet base is 100% closed
11	709	129	580	Both Ok	Ok	
9	763	54	412	Both Ok	Ok	
2	794	350	445	Both Ok	Ok	Filter in backwards

Note: For rooms with unit ventilators, a plenum wall cavity has been constructed for return and outside air. There is a lot of leakage around the walls, so the RA & OA readings are not as reliable to the true conditions.

Chelmsford Public Schools Community Education Building



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5

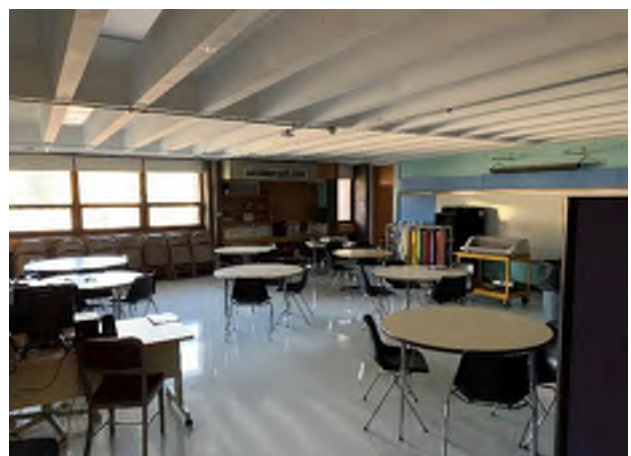


Photo 6

VI – Test and Balance Reports

COMPANY INFORMATION

Company Name

Balancing Technologies, Inc.

Street Address
City, State Zip
Phone

**20 Mill Street, Suite 190
Pepperell, MA 01463
Phone: 978-925-9383**

DATE:

10/19/2020

PROJECT:

CHELMSFORD
SCHOOL SYSTEM

SYSTEM:

AIR DIAGNOSTICS
ON
UNIT VENTILATORS

READING BY:

JM & JBM

JOB NUMBER

20-120 thru 20-127

PROJECT INFORMATION

Project: Chelmsford School System

Location: Chelmsford, MA 01824

Date: 10/19/2020

Architect: NOT LISTED

Engineer: NOT LISTED

General Contractor:
NOT LISTED

Mechanical Contractor:
NOT LISTED

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



AIR BALANCING DIAGNOSTIC REPORT

The following is a report containing the results of measurements we have taken on your air conditioning and heating systems on the date shown. These tests have been performed according to standards published by the National Comfort Institute. We have earned a certification from that organization to perform this testing. Less than 4,000 people in the world hold residential or commercial air balancing certifications. We have used calibrated tools to take these measurements. Many of these instruments are still made one at a time.

We certify that this testing has been performed in accordance with the Standards and Procedures published by the National Comfort Institute.

The purpose of this testing is to measure the operating conditions of your systems and compare that information to industry standards and the equipment manufacturer's engineering data. This reveals where improvements can be made to increase your comfort and the system's efficiency. We have identified deficiencies the testing has revealed, and propose a range of solutions for you to consider.

We are confident in our ability to diagnose and solve problems related to your comfort. Many of these problems have gone undetected in our industry for decades. Because of new technology and our understanding of measurement methods discovered centuries ago, we are able to deliver a new level of service that is extremely rare.

Submitted by: Balancing Technologies, Inc.

DATE:

10/19/2020

PROJECT:

CHELMSFORD
SCHOOL SYSTEM

SYSTEM:

AIR DIAGNOSTICS
ON
UNIT VENTILATORS

READING BY:

JM & JBM

JOB NUMBER

20-120 thru 20-127

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



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DATE:

10/19/2020

PROJECT:

CHELMSFORD SCHOOL
SYSTEM

SYSTEM:

AIR DIAGNOSTICS
ON
UNIT VENTILATORS

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Pepperell, MA 01463
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DATE:

10/19/2020

PROJECT:

CHELMSFORD SCHOOL
SYSTEM

SYSTEM:

AIR DIAGNOSTICS
ON
UNIT VENTILATORS

READING BY:

JM & JBM

JOB NUMBER

20-120 thru 20-127

Balancing Technologies, Inc.

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Pepperell, MA 01463
Phone: 978-925-9383



Certification Report

The data presented in this report is an exact record of system performance and was obtained in accordance with the NCI Standard Procedures. Any variances from design quantities which exceed NCI tolerances are noted throughout this report.

The air distribution systems have been tested and balance and final adjustments have been made in accordance with NCI "Procedural Standards for Testing, Adjusting, Balancing of Environmental Systems" and the project specifications.

TAB FIRM: Balancing Technologies, Inc
TAB SUPERVISOR: Joseph P Millett
NCI CERTIFICATION NUMBER: 175
CERTIFICATION EXPIRATION DATE: 6/18/2021



DATE:
10/19/2020

PROJECT:
CHELMSFORD SCHOOL
SYSTEM

SYSTEM:
AIR DIAGNOSTICS
ON
UNIT VENTILATORS

READING BY:
JM & JBM

JOB NUMBER
20-120 thru 20-127

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



TEST INSTRUMENT CALIBRATION REPORT

INSTRUMENT	MANUFACT.	MODEL #	SERIAL #	APPLICATION	CAL. DATE
Hydronic Manometer	Alnor	HM670	71133081	0-100 FT H2O	8/13/2020
Mini-Temp IR Thermometer	Raytek	NL	100490	Full range of thermocouples for temperatures	8/13/2020
Tachometer	Shimpo	DT-205L	C1130011R	6-98,882 RPM Contact or Non-Contact	8/13/2020
Vane Anemometer	Alnor	RVA801	A02439	80-5,000 RPM rotating vane, 4" alloy head	8/13/2020
Airdata Multimeter	Shortridge	ADM-880C	M10652	Velocity/Pressure/Temperature/Humidity	8/13/2020
Flow Hood	Shortridge	Asford School S	M10652	30 to 2000 CFM 24x48", 24x24", 36x36", 24x48"	8/13/2020
Digital Manometer	Testo	510	38977403/106	Various scales 0-1/4", 0-1", 0-5", 0-40"	8/13/2020
Digital Manometer	Testo	510	43411850/301	Various scales 0-1/4", 0-1", 0-5", 0-40"	8/13/2020
Mini-Thermohygrometer	Testo	605-H2	41201547	Full range of thermocouples for temperatures	8/13/2020
Pipe Clamp	Testo	115I	49495710	-40° to 302 °F / -40 to +150 °C	8/13/2020
Pipe Clamp	Test	115I	49495712	-40° to 302 °F / -40 to +150 °C	8/13/2020
Leakator	Bacharach	10	1019	All hydrocarbons/combustible gases, including but not limited to: acetone, acetylene, benzene, butane, ethanol, gasoline, hexane, hydrogen, industrial solvents, methane, naptha, natural gas, paint thinners and propane	8/13/2020
Thermo-Hygrometer	Testo	605I	49332564	0 to 100 %rH	8/13/2020
Digital Manometer	Testo	510I	49125282	Various scales 0-1/4", 0-1", 0-5", 0-40"	8/13/2020
Vane Anemometer	Testo	410I	49027523	78.7 to 5906 fpm / 0.4 to 30 m/s	8/13/2020
IR Thermometer	Testo	805I	49628806	-22° to 482 °F / -30 to +250 °C	8/13/2020
Thermo-Anemometer	Testo	405I	48931526	0 to 5906 fpm / 0 to 30 m/s	8/13/2020
Pitot Tubes	Dwyer	None	None	12", 18", 24, 36, 48 and 60"	NA
	Alnor	EBT731	EBT732035021	Velocity/Pressure/Temperature/Humidity	8/28/2020

NOTE: N.I.S.T. Certificates of calibration and testing will be provided upon request.

Project Symbols & Abbreviations

ACH	Air Changes Per Hour	FCU	Fan Coil Unit
AHU	Air Handeling Unit	FH	Fume Hood
AMP	Amperage	FG	Floor Grille
AVG	Average	FLA	Full Load Amps
AD	Air Density	FPB	Fan Powered Box
BAS	Building Automation System	FPM	Feet Per Minute
BHP	Chelmsford School System	FT HD	Feet of Head
CC	Coiling Coil	GPM	Gallons Per Minute
CS	Ceiling Supply	HC	Heating Coil
CCW	Chiled Water	HEPA	High Efficiency Particulate Arrestance
CEX	Ceiling Exhaust	HP	Horsepower
CFM	Cubic Feet Per Minute		Heating, Ventilation and Air Conditioning
CH	Chiller	HVAC	
CR	Ceiling Return	HW	Hot Water
CT	Cooling Tower	HW	Hot Water
CW	Condensor Water	HX	Heating Exchanger
DB	Dry Bulb	ID	Inside Diameter
DD	Direct Drive	L	Louver
DNA	Data Not Available	LAT	Leaving Air Temperature
DNL	Data Not Listed	LD	Linear Difuser
EAT	Entering Air Temperature	LWG	Low Wall Sidewall Grill
EDH	Electric Duct Heater		Leaving Water Temperature
EF	Exhaust Fan	LWT	Temperature
EMS	Energy Management System		Leaving Water Temperature
EXT	External Static Pressure	LWT	Temperature
F	Degrees Fahrenheit	MAU	Make Up Air Unit

DATE:

10/19/2020

PROJECT:

CHELMSFORD SCHOOL
SYSTEM

SYSTEM:

AIR DIAGNOSTICS
ON
UNIT VENTILATORS

READING BY:

JM & JBM

JOB NUMBER

20-120 thru 20-127

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



Project Symbols & Abbreviations

NA	Not Accessible	TSP	Total Static Pressure
NI	Not Installed	UH	Unit Heater
NT	Not Taken	V	Volts
NVL	No Valid Location	VAV	Variable Air Volume
NZ	Nozzle	VD	Volume Damper
OBD	Opposed Blade Damper	VFD	Variable Frequency Drive
OD	Chelmsford School System		
OSA	Outside Air	VP	Velocity Pressure
OAT	Outside Air Total	W	Watts
PF	Power Factor	W	Watts
PSI	Pounds Per Square Inch	WB	Wet Bulb
PT	Pitot Traverse	WG	Water Gauge
RA	Return Air	WSHP	Water Source Heat Pump
RHC	Reheat Coil		
RPM	Revolutions Per Minute		
RTU	Roof Top Unit		
SA	Supply Air		
SAT	Supply Air Temperature		
SWEX	Sidewall Exhaust Grille		
SF	Supply Air Fan		
SF	Service Factor		
SP	Static Pressure		
T	Thermostat		
TAB	Testing, Adusting and Balancing		

DATE:

10/19/2020

PROJECT:

CHELMSFORD SCHOOL
SYSTEM

SYSTEM:

AIR DIAGNOSTICS
ON
UNIT VENTILATORS

READING BY:

JM & JBM

JOB NUMBER

20-120 thru 20-127

Balancing Technologies, Inc.

20 Mill St Suite 190
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Phone: 978-925-9383







AIR CHANGES PER HOUR REPORT




Project:	Harrington Elementary School	Project Number:	20-126
Location:	120 Richardson Rd Chelmsford, MA	Owner:	City of Chelmsford
Date:	10/19/2020	Mechanical Contractor:	Not Listed
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
	NURSE		PTAC was on high.	
	ROOM 1A		There is no unit heater, supply or return in this room	
	ROOM 1A		Has a Kiln installed in the room without any makeup air or ventilation.	
	ROOM 1A		This room has a private restroom, the RGD was read and recorded as exhaust for that space	



	Project:	BYAM Elementary School	Project Number:	20-122
	Location:	25 Maple Rd. Chelmsford, MA 01824	Owner:	City of Chelmsford
	Date:	10/20/2020	Mechanical Contractor:	Not Listed
	TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
	NURSE	10/20/2020	PTAC is on high	
	READING C1	10/20/2020	No Supply, Return or Exhaust. RGD's in the space. There is one exhaust grill in the restroom in the space	
	READING C1	10/20/2020	The only source of heat/ventilation is a cabinet unit heater	



Project:	BYAM Elementary School	Project Number:	20-122
Location:	25 Maple Rd. Chelmsford, MA 01824	Owner:	City of Chelmsford
Date:	10/20/2020	Mechanical Contractor:	Not Listed
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
ROOM 2 - SA	26.5	33	9.5	8308	7X48	684		4.94
ROOM 2 - RA					10X36	0		
ROOM 2 - OA					5X58	456		
ROOM 2 - EX					14X16	332		
	UV - 1							
ROOM 8 - SA	34	40	9.5	12920	7X48	702		3.26
ROOM 8 - RA					10X36	0		
ROOM 8 - OA					5X58	466		
ROOM 8 - EX					14X16	375		
	UV - 1							
ROOM 15 - SA	34	26.5	9.5	8560	7X48	656		4.6
ROOM 15 - RA					10X36	94		
ROOM 15 - OA					5X58	465		
ROOM 15 - EX					14X16	315		
	UV - 1							
ROOM 16 - SA	34	26.5	9.5	8560	7X48	704		4.93
ROOM 16 - RA					10X36	87		
ROOM 16 - OA					NL	410		
ROOM 16 - EX					14X36	176		
	UV - 1							
ROOM 21 - SA	34	26	9.5	8398	7X48	709		5.06
ROOM 21 - RA					10X36	151		
ROOM 21 - OA					5X58	368		
ROOM 21 - EX					14X16	296		

Remarks:




Project:	BYAM Elementary School	Project Number:	20-122
Location:	25 Maple Rd. Chelmsford, MA 01824	Owner:	City of Chelmsford
Date:	10/20/2020	Mechanical Contractor:	Not Listed
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
			TOTAL	2451				
COVID WAITING - SA	13	18	9.5	2223	7X36	513		12.59
COVID WAITING - SA	4	6	9.5	228				
COVID WAITING - RA					14X14	60		
COVID WAITING - OA					9X61	278		
COVID WAITING - EX					8X18	109		
NURSE - SA	26	12	9.5	2964	4X29	458		9.27
NURSE - RA					9X38	162		
NURSE - OA					NL	0		
NURSE - EX					NL	0		
			TOTAL	4579				
ROOM READING C1 - SA	18	25	9.5	4275	NA	0		
ROOM READING C1 - SA	4	8	9.5	304	NA	0		
ROOM READING C1 - RA					NA	0		
ROOM READING C1 - OA					NA	0		
ROOM READING C1 - EX					NA	0		
REST ROOM - EX	9	6	9.5	513	10X8	167		
	RTU - 1				TOTAL	586		
PORTABLE CLASS 5 - SA1	27	28	8	6048	24X24	109		5.81
PORTABLE CLASS 5 - SA2					24X24	116		
PORTABLE CLASS 5 - SA3					24X24	109		
PORTABLE CLASS 5 - SA4					24X24	128		
PORTABLE CLASS 5 - SA5					24X24	127		
PORTABLE CLASS 5 - RA					24X6	446		
PORTABLE CLASS 5 - OA					NL	140		
PORTABLE CLASS 5 - EX					NL	0		

Remarks:

	Project:	Center Elementary School	Project Number:	20-125
	Location:	84 Billerica Rd. Chelmsford, MA 01824	Owner:	City of Chelmsford
	Date:	10/19/2020	Mechanical Contractor:	Not listed
	TAB Firm:	Balancing Technologies, Inc	Certified TAB Technician:	JM & JBM

NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
	SPED / PYSCH	10/19/2020	OA for UV was divided evenly between both rooms	
	SPED 2/ PYSCH	10/19/2020	OA for UV was divided evenly between both rooms	



Project:	Center Elementary School	Project Number:	20-125
Location:	84 Billerica Rd. Chelmsford, MA 01824	Owner:	City of Chelmsford
Date:	10/19/2020	Mechanical Contractor:	Not Listed
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
ROOM 1	UV-1		TOTAL	7398				
ROOM 1 - SA	29	25.5	9	6655	7X70	958		7.7
ROOM 1 - SA	7.5	11	9	743				
ROOM 1 - RA					3X72	592		
ROOM 1 - OA					40X16	366		
ROOM 1 - EX					16X12	449		
ROOM 1 - EX					6X10	41		
ROOM 8	UV-1							
ROOM 8 - SA	31	28	9	7812	7X70	887		6.81
ROOM 8 - RA					3X72	693		
ROOM 8 - OA					40X16	194		
ROOM 8 - EX					16X12	474		
ROOM 9	UV-1							
ROOM 9 - SA	29	30	9	7830	7X70	853		6.53
ROOM 9 - RA					3X72	585		
ROOM 9 - OA					40X16	268		
ROOM 9 - EX					16X12	118		
ROOM 23	UV - 1							
ROOM 23 - SA	28.5	29.5	9	7567	7x70	745		5.91
ROOM 23 - RA					3X72	450		
ROOM 23 - OA					40X16	295		
ROOM 23 - EX					16X12	503		
NURSE	UV-1		TOTAL	3224				
NURSE - SA	19.5	15.5	9	2720	45X7	665		12.38
NURSE - SA	7	8	9	504				
NURSE - RA					48X3	362		
NURSE - OA					40X16	303		
NURSE REST ROOM - EX	7.5	8.5	8	510	6X6	36		

Remarks:




Project:	Center Elementary School	Project Number:	20-125
Location:	84 Billerica Rd. Chelmsford, MA 01824	Owner:	City of Chelmsford
Date:	10/19/2020	Mechanical Contractor:	Not Listed
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
PORTABLE CLASSROOM 1	28		8	6048	TOTAL	719		7.13
PORTABLE CLASSROOM 1 - SA-1					24X24	151		
PORTABLE CLASSROOM 1 - SA-2					24X24	154		
PORTABLE CLASSROOM 1 - SA-3					24X24	143		
PORTABLE CLASSROOM 1 - SA-4					24X24	130		
PORTABLE CLASSROOM 1 - SA-5					24X24	141		
PORTABLE CLASSROOM 1 - RA					32X6	583		
PORTABLE CLASSROOM 1 - OA					NA	136		
	UV-1							
SPED 1 SA	15	15	7	1575	9X9	147		5.6
PYSCH - SA	15	15	8	1800	12X12	250		8.33
SPED 1 - RA					36X6	259		
PYSCH - RA					10X10	0		
SPED 1 - OA					NA	69		
PYSCH - OA					NA	69		
SPED 1 - EX					8X8	83		
PYSCH - EX					NA	0		
	UV - 1							
SPED 2 - SA	12	14	7	1176	12X12	242		12.35
SPEECH - SA	12	14	8	1344	12X12	220		9.82
SPED 2 - RA					16X16	259		
SPEECH - RA					NA	0		
SPED 2 - OA					NA	101		
SPEECH - OA					NA	101		
SPED 2 - EX					10X10	0		
SPEECH - EX					10X10	21		
	UV - 1							
UPPER LIBRARY - SA	33	27	10	8910	45X7	648		4.07
UPPER LIBRARY - SA	18	12	3	648				
UPPER LIBRARY - RA					48X3	187		
UPPER LIBRARY - OA					40X16	461		

Remarks:

	Project:	South Row Elementary School	Project Number:	20-127
	Location:	250 Boston Rd. Chelmsford, MA	Owner:	City of Chelmsford
	Date:	10/28/2020	Mechanical Contractor:	Not Listed
	TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM. & JBM

NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
ROOM 31			UV was not running, service switch was off. When we turned it off Fan did not come on	
ROOM 104			UV was not running, service switch was off. When we turned it off Fan did not come on	
ROOM 117			Exhaust duct/grill needs to be cleaned	
ROOM 117			UV was doing half of the CFM as tested as found. We cycled the power, after the cycle the CFM is what was recorded	
ROOM 117			OA Damper shows 100% on Bas actual reading indicate damper is closed	
ROOM 122			Fan/Blower have holes cut in them. Poorly covered with foil tape	
MODULAR 2			Exhaust fan was not running	
MODULAR 2			No Filter installed	
MODULAR 6			Filters are dirty and need to be replaced	

PICTURES RELATED TO NOTES AND REMARKS



Room 122



Nurse Restroom - Needs RGD



Exhaust RGD's need to be cleaned along with duct

DATE:
10/28/2020

PROJECT:
SOUTH ROW


SYSTEM:
ENTIRE SPACE

READING BY:
JM & JBM

JOB NUMBER
20-127

Balancing Technologies, Inc.
20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



	Project:	Parker Middle School	Project Number:	20-123
	Location:	75 Granite Road Chelmsford, MA	Owner:	City of Chelmsford
	Date:	10/28/2020	Mechanical Contractor:	
	TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
	Lounge / Copy		Exhaust RGD reading 0 CFM at time of testing. There is a sidewall exhaust fan outside not running	
	Nurse Restroom		Restroom exhaust is missing	
	Portable Room 3		This is a 3 Ton Rooftop could be slowed down	
	Room 212		Filter is not accessible	
	Room 212A		2 RGD's exhasut & return are reading 0 CFM	
	Portable Room 1		No Economizer Installed	
	Portable Room 3		No Economizer Installed	



Project:	Parker Middle School	Project Number:	20-123
Location:	75 Granite Road Chelmsford, MA	Owner:	City of Chelmsford
Date:	10/28/2020	Mechanical Contractor:	Mechanical Contractor:
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
	UV - 1		Fan On Low					
ROOM 101 - SA	26	28	9.5	6916	5x58	354		3.07
ROOM 101 - RA					3x60	112		
ROOM 101 - OA					NL	242		
ROOM 101 - EX					18x12	161		
	UV - 1		Fan On Low					
ROOM 104 - SA	28	28	9.5	7448	5x58	688		8.64
ROOM 104 - RA					3x60	356		
ROOM 104 - OA					NL	333		
ROOM 104 - EX					18x12	189		
	UV - 1		Fan On Low					
ROOM 109 - SA	26	27.5	9.5	6792	5x56	775		6.85
ROOM 109 - RA					3x60	295		
ROOM 109 - OA					NL	480		
ROOM 109 - EX					18x12	309		
	UV - 1		Fan On Low					
ROOM 119 - SA	28	25	9.5	6650	5x58	627		5.66
ROOM 119 - RA					3x60	146		
ROOM 119 - OA					NL	481		
ROOM 119 - EX					18x12	0		
	UV - 1		Fan On Med					
ROOM 124 - SA	28	30	9.5	7980	5x56	782		5.88
ROOM 124 - RA					3x60	353		
ROOM 124 - OA					NL	429		
ROOM 124 - EX					18x12	351		
	UV - 1		Fan On Low					
ROOM 200 (NURSE) - SA	25	15	8	3000	5x62	733		12.3
ROOM 200 (NURSE) - RA	8	9	8	576	3x60	271		
ROOM 200 (NURSE) - OA					NL	462		
ROOM 200 (NURSE) - EX					18x12	560		
ROOM 200 RESTROOM (NURSE) - EX	7	8.5	7.5	446	10x10	68		
	UV - 1		Fan On Low					
ROOM 202 - SA	29	27	8	6264	5x58.5	694		6.65
ROOM 202 - RA					3x60	192		
ROOM 202 - OA					NL	502		
ROOM 202 - EX					18x12	310		

Remarks:



Project:	Parker Middle School	Project Number:	20-123
Location:	75 Granite Road Chelmsford, MA	Owner:	City of Chelmsford
Date:	10/28/2020	Mechanical Contractor:	Mechanical Contractor:
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
	UV - 1							
ROOM 212 A - SA	25.5	24	10	6120	TOTAL	717		7.03
ROOM 212 A - SA1					24x24	360		
ROOM 212 A - SA2					24x24	357		
ROOM 212 B - SA					TOTAL	667		6.54
ROOM 212 B - SA1					24x24	330		
ROOM 212 B - SA2					24x24	377		
ROOM 212 A - RA					TOTAL	0		
ROOM 212 A - RA1					18x18	0		
ROOM 212 A - RA2					18x18	0		
ROOM 212 B - RA					TOTAL	1190		
ROOM 212 B - RA1					18x18	595		
ROOM 212 B - RA2					18x18	595		
ROOM 212 A - OA					NL	97		
ROOM 212 B - OA					NL	97		
ROOM 212 A - EX					NL	0		
ROOM 212 B - EX					NL	0		
	UV - 1		Fan On Low					
ROOM 217 - SA	26.5	27	9.5	6797	5x58	552		4.87
ROOM 217 - RA					3x60	201		
ROOM 217 - OA					NL	351		
ROOM 217 - EX					18x12	420		
	UV - 1		Fan On Med					
ROOM 218 - SA	26	29	9.5	7163	5x58	851		7.12
ROOM 218 - RA					3x60	308		
ROOM 218 - OA					NL	543		
ROOM 218 - EX					18x12	504		
	UV - 1		Fan On Med					
ROOM 225 - SA	26.5	27	9.5	6797	5x58	711		6.27
ROOM 225 - RA					3x60	258		
ROOM 225 - OA					NL	453		
ROOM 225 - EX					18x12	817		

Remarks:



Project:	Parker Middle School	Project Number:	20-123
Location:	75 Granite Road Chelmsford, MA	Owner:	City of Chelmsford
Date:	10/28/2020	Mechanical Contractor:	Mechanical Contractor:
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
	UV - 1		Fan On Med					
ROOM 232 - SA	26.5	45	9.5	11329	5x62	954		5.05
ROOM 232 - RA					3x60	498		
ROOM 232 - OA					NL	456		
ROOM 232 - EX					18x12	747		
	UV - 1		Fan On Med					
ROOM 240 - SA	33	24	8.5	6732	5x62	1030		9.18
ROOM 240 - RA					3x60	320		
ROOM 240 - OA					NL	710		
ROOM 240 - EX					18x12	0		
LOUNGE / COPY - EX	24	16	9	3456	18x18	0		
	RTU - 1							
PORTABLE CLASSROOM 1 - SA	27	34	8	7344	TOTAL	1152		9.41
PORTABLE CLASSROOM 1 - SA1					24x24	174		
PORTABLE CLASSROOM 1 - SA2					24x24	181		
PORTABLE CLASSROOM 1 - SA3					24x24	242		
PORTABLE CLASSROOM 1 - SA4					24x24	149		
PORTABLE CLASSROOM 1 - SA5					24x24	155		
PORTABLE CLASSROOM 1 - SA6					24x24	251		
PORTABLE CLASSROOM 1 - RA					NL	1152		
PORTABLE CLASSROOM 1 - OA					NL	NI		
PORTABLE CLASSROOM 1 - EX					NI	0		
	RTU - 1							
PORTABLE CLASSROOM 3 - SA	34	27	8	7344	TOTAL	1412		11.54
PORTABLE CLASSROOM 3 - SA1					24x24	192		
PORTABLE CLASSROOM 3 - SA2					24x24	286		
PORTABLE CLASSROOM 3 - SA3					24x24	234		
PORTABLE CLASSROOM 3 - SA4					24x24	219		
PORTABLE CLASSROOM 3 - SA5					24x24	265		
PORTABLE CLASSROOM 3 - SA6					24x24	216		
PORTABLE CLASSROOM 3 - RA					NL	1412		
PORTABLE CLASSROOM 3 - OA					NL	NI		
PORTABLE CLASSROOM 3 - EX					NI	0		

Remarks:

FACILITIES MANAGER PM SUMMARY

Room	Equipment	Number of Belts	Belt Size	Number of Filters	Filter Size	Filter Type	Merv Rating
ROOM 101	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
ROOM 104	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
ROOM 109	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
ROOM 119	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
ROOM 124	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
ROOM 200	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
ROOM 202	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
ROOM 212B	UV - 1	NA	NA	1	NOT ACCESSABLE		
ROOM 217	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
ROOM 218	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
ROOM 225	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
ROOM 232	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
ROOM 240	UV - 1	NA	NA	1	9x62.25x2	PLEATED	8
PORTABLE CLASS 1	RTU - 1	NA	NA	2	16x25x2	PLEATED	NL
PORTABLE CLASS 3	RTU - 1	NA	NA	2	16x25x2	PLEATED	NL

REMARKS

DATE:
10/28/2020

PROJECT:

PARKER
MIDDLE
SCHOOL

SYSTEM:

AIR DIGNOSTICS
ON
UNIT VENTILATORS


READING BY:


JM & JBM

JOB NUMBER
20-123

Balancing Technologies, Inc.
20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



	Project:	McCarthy Middle School	Project Number:	20-124
	Location:	250 North RD. Chelmsford, MA	Owner:	City of Chelmsford
	Date:	10/29/2020	Mechanical Contractor:	
	TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM. & JBM.
NBC TAB Notes & Remarks				
ITEM No.	SYSTEM	DATE	ISSUE	Status
			All OA dampers are set at 10% according to BAS systems. When power is lost, it appears that the dampers fail to shut. Further investigation and retesting and balancing would be need to test and set these properly	
GENERAL REMARKS		10/29/2020		
			Side C doors were open. Building was under a severe negative. Hallway was reading we have 8036 CFM entering from outside	
GENERAL REMARKS		10/29/2020		
			All unit ventilators need to be cleaned including the perforated plates under the filters, they are very dirty and restrictive.	
GENERAL REMARKS		10/29/2020		
			No outside air	
POD 2		10/29/2020		
			This room has a ductless split installed	
OFFICE		10/29/2020		
			4 Ton unit providing 3 tons of air	
MOD #2		10/29/2020		
			Fume Hood did not work on High. On low it falls well below safety guidelines of 100 CFM. Should not be used until corrected.	
ROOM 102		10/29/2020		
			Exhaust RGD was positive	
ROOM 102		10/29/2020		
			Face & bypass damper not responding both dampers are closed	
ROOM 105		10/29/2020		
			When the unit was powered off, there was no control damper movement	
ROOM 105		10/29/2020		
			Unit Ventilator fan was turned off when we entered the room. We turned it on for testing and left it on.	
ROOM 105		10/29/2020		
			Dampers operated correctly on shut down, however, the OA damper has not been properly set for scheduled daily operation	
ROOM 109		10/29/2020		
			Has an air handler & unit ventilator serving this space	
ROOM 109		10/29/2020		

	Project:	McCarthy Middle School	Project Number:	20-124
	Location:	250 North RD. Chelmsford, MA	Owner:	City of Chelmsford
	Date:	10/29/2020	Mechanical Contractor:	
	TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM. & JBM.
NBC TAB Notes & Remarks				
ITEM No.	SYSTEM	DATE	ISSUE	Status
ROOM 109		10/29/2020	Unit Ventilator needs to be cleaned	
ROOM 109		10/29/2020	Has a unit ventilator as well as another piece of equipment	
ROOM 115		10/29/2020	Exhaust Duct needs to be cleaned	
ROOM 115		10/29/2020	Exhaust RGD was reading 60 CFM positive. Maybe fan is off? Corridor is also under a positive. Further testing would be needed to determine why this RGD was positive.	
ROOM 125		10/29/2020	Need Duct cleaning - RGD's are very dirty.	
ROOM 125		10/29/2020	UV - 1 OA actuator moved - RA Damper did not, when the unit was powered off. Return should fail open while OA fails closed.	
ROOM 133		10/29/2020	OA Damper & RA Damper were both closed. Appears RA Damper was bound. We freed the damper and reread the unit ventilator. 2 sets of readings are on the report	
ROOM 133		10/29/2020	UV was read on Low, Med, and high. No CFM changes on either setting. You could hear unit ramp up both OA and RA dampers are closed	
ROOM 140		10/29/2020	No Unit Ventilator in this room. It appears the exhaust RGD has been capped and painted over	
ROOM 215		10/29/2020	Exhaust RGD is positive 20 CFM	
ROOM 215		10/29/2020	UV - 1 Filter is fiberglass and plugged solid. Needs to be replaced ASAP to prevent premature motor burn out.	
ROOM 220		10/29/2020	When power was shut off on the unit ventilator the OA damper tired to close. The actuator stopped when the damper/linkage became bound. Damper did not fail 100% closed	
ROOM 220		10/29/2020	The exhaust RGD is damaged, fins closed and broken off. Needs to be replaced.	



Project:	McCarthy Middle School	Project Number:	20-124
Location:	250 North RD. Chelmsford, MA	Owner:	City of Chelmsford
Date:	10/29/2020	Mechanical Contractor:	
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM. & JBM.

NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
ROOM 220		10/29/2020	Unit Ventilator RA Damper was closed 100% at time of testing	
ROOM 222		10/29/2020	Water pipes are dripping in cabinet. Pipes were green and water was wiped off. No water on floor it appears to be a slow leak	

PICTURES RELATED TO NOTES AND REMARKS



Exhaust / Return RGD's



Room 215



Room 220

DATE:

10/28/2020

PROJECT:

McCARTHY MIDDLE SCHOOL

SYSTEM:

ENTIRE SPACE

READING BY:

JM & JBM

JOB NUMBER

20-124

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383





Project:	McCarthy Middle School	Project Number:	20-124
Location:	250 North RD. Chelmsford, MA	Owner:	City of Chelmsford
Date:	10/29/2020	Mechanical Contractor:	
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM. & JBM.

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
	UV - 1		Fan on Low					
ROOM 102 - SA	23	47.5	8.5	9286	11x79	456		2.95
ROOM 102 - RA					6x79	319		
ROOM 102 - OA					NL	137		
ROOM 102 - EX					10x12	28		
Hood				Fan on low	18x41	244		
				Fan on High	18x41	0		
	UV - 1		Fan on Med					
ROOM 105 - SA	39	21	8	6552	11x79	787		7.21
ROOM 105 - RA					6x79	738		
ROOM 105 - OA					NL	49		
ROOM 105 - EX					14x16	56		
	UV - 1		Fan on Low					
ROOM 109 - SA	23	31	9	6417	11x67	647		13.52
ROOM 109 - RA					6x67	33		
ROOM 109 - OA					NL	641		
ROOM 109 - EX					12x16	311		
	AHU - 1				TOTAL	772		
ROOM 109 - SA1					8x20	111		
ROOM 109 - SA2					8x20	144		
ROOM 109 - SA3					8x20	228		
ROOM 109 - SA4					8x20	289		
ROOM 109 - RA					24x24	447		
	UV - 1		Fan on Med					
ROOM 115 - SA	32.5	28.5	8	7410	11x67	508		4.11
ROOM 115 - RA					6x67	233		
ROOM 115 - OA					NL	276		
ROOM 115 - EX					14x16	60		
	UV - 1		Fan on Med					
ROOM 125 - SA	40.5	61	13.5	33352	11x79	612		2.99
ROOM 125 - RA					6x79	560		
ROOM 125 - OA					NL	52		
ROOM 125 - EX					12x12	103		

Remarks:

HOOD DATA SHEET

DATE:
10/29/2020

PROJECT:

McCARTHY
MIDDLE SCHOOL

SYSTEM:

AIR DIAGNOSTICS
ON
UNIT VENTILATORS

READING BY:

JM. & JBM.

JOB NUMBER
20-124

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383

Room	102		
Hood Size	Width x Height / 144 = Total Sq. Ft.		
	18	41	5.125
Hood Number	1		
Location	ROOM 102		
Hood Type	Fume		

	Test 1 On Low	Test 2	Test 3	Test 4	Test 5	Final FPM
1	42					
2	53					
3	48					
4						
5						
6						
7						
8						
9						
10						
11						
12						

Sash Height	18					
Design FPM	NL					
Average FPM	48					
Design CFM	NL					
Tested CFM	244					
% of Design						






Project:	McCarthy Middle School	Project Number:	20-124
Location:	250 North RD. Chelmsford, MA	Owner:	City of Chelmsford
Date:	10/29/2020	Mechanical Contractor:	
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM. & JBM.

AIR CHANGES PER HOUR REPORT


Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
	UV - 2		Fan on Med					
ROOM 125 - SA	40.5	61	13.5	33352	11x79	1052		
ROOM 125 - RA					6x79	851		
ROOM 125 - OA					NL	201		
ROOM 125 - EX					12x12	97		
(Pre - Readings)	UV - 1		Fan on Med					
ROOM 133 - SA	25	30	8.5	6375	11x67	311		2.93
ROOM 133 - RA					6x79	37		
ROOM 133 - OA					NL	274		
ROOM 133 - EX					10x24	32		
(Post - Readings)	UV - 1		Fan on Med					
ROOM 133 - SA	25	30	8.5	6375	11x67	755		7.11
ROOM 133 - RA					6x79	610		
ROOM 133 - OA					NL	145		
ROOM 133 - EX					10x24	32		
	UV - 1		Fan on Med					
ROOM 205 - SA	31.5	23.5	9	6662	11x67	634		5.71
ROOM 205 - RA					6x67	576		
ROOM 205 - OA					NL	58		
ROOM 205 - EX					14x16	590		
	UV - 1		Fan on Low					
ROOM 215 - SA	22.5	32	7.5	5400	TOTAL	924		10.27
ROOM 215 - SA1					24x24	452		
ROOM 215 - SA2					24x24	472		
ROOM 215 - RA1					16x16	612		
ROOM 215 - OA					NL	309		
ROOM 215 - EX					14x16	20	Wall RGD	
ROOM 215 - EX					16x16	728		
	UV - 1		Fan on Low					
ROOM 220 - SA	22	30	8	5280	11x67	654		7.43
ROOM 220 - RA					6x67	0		
ROOM 220 - OA					NL	654		
ROOM 220 - EX					10x24	0		

Remarks:

	Project:	Chelmsford High School	Project Number:	20-121
	Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
	Date:	10/21/2020	Mechanical Contractor:	Not Listed
	TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM


NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
RTU-3		#####	Coil needs to be cleaned	
RTU-3		#####	OA was at 15% that is min set point	
RTU-3		#####	Filters were clean	
RTU-7		#####	The power exhaust was running while testing, the economizer was at 30% damper.	
RTU-7		#####	Need to be cleaned, water in return section	
RTU-7		#####	Min OA damper position was 10%, the unit only got down to 30% damper position. Further testing and balancing / diagnostic testing would be required to correct this issue.	
RTU-10		#####	Needs to be cleaned	
RTU-10		#####	Pre filter's are fair	
RTU-11		#####	Need to be cleaned - Pollen / dander / dust all through blower section	
RTU-11		#####	One belt is very loose and slipping - tension needs to be set correctly. Motor re-alignment is necessary to prevent motor / bearing premature failure on this unit.	
RTU-11		#####	Pre-filters very dirty	
RTU-11		#####	This unit needs to be cleaning along with duct cleaning, from what we could see on the supply and return drops.	

	Project:	Chelmsford High School	Project Number:	20-121
	Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
	Date:	10/21/2020	Mechanical Contractor:	Not Listed
	TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM


NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
RTU-11		#####	Pre filters need to be replaced	
RTU-11		#####	There was no communication between unit and BAS	
RTU-11		#####	The min OA setpoint was unknown	
RTU-17		#####	Evaporator coil is dirty needs to be cleaned	
RTU-17		#####	Filters were wet	
RTU-17		#####	Economizer filter needs to be replaced	
RTU-17		#####	Hinges broke off filter door	
RTU-17		#####	Condensate trap is broken off unit	
RTU-17		#####	Water was in the filter section of the unit	
RTU-22		#####	Economizer filter needs to be replaced	
RTU-22		#####	The min OA set point is 10%	
RTU-22		#####	Belt is loose, should be tightened.	

	Project:	Chelmsford High School	Project Number:	20-121
	Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
	Date:	10/21/2020	Mechanical Contractor:	Not Listed
	TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM


NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
			The pulley on the fan, an designed for A belt. There is a B belt being used currently. This should be corrected. Because of the improper belt being used, the belt is fraying in the blower cabinet of the unit.	
	RTU-22	#####		
	AHU-15	#####	The filters solid. Need to be replaced ASAP	
	LECTURE HALL	#####	Was tested with zone damper open 100%	
	LECTURE HALL	#####	Has 60 monitors / workstations in this space	
	CAREER CENTER	#####	Has 1 RGD that is partially covered. While covered it provides 300 CFM, uncovered it delivers 390 CFM	
	CAREER CENTER	#####	Has 31 computer terminals	
	BOYS LOCKER	#####	Has 300 lockers	
	TEAM ROOM 1	#####	Has 60 lockers	
	TEAM ROOM 1	#####	Needs duct cleaning	
	TEAM ROOM 2	#####	Has 30 lockers	
	TEAM ROOM 2	#####	Needs duct cleaning	
	TEAM ROOM 2	#####	Has Diffuser falling from ceiling this needs to be corrected before it falls on someone.	

	Project:	Chelmsford High School	Project Number:	20-121
	Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
	Date:	10/21/2020	Mechanical Contractor:	Not Listed
	TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM


NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
	BOYS LOCKER - OFFICE	#####	Needs duct cleaning	
	BOYS LOCKER OFFICE	#####	Has 15 lockers	
	ATHLETIC DIRECTOR	#####	Exhaust RGD is reading a positive air flow. Needs further investigation / diagnostic testing to determine why.	
	ATHLETIC DIRECTOR	#####	Both CFM Valves were added together to arrive at Air Changes Per Hour	
	ATHLETIC SECRETARY	#####	Door pressure is .02 to the corridor	
	ATHLETIC SECRETARY	#####	With weight room door open we were neutral to corridor	
	STUDIO	#####	There was foam around the base of the Unit Ventilator. As found it was delivering 1061, when the foam was removed, the CFM increase to 1147	
	STUDIO	#####	OA Damper is off the shaft and unplugged	
	STUDIO	#####	Unit Ventilator completely blocked with tables, lights and electrical equipment.	
	STUDIO	#####	Unit Ventilator return blocked 100% by foam all around base	
	STUDIO OFFICE	#####	Supply diffuser is missing the center of it. The OBD is exposed. It is falling from the ceiling. Should be corrected as soon as possible to prevent from falling.	
	ROOM 106	#####	Needs to be cleaned	

	Project:	Chelmsford High School	Project Number:	20-121
	Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
	Date:	10/21/2020	Mechanical Contractor:	Not Listed
	TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
ROOM 117		#####	Needs to be cleaned	
ROOM 211		#####	Unit Ventilator is not running. Service switch is on and fan setting was on high	
ROOM 238		#####	Unit Ventilator was off. We turned it on and nothing, no fan. Unit was set on low	
ROOM 254		#####	Filter was not in the rack. Unit itself is very dirty. Coil is also dirty. OA Damper is closed on filter	
ROOM 254		#####	OA Damper is unresponsive	
ROOM 254		#####	Return / face of Unit Ventilator is in poor condition. Not able to put it together	
ROOM 254		#####	The exhaust RGD is connected to a fan directly	
ROOM 255		#####	Has 26 computers / work stations	
ROOM 255		#####	Has a fume hood. This hood was not moving any CFM, maybe capped or closed.	
ROOM 255		#####	Filter was solid & Wet	
ROOM 314		#####	Unit Ventilator not running. Motor is burnt out, needs to be replaced	
ROOM 324		#####	Filter door cover is missing	

	Project:	Chelmsford High School	Project Number:	20-121
	Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
	Date:	10/21/2020	Mechanical Contractor:	Not Listed
	TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

NBC TAB Notes & Remarks

ITEM No.	SYSTEM	DATE	ISSUE	Status
ROOM 328		#####	Exhaust RGD is covered in dust/dander.	
ROOM 328		#####	Was tested with zone damper open 100%	
RTU-6		#####	The outside air actuator was not connected to the shaft of the damper. This needs to be repaired and properly set	
RTU-6		#####	The return fan door is bent, it was not closed 100%. This needs to be repaired	
RTU-8		11/6/2020	2 of the filters installed were incorrect. They should have been 16x24x5 - installed was 2 - 16x24x4. Using incorrect filters allows air to bupass the filters and cause build up on the coil.	
RTU-9		11/6/2020	The coil and return section is dirty and needs to be cleaned.	
RTU-9		11/6/2020	The condensate trap has been damaged and needs to be repaired.	

PICTURES RELATED TO NOTES AND REMARKS



Studio - Unit Ventilator behind everything



Studio - Foam blocking the return on the unit ventilator



Studio - RGD



Studio - RGD



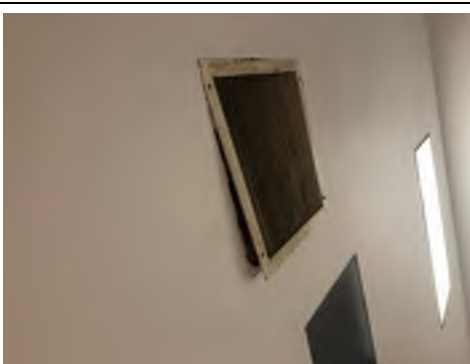
General remarks - many of the Exhaust / Return



Unit ventilator in room 255 (ceiling mounted unit)



Fume hoods - in rooms 111 & 117



Boys locker room

DATE:
10/21/2020

PROJECT:

CHELMSFORD HIGH SCHOOL

SYSTEM:

ENTIRE SPACE

READING BY:

JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

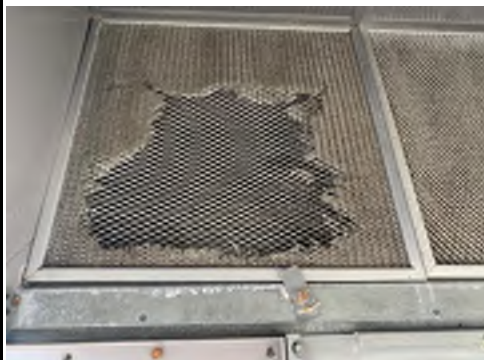
20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



PICTURES RELATED TO NOTES AND REMARKS



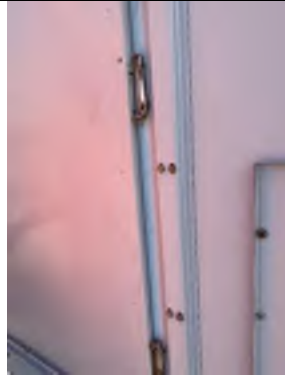
CONDITION OF ECONOMIZER FILTERS



CONDITION OF ECONOMIZER FILTERS



RTU-17 Condensate Trap



RTU-17 - Filter Access door



RTU-17 - Water in the unit - not the drain pan



Many of the return ducts - need to be cleaned



RTU - Filters



RTU-11 - inner belt is very loose - a video can be provided if needed.

DATE:
10/21/2020

PROJECT:

CHELMSFORD HIGH SCHOOL

SYSTEM:

ENTIRE SPACE

READING BY:

JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

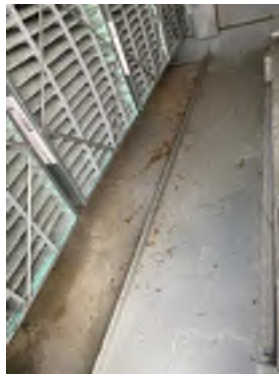
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Phone: 978-925-9383



PICTURES RELATED TO NOTES AND REMARKS



Evaporator coils



Inside the filter cabinets - need to be cleaned



Solid Filter



RTU-8 Incorrect filters



RTU-6



RTU-6



RTU-9



RTU-9

DATE:
10/21/2020

PROJECT:
CHELMSFORD HIGH SCHOOL

SYSTEM:
ENTIRE SPACE

READING BY:
JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



ECONOMIZER TEST REPORT

ECONOMIZER DATA		SUMMARY	DESIGN	ACTUAL
MANUFACTURER	CARRIER	Min. Fresh Air CFM	NL	1806
MODEL	48HJM015	Max. Fresh Air CFM	NL	NT
SERIAL	1706U07168	DB TEMPERATURES / BTU GAIN		
LOUVER AREA	68 X 17	RAT Return Air Temperature	NL	NT
ENTHALPY CONTROL?	NO	OAT Outside Air Temperature	NL	NT
FAN POWERED EXHAUST?	YES	MAT Mixed Air Temperature	NL	NT
		Percent of Outside Air	NL	NT
		SBTU Gain = CFM X 1.08 X Δt	NL	NT

CALCULATIONS	MINIMUM	MAXIMUM	WB TEMPERATURES / BTU GAIN	
TOTAL READINGS (FPM)	698	NA	OAT Outside Air Temperature	NL NT
DIVIDED BY NO. OF READINGS	3	NA	MAT Mixed Air Temperature	NL NT
= AVERAGE VELOCITY	232	NA	OAT Enthalpy	NL NT
x LOUVER AREA	8.22	NA	MAT Enthalpy	NL NT
x CORRECTION FACTOR	NA	NA	Economizer Enthalpy Change	NL NT
= TRAVERSE AIRFLOW	1806	NA	TBTU Gain = CFM X 4.5 X Δht	NL NT

VELOCITY TEST READINGS							
READING NUMBER	TEST ONE	TEST TWO	FINAL TEST	READING NUMBER	TEST ONE	TEST TWO	FINAL TEST
1	171			26			
2	260			27			
3	267			28			
4				29			
5				30			
6				31			
7				32			
8				33			
9				34			
10				35			
11				36			
12				37			
13				38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			

REMARKS

DATE:
10/21/2020

PROJECT:

CHELMSFORD
HIGH SCHOOL

SYSTEM:

RTU-3

READING BY:
JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



ECONOMIZER TEST REPORT

ECONOMIZER DATA		SUMMARY	DESIGN	ACTUAL
MANUFACTURER	SEASONS 4	Min. Fresh Air CFM	NL	1313
MODEL	GMJK26-0352-MN7.0-1111SE	Max. Fresh Air CFM	NL	NT
SERIAL	A9308-0806-03	DB TEMPERATURES / BTU GAIN		
LOUVER AREA	1 - 31 X 79.5, 1 - 23.25 X 47.5	RAT Return Air Temperature	NL	NT
ENTHALPY CONTROL?	NO	OAT Outside Air Temperature	NL	NT
FAN POWERED EXHAUST?	YES	MAT Mixed Air Temperature	NL	NT
		Percent of Outside Air	NL	NT
		SBTU Gain = CFM X 1.08 X Δt	NL	NT

CALCULATIONS	MINIMUM	MAXIMUM	WB TEMPERATURES / BTU GAIN	
TOTAL READINGS (FPM)	582	NA	OAT Outside Air Temperature	NL NT
DIVIDED BY NO. OF READINGS	11	NA	MAT Mixed Air Temperature	NL NT
= AVERAGE VELOCITY	53	NA	OAT Enthalpy	NL NT
x LOUVER AREA	24.78	NA	MAT Enthalpy	NL NT
x CORRECTION FACTOR	NA	NA	Economizer Enthalpy Change	NL NT
= TRAVERSE AIRFLOW	1313	NA	TBTU Gain = CFM X 4.5 X Δht	NL NT

VELOCITY TEST READINGS							
READING NUMBER	LOUVER 1	LOUVER 2	FINAL TEST	READING NUMBER	TEST ONE	TEST TWO	FINAL TEST
1	60	0		26			
2	33	31		27			
3	70	0		28			
4	0			29			
5	62			30			
6	103			31			
7	120			32			
8	103			33			
9				34			
10	AVG	AVG		35			
11	69	10		36			
12				37			
13				38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			

REMARKS

ECONOMIZER AT 5%

UNIT WAS RUNNING AT 53 HZ

DATE:
10/21/2020

PROJECT:

CHELMSFORD
HIGH SCHOOL

SYSTEM:

RTU-6

READING BY:
JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

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Pepperell, MA 01463
Phone: 978-925-9383



ECONOMIZER TEST REPORT

ECONOMIZER DATA		SUMMARY	DESIGN	ACTUAL
MANUFACTURER	MCQUAY	Min. Fresh Air CFM	NL	4081
MODEL	RP5045CSA	Max. Fresh Air CFM	NL	NT
SERIAL	FB0U060601640 02	DB TEMPERATURES / BTU GAIN		
LOUVER AREA	(2) 59 X 57.5	RAT Return Air Temperature	NL	NT
ENTHALPY CONTROL?	NO	OAT Outside Air Temperature	NL	NT
FAN POWERED EXHAUST?	YES	MAT Mixed Air Temperature	NL	NT
		Percent of Outside Air	NL	NT
		SBTU Gain = CFM X 1.08 X Δt	NL	NT

CALCULATIONS	MINIMUM	MAXIMUM	WB TEMPERATURES / BTU GAIN	
TOTAL READINGS (FPM)	1732	NA	OAT Outside Air Temperature	NL NT
DIVIDED BY NO. OF READINGS	18	NA	MAT Mixed Air Temperature	NL NT
= AVERAGE VELOCITY	866	NA	OAT Enthalpy	NL NT
x LOUVER AREA	47.12	NA	MAT Enthalpy	NL NT
x CORRECTION FACTOR	NA	NA	Economizer Enthalpy Change	NL NT
= TRAVERSE AIRFLOW	4081	NA	TBTU Gain = CFM X 4.5 X Δht	NL NT

VELOCITY TEST READINGS							
READING NUMBER	LOUVER 1	LOUVER 2	FINAL TEST	READING NUMBER	TEST ONE	TEST TWO	FINAL TEST
1	30	36		26			
2	62	59		27			
3	40	100		28			
4	78	171		29			
5	67	112		30			
6	71	120		31			
7	76	132		32			
8	168	105		33			
9	167	138		34			
10				35			
11				36			
12	AVG	AVG		37			
13	759	973		38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			

REMARKS

ECONOMIZER AT 30%

DATE:
10/21/2020

PROJECT:

CHELMSFORD
HIGH SCHOOL

SYSTEM:

RTU-7

READING BY:
JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

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Pepperell, MA 01463
Phone: 978-925-9383



ECONOMIZER TEST REPORT

ECONOMIZER DATA		SUMMARY	DESIGN	ACTUAL
MANUFACTURER	SEASONS 4	Min. Fresh Air CFM	NL	2526
MODEL	GSPI27-0694-MN12.-15SE	Max. Fresh Air CFM	NL	NT
SERIAL	A9308-0806-04	DB TEMPERATURES / BTU GAIN		
LOUVER AREA	(2) 31.75 X 25.25	RAT Return Air Temperature	NL	NT
ENTHALPY CONTROL?	NO	OAT Outside Air Temperature	NL	NT
FAN POWERED EXHAUST?	YES	MAT Mixed Air Temperature	NL	NT
		Percent of Outside Air	NL	NT
		SBTU Gain = CFM X 1.08 X Δt	NL	NT

CALCULATIONS	MINIMUM	MAXIMUM	WB TEMPERATURES / BTU GAIN	
TOTAL READINGS (FPM)	1819	NA	OAT Outside Air Temperature	NL NT
DIVIDED BY NO. OF READINGS	8	NA	MAT Mixed Air Temperature	NL NT
= AVERAGE VELOCITY	227	NA	OAT Enthalpy	NL NT
x LOUVER AREA	11.13	NA	MAT Enthalpy	NL NT
x CORRECTION FACTOR	NA	NA	Economizer Enthalpy Change	NL NT
= TRAVERSE AIRFLOW	2526	NA	TBTU Gain = CFM X 4.5 X Δht	NL NT

VELOCITY TEST READINGS							
READING NUMBER	LOUVER 1	LOUVER 2	FINAL TEST	READING NUMBER	TEST ONE	TEST TWO	FINAL TEST
1	330	241		26			
2	203	146		27			
3	267	102		28			
4	358	172		29			
5				30			
6				31			
7	AVG	AVG		32			
8	289	165		33			
9				34			
10				35			
11				36			
12				37			
13				38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			

REMARKS

ECONOMIZER AT 10%

DATE:
10/21/2020

PROJECT:

CHELMSFORD
HIGH SCHOOL

SYSTEM:

RTU-8

READING BY:
JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

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Pepperell, MA 01463
Phone: 978-925-9383



ECONOMIZER TEST REPORT

ECONOMIZER DATA		SUMMARY	DESIGN	ACTUAL
MANUFACTURER	MCQUAY	Min. Fresh Air CFM	NL	561
MODEL	RPS025CLA	Max. Fresh Air CFM	NL	NT
SERIAL	FB0U060601639-00	DB TEMPERATURES / BTU GAIN		
LOUVER AREA	(2) 27.5 X 35	RAT Return Air Temperature	NL	NT
ENTHALPY CONTROL?	NO	OAT Outside Air Temperature	NL	NT
FAN POWERED EXHAUST?	YES	MAT Mixed Air Temperature	NL	NT
		Percent of Outside Air	NL	NT
		SBTU Gain = CFM X 1.08 X Δt	NL	NT

CALCULATIONS	MINIMUM	MAXIMUM	WB TEMPERATURES / BTU GAIN	
TOTAL READINGS (FPM)	338	NA	OAT Outside Air Temperature	NL NT
DIVIDED BY NO. OF READINGS	8	NA	MAT Mixed Air Temperature	NL NT
= AVERAGE VELOCITY	42	NA	OAT Enthalpy	NL NT
x LOUVER AREA	13.37	NA	MAT Enthalpy	NL NT
x CORRECTION FACTOR	NA	NA	Economizer Enthalpy Change	NL NT
= TRAVERSE AIRFLOW	561	NA	TBTU Gain = CFM X 4.5 X Δht	NL NT

VELOCITY TEST READINGS							
READING NUMBER	LOUVER 1	LOUVER 2	FINAL TEST	READING NUMBER	TEST ONE	TEST TWO	FINAL TEST
1	75	48		26			
2	62	0		27			
3	31	28		28			
4	27	67		29			
5				30			
6				31			
7	AVG	AVG		32			
8	195	165		33			
9				34			
10				35			
11				36			
12				37			
13				38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			

REMARKS

ECONOMIZER AT 10%

DATE:
10/21/2020

PROJECT:

CHELMSFORD
HIGH SCHOOL

SYSTEM:

RTU-9

READING BY:
JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



ECONOMIZER TEST REPORT

ECONOMIZER DATA		SUMMARY	DESIGN	ACTUAL
MANUFACTURER	McQUAY	Min. Fresh Air CFM	NL	5418
MODEL	RAH047CYA	Max. Fresh Air CFM	NL	NA
SERIAL	FB0U060601638 02	DB TEMPERATURES / BTU GAIN		
LOUVER AREA	(2) 59 X 57.5	RAT Return Air Temperature	NA	NA
ENTHALPY CONTROL?	NO	OAT Outside Air Temperature	NA	NA
FAN POWERED EXHAUST?	YES	MAT Mixed Air Temperature	NA	NA
		Percent of Outside Air	NA	NA
		SBTU Gain = CFM X 1.08 X Δt	NA	NA

CALCULATIONS	MINIMUM	MAXIMUM	WB TEMPERATURES / BTU GAIN	
TOTAL READINGS (FPM)	NL	20.89	OAT Outside Air Temperature	NA
DIVIDED BY NO. OF READINGS	NL	18	MAT Mixed Air Temperature	NA
= AVERAGE VELOCITY	NL	116	OAT Enthalpy	NA
x LOUVER AREA	NL	46.71	MAT Enthalpy	NA
x CORRECTION FACTOR	NL	NA	Economizer Enthalpy Change	NA
= TRAVERSE AIRFLOW	NL	5418	TBTU Gain = CFM X 4.5 X Δht	NA

VELOCITY TEST READINGS							
READING NUMBER	LOUVER 1	LOUVER 2	FINAL TEST	READING NUMBER	TEST ONE	TEST TWO	FINAL TEST
1	43	135		26			
2	25	72		27			
3	0	50		28			
4	113	98		29			
5	55	139		30			
6	0	185		31			
7	116	213		32			
8	223	221		33			
9	249	153		34			
10				35			
11				36			
12				37			
13				38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			

REMARKS

OA Damper is at 50% at time of testing according to BAS

DATE:
10/21/2020

PROJECT:

CHELMSFORD
HIGH SCHOOL

SYSTEM:

RTU-10

READING BY:
JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



ECONOMIZER TEST REPORT

ECONOMIZER DATA		SUMMARY	DESIGN	ACTUAL
MANUFACTURER	McQUAY	Min. Fresh Air CFM	NL	NL
MODEL	RD58000CYA	Max. Fresh Air CFM	NL	5838
SERIAL	FB0U060601643 00	DB TEMPERATURES / BTU GAIN		
LOUVER AREA	(2) 27.5 X 35	RAT Return Air Temperature	NT	NT
ENTHALPY CONTROL?	NO	OAT Outside Air Temperature	NT	NT
FAN POWERED EXHAUST?	YES	MAT Mixed Air Temperature	NT	NT
		Percent of Outside Air	NT	NT
		SBTU Gain = CFM X 1.08 X Δt	NT	NT

CALCULATIONS	MINIMUM	MAXIMUM	WB TEMPERATURES / BTU GAIN	
TOTAL READINGS (FPM)	NA	3499	OAT Outside Air Temperature	NL NT
DIVIDED BY NO. OF READINGS	NA	8	MAT Mixed Air Temperature	NL NT
= AVERAGE VELOCITY	NA	437	OAT Enthalpy	NL NT
x LOUVER AREA	NA	13.36	MAT Enthalpy	NL NT
x CORRECTION FACTOR	NA	NA	Economizer Enthalpy Change	NL NT
= TRAVERSE AIRFLOW	NA	5838	TBTU Gain = CFM X 4.5 X Δht	NL NT

VELOCITY TEST READINGS							
READING NUMBER	LOUVER 1	LOUVER 2	FINAL TEST	READING NUMBER	TEST ONE	TEST TWO	FINAL TEST
1	405	306		26			
2	374	389		27			
3	614	507		28			
4	463	441		29			
5				30			
6				31			
7				32			
8				33			
9				34			
10				35			
11				36			
12				37			
13				38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			

REMARKS

Was read at 100% Economizer

DATE:
10/21/2020

PROJECT:

CHELMSFORD
HIGH SCHOOL

SYSTEM:

RTU-11

READING BY:
JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



ECONOMIZER TEST REPORT

ECONOMIZER DATA		SUMMARY	DESIGN	ACTUAL
MANUFACTURER		Min. Fresh Air CFM	NL	NA
MODEL	50DJ-034-A600DL	Max. Fresh Air CFM	NL	1081
SERIAL	3495F65681	DB TEMPERATURES / BTU GAIN		
LOUVER AREA	19X70	RAT Return Air Temperature	NA	NA
LOUVER AREA 2	19X39.5	OAT Outside Air Temperature	NA	NA
LOUVER AREA 3	19X39.5	MAT Mixed Air Temperature	NA	NA
ENTHALPY CONTROL?	NO	Percent of Outside Air	NA	NA
FAN POWERED EXHAUST?	YES	SBTU Gain = CFM X 1.08 X Δt	NA	NA

CALCULATIONS	MINIMUM	MAXIMUM	WB TEMPERATURES / BTU GAIN	
TOTAL READINGS (FPM)	NL	498	OAT Outside Air Temperature	NA
DIVIDED BY NO. OF READINGS	NL	9	MAT Mixed Air Temperature	NA
= AVERAGE VELOCITY	NL	55	OAT Enthalpy	NA
x LOUVER AREA	NL	19.66	MAT Enthalpy	NA
x CORRECTION FACTOR	NL	NA	Economizer Enthalpy Change	NA
= TRAVERSE AIRFLOW	NL	1081	TBTU Gain = CFM X 4.5 X Δht	NA

VELOCITY TEST READINGS							
READING NUMBER	LOUVER 1	LOUVER 2	LOUVER 3	READING NUMBER	TEST ONE	TEST TWO	FINAL TEST
1	53	25	110	26			
2	72	0	139	27			
3	68			28			
4	31			29			
5	0			30			
6				31			
7				32			
8				33			
9				34			
10				35			
11				36			
12	AVG	AVG	AVG	37			
13	44.8	12.5	179	38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			

REMARKS

DATE:
10/21/2020

PROJECT:

CHELMSFORD
HIGH SCHOOL

SYSTEM:

RTU-17

READING BY:
JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



ECONOMIZER TEST REPORT

ECONOMIZER DATA		SUMMARY	DESIGN	ACTUAL
MANUFACTURER	CARRIER	Min. Fresh Air CFM	NL	180
MODEL	48AJT012NM-671HE	Max. Fresh Air CFM	NL	NT
SERIAL	2306G30921	DB TEMPERATURES / BTU GAIN		
LOUVER AREA	22x31	RAT Return Air Temperature	NA	NA
ENTHALPY CONTROL?	NO	OAT Outside Air Temperature	NA	NA
FAN POWERED EXHAUST?	NO	MAT Mixed Air Temperature	NA	NA
		Percent of Outside Air	NA	NA
		SBTU Gain = CFM X 1.08 X Δt	NA	NA

CALCULATIONS	MINIMUM	MAXIMUM	WB TEMPERATURES / BTU GAIN	
TOTAL READINGS (FPM)	76	NT	OAT Outside Air Temperature	NA
DIVIDED BY NO. OF READINGS	2	NT	MAT Mixed Air Temperature	NA
= AVERAGE VELOCITY	38	NT	OAT Enthalpy	NA
x LOUVER AREA	4.73	NT	MAT Enthalpy	NA
x CORRECTION FACTOR	NA	NT	Economizer Enthalpy Change	NA
= TRAVERSE AIRFLOW	180	NT	TBTU Gain = CFM X 4.5 X Δht	NA

VELOCITY TEST READINGS							
READING NUMBER	LOUVER 1	LOUVER 2	FINAL TEST	READING NUMBER	TEST ONE	TEST TWO	FINAL TEST
1	24			26			
2	52			27			
3				28			
4				29			
5				30			
6				31			
7				32			
8				33			
9				34			
10				35			
11				36			
12				37			
13				38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			

REMARKS

Damper was at 68.5% open during testing

DATE:
10/21/2020

PROJECT:

CHELMSFORD
HIGH SCHOOL

SYSTEM:

RTU-22

READING BY:
JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383





Project:	Chelmsford High School	Project Number:	20-121
Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
Date:	10/20/2020	Mechanical Contractor:	Not Listed
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
	RTU-3							
LECTURE HALL				17009	TOTAL	1786		6.3
LECTURE HALL - SA 1	44	29.1	11	14278	6 X 18	488		
LECTURE HALL - SA 2	21	10	13	2730	6 X 18	422		
LECTURE HALL - SA 3					6 X 18	469		
LECTURE HALL - SA 4					6 X 18	407		
LECTURE HALL - RA					18 X 36	1115		
LECTURE HALL - OA								
LECTURE HALL - EX					NI	0		
HEALTH SUITE	RTU-7 / RH-41							
HEALTH SUITE - SA 1	18.5	13	8	1924	12 X 12	148		4.61
HEALTH SUITE - RA 1					14 X 14	368		
HEALTH SUITE - OA					NI	0		
HEALTH SUITE - EX					NI	0		
NURSE RESTROOM-R- SA	5	4	8	160	NI	0		
NURSE RESTROOM-R- EX					10 X 6	101		
NURSE RESTROOM -L- SA	5	4	8	160	NI	0		
NURSE RESTROOM -L- EX					10 X 6	94		
EXAM 1 - SA	6	10	8	480	6 X 6	32		4
EXAM 1 - EX					NI	0		
EXAM 2 - SA	6	10	8	480	6 X 6	38		4.75
EXAM 2 - EX					NI	0		
EXAM 3 - SA	6	14	8	480	6 X 6	0		0
EXAM 3 - EX					NI	0		
EXAM 4 - SA	6	10	8	480	6 X 6	68		8.5
EXAM 4 - EX					NI	0		
STORAGE - SA	6	14	8	672	NI	0		0
STORAGE - EX					NI	0		
BREAKROOM - SA	13	12	8	1248	10 X 10	90		4.32
BREAKROOM - EX					NI	0		
OFFICE - SA	13	12.5	8	1300	10 X 10	111		5.12
OFFICE - EX					NI	0		
STAFF RESTROOM -L-SA	4	4	8	128	NI	0		
STAFF RESTROOM -L-EX					10 X 6	106		

Remarks:



Project:	Chelmsford High School	Project Number:	20-121
Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
Date:	10/20/2020	Mechanical Contractor:	Not Listed
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
STAFF RESTROOM-R-SA	4		8	160	NI	0		
STAFF RESTROOM-R-EX					10 X 6	90		
CAREER CENTER	RTU-7 / RH-39		TOTAL	16205		715		2.65
CAREER CENTER - SA 1	37	11	9	3663	30 X 5	415		
CARRER CENTER - SA 2	10	11	9	990	30 X 5	300		
	38	28	8	11552				
CARRER CENTER - EX					18 X 18	540		
	RTU-7 / RH-47							
ROOM 224	27	28	10	7560	TOTAL	1061		8.42
ROOM 224 - SA 1					6 X 36	512		
ROOM 224 - SA 2					6 X 36	549		
STUDIO ENTRANCE - SA	10.5	14	8	1176	9 X 9	81		4.13
STUDIO ENTRANCE - EX					18 X 18	102		
STUDIO OFFICE - SA	16	12	8	1536	24 X 24	313		12.22
STUDIO OFFICE - RA					18 X 18	102		
	RTU-7 / RH-36							
ROOM 225 - SA	35	20	9	6300	24 X 5	328		3.12
BOYS LOCKER	RTU-10 / RH-1		TOTAL	15008		1805		7.21
BOYS LOCKER - SA 1	41	42	8	13776	18 X 18	707		
BOYS LOCKER - SA 2	7	22	8	1323	18 X 18	783		
BOYS LOCKER - SA 3					18 X 18	315		
BOYS LOCKER - EX 1					16 X 16	1284		
BOYS LOCKER - EX 2					16 X 16	1535		
BOYS LOCKER - EX 3					16 X 16	1033		
					TOTAL	3852		
TEAM ROOM 1 - SA	22	12	8	2112	18 X 18	899		25.54
TEAM ROOM 1 - EX					16 X 16	1061		
TEAM ROOM 2 - SA	17	22	8	2992	18 X 18	719		14.42
TEAM ROOM 2 - EX					16 X 16	1192		
LOCKER OFFICE - SA	21	10	8	1680	18 X 18	693		24.75
LOCKER OFFICE - EX					16 X 16	812		

Remarks:



Project:	Chelmsford High School	Project Number:	20-121
Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
Date:	10/20/2020	Mechanical Contractor:	Not Listed
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
	RTU-11							
ATHLETIC DIRECTOR - SA	10	13	8	1040	8 X 8	143		11.42
ATHLETIC DIRECTOR - EX					10 X 10	50		
ATHLETIC SECRETARY	14	25	8	2800	TOTAL	568		1.2
ATHLETIC SEC. - SA 1					12 X 12	292		
ATHLETIC SEC. - SA 2					12 X 12	276		
ATHLETIC SEC. - EX					12 X 12	0		
ATHLETIC SEC. RESTROOM - EX	5	10	8	400	10 X 6	20		
	AHU-15							
ROOM 108	31.5	28	9	7938	TOTAL	642		4.85
ROOM 108 - SA 1					6 X 30	284		
ROOM 108 - SA 2					6 X 30	358		
ROOM 108 - RA					NI	0		
ROOM 108 - EX					NI	0		
WOMENS - EX	8	5	8	320	6 X 10	59		
MENS - EX	8	5	8	320	6 X 10	47		
ROOM 108 E - SA	21	11	8	1848	12 X 12	166		5.39
ROOM 108 E - EX					36 X 18	691		
	RTU-17 / RH-17							
ROOM 104	37	24	9	7992	TOTAL	879		6.6
ROOM 104 - SA 1					6 X 36	339		
ROOM 104 - SA 2					6 X 36	540		
ROOM 104 - RA					NI	0		
ROOM 104 - EX					20 X 30	559		
	RTU-17 / RH-16							
ROOM 106	36	21	9	10044	TOTAL	864		5.16
ROOM 106 - SA 1					6 X 36	499		
ROOM 106 - SA 2					6 X 36	365		
ROOM 106 - RA					NI	0		
ROOM 106 - EX					28 X 14	993		

Remarks:



Project:	Chelmsford High School	Project Number:	20-121
Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
Date:	10/20/2020	Mechanical Contractor:	Not Listed
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
	RTU-22							
ROOM 111	40	33	8	10560	TOTAL	1010		5.74
ROOM 111 - SA 1					12 X 12	230		
ROOM 111 - SA 2					12 X 12	227		
ROOM 111 - SA 3					12 X 12	284		
ROOM 111 - SA 4					12 X 12	269		
ROOM 111 - RA					16 X 16	722		
ROOM 111 - EX					NI	0		
ROOM 111 - HOOD					18 X 51	886	SEE HOOD REPORT	
	UV-1		FAN ON MED					
ROOM 117	31	39	9	10881	TOTAL	740		8.53
ROOM 117 - SA 1					6 X 48	349		
ROOM 117 - SA 2					6 X 48	391		
ROOM 117 - RA					NI	0		
ROOM 117 - OA					NI	0		
ROOM 117 - EX					16 X 16	610		
ROOM 117 - HOOD					18 X 51	708	SEE HOOD REPORT	
	UV-1		FAN ON MED					
ROOM 202 - SA	24.5	30.5	9	6725	5 X 62	956		8.53
ROOM 202 - RA					3 X 59	507		
ROOM 202 - OA					NL	449		
ROOM 202 - EX					30 X 12	0		
	UV-1		FAN ON MED.					
ROOM 207 - SA	28	24.5	9	6174	5 X 62	595		5.78
ROOM 207 - RA					3 X 59	378		
ROOM 207 - OA					NL	217		
ROOM 207 - EX					30 X 12	40		
	UV-1		FAN ON HIGH					
ROOM 211 - SA	30.5	24.5	9	6725	5 X 62	0		0
ROOM 211 - RA					3 X 59	0		
ROOM 211 - OA					NL	0		
ROOM 211 - EX					30 X 12	80		
	RH-40							
ROOM 228	21	43	9	6237	TOTAL	365		3.51
ROOM 228 - SA 1					20 X 6	205		
ROOM 228 - SA 2					20 X 6	160		
ROOM 228 - RA					NI	0		
ROOM 228 - EX					18 X 12	212		

Remarks:

HOOD DATA SHEET

DATE:
10/20/2020

PROJECT:

CHELMSFORD HIGH SCHOOL

SYSTEM:

CLASSROOM 111 - FUME HOOD

READING BY:

JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



Room	111		
Hood Size	Width x Height /144 = Total Sq. Ft.		
	18	51	6.38
Hood Number	1		
Location	CLASSROOM		
Hood Type	FUME HOOD		

	Test 1	Test 2	Test 3	Test 4	Test 5	Final FPM
1	137					
2	136					
3	134					
4	147					
5						
6						
7						
8						
9						
10						
11						
12						

Sash Height					
Design FPM					
Average FPM	139				
Design CFM					
Tested CFM	886.125				
% of Design					

HOOD DATA SHEET

DATE:
10/20/2020

PROJECT:

CHELMSFORD HIGH SCHOOL

SYSTEM:

CLASSROOM 117 - FUME HOOD

READING BY:

JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



Room	117		
Hood Size	Width x Height /144 = Total Sq. Ft.		
	18	51	6.38
Hood Number	1		
Location	CLASSROOM		
Hood Type	FUME HOOD		

	Test 1	Test 2	Test 3	Test 4	Test 5	Final FPM
1	114					
2	116					
3	102					
4	112					
5						
6						
7						
8						
9						
10						
11						
12						

Sash Height						
Design FPM						
Average FPM	111					
Design CFM						
Tested CFM	708					
% of Design						



Project:	Chelmsford High School	Project Number:	20-121
Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
Date:	10/20/2020	Mechanical Contractor:	Not Listed
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
	UV-1		FAN ON MED					
ROOM 232 - SA	24.5	30.5	9	6725	5 X 62	853		7.61
ROOM 232 - RA					3 X 59	578		
ROOM 232 - OA					NL	275		
ROOM 232 - EX					30 X 12	76		
	UV-1		FAN NOT RUNNING					
ROOM 238 - SA	30.5	24.5	9	6725	5 X 62	0		0
ROOM 238 - RA					3 X 59	0		
ROOM 238 - OA					NL	0		
ROOM 238 - EX					30 X 12	47		
	UV-1		FAN ON MED					
ROOM 241 - SA	24.5	28	9	6174	5 X 62	956		9.29
ROOM 241 - RA					3 X 59	633		
ROOM 241 - OA					NL	323		
ROOM 241 - EX					30 X 12	38		
	UV-1		FAN ON MED					
ROOM 254 - SA	29.5	25.5	9	6770	6 X 67	617		5.47
ROOM 254 - RA					3 X 90	617		
ROOM 254 - OA					NL	0		
ROOM 254 - EX					14 X 14	1029		
	UV-1		FAN ON MED					
ROOM 255	28.5	39	10.5	11671	TOTAL	879		4.52
ROOM 255 - SA 1					18 X 18	432		
ROOM 255 - SA 2					18 X 18	447		
ROOM 255 - RA					3 X 78	172		
ROOM 255 - OA					NL	275		
ROOM 255 - EX					NI	0		
	UV-1		FAN ON MED					
STUDIO - SA	17	25	9	3825	5 X 62	1061		16.64
STUDIO - RA					3 X 59	353		
STUDIO - OA					NL	708		
STUDIO - EX					NI	0		
STUDIO - CEILING - SA					12 X 12	-41		
STUDIO - CEILING RA					12 X 12	-18		
Remarks:								



Project:	Chelmsford High School	Project Number:	20-121
Location:	200 Richardson Rd. Chelmsford MA	Owner:	City of Chelmsford
Date:	10/20/2020	Mechanical Contractor:	Not Listed
TAB Firm:	Balancing Technologies, Inc.	Certified TAB Technician:	JM & JBM

AIR CHANGES PER HOUR REPORT

Area	Room Width	Room Length	Room Height	Cubic Sq Ft	RGD Size	Actual CFM	Required ACH	Actual ACH
	UV-1		FAN ON LOW					
ROOM 304 - SA	24.5	28	9.5	6517	5 X 62	664		6.11
ROOM 304 - RA					3 X 59	420		
ROOM 304 - OA					NL	244		
ROOM 304 - EX					12 X 30	88		
	UV-1		FAN ON MED					
ROOM 307 - SA	30.5	24.5	9.5	7099	5 X 62	899		7.59
ROOM 307 - RA					3 X 59	598		
ROOM 307 - OA					NL	301		
ROOM 307 - EX					12 X 30	121		
	UV-1		FAN NOT RUNNING					
ROOM 314 - SA	24.5	30.5	9.5	7099	5 X 62	0		
ROOM 314 - RA					3 X 59	0		
ROOM 314 - OA					NL	0		
ROOM 314 - EX					12 X 30	45		
	UV-1		FAN ON MED					
ROOM 320 - SA	42	19.5	9	7371	5 X 62	987		8.03
ROOM 320 - RA					3 X 59	493		
ROOM 320 - OA					NL	494		
ROOM 320 - EX					22 X 22	22		
	UV-1		FAN ON MED					
ROOM 324 - SA	42	21	9	7938	5 X 62	554		4.18
ROOM 324 - RA					3 X 59	198		
ROOM 324 - OA					NL	356		
ROOM 324 - EX					22 X 22	57		
	ZD 3-7							
ROOM 328	41	18	9	6642	TOTAL	365		3.29
ROOM 328 - SA 1					48 X 6	119		
ROOM 328 - SA 2					48 X 6	115		
ROOM 328 - SA 3					48 X 6	131		
ROOM 328 - EX					12 X 24	412		
	UV-1		FAN ON LOW					
ROOM 331 - SA	24.5	30.5	9.5	7099	5 X 62	571		4.83
ROOM 331 - RA					3 X 59	354		
ROOM 331 - OA					NL	217		
ROOM 331 - EX					12 X 30	60		

Remarks:

FACILITIES MANAGER PM SUMMARY

Room	Equipment	Number of Belts	Belt Size	Number of Filters	Filter Size	Filter Type	Merv Rating
ROOM 202	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 207	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 211	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 225	UV - 1	NA	NA	1	16.25X77.5X1	FIBERGLASS	
ROOM 232	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 238	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 241	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 254	UV - 1	NA	NA	1	8X64.5X1	FIBERGLASS	
ROOM 304	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 307	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 314	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 320	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 324	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 331	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 337	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8
ROOM 341	UV - 1	NA	NA	1	9X60.25X2	FIBERGLASS	
ROOF TOP	RTU - 3	NA	NA	4	20x20x2	PLEATED	8
ROOF TOP	RTU - 3	NA	NA	4	16X20X2	PLEATED	8
ROOF TOP	RTU - 6	NA	NA	16	16X25X2	PLEATED	8
ROOF TOP	RTU - 6	NA	NA	16	16X24X4	PLEATED	8
ROOF TOP	RTU - 7	NA	NA	8	24x24x2	PLEATED	8
ROOF TOP	RTU - 7	NA	NA	4	12x24x2	PLEATED	8
ROOF TOP	RTU - 8	NA	NA	16	16X25X2	PLEATED	8
ROOF TOP	RTU - 8	NA	NA	14	16X25X2	PLEATED	8
ROOF TOP	RTU - 8	NA	NA	2	24x24x2	PLEATED	8
ROOF TOP	RTU - 9	NA	NA	4	24x24x2	PLEATED	8
ROOF TOP	RTU - 9	NA	NA	4	12x24x2	PLEATED	8
ROOF TOP	RTU - 9	NA	NA	4	24X24X12	PLEATED	12
ROOF TOP	RTU - 9	NA	NA	4	24X12X12	PLEATED	12
ROOF TOP	RTU - 10	NA	NA	8	24x24x2	PLEATED	8
ROOF TOP	RTU - 10	NA	NA	4	12x24x2	PLEATED	8
ROOF TOP	RTU - 11	NA	NA	4	24x24x2	PLEATED	8
ROOF TOP	RTU - 11	NA	NA	4	12x24x2	PLEATED	8
ROOF TOP	AHU - 15	NA	NA	2	24x24x2	PLEATED	8
ROOF TOP	RTU - 17	NA	NA	12	20X25X2	PLEATED	8
ROOF TOP	RTU - 17	4	3VX670	4	16X20X2	PLEATED	8
ROOF TOP	RTU - 22	1	B48	4	20x20x2	PLEATED	8
STUDIO	UV - 1	NA	NA	1	9X60.25X2	PLEATED	8

REMARKS

DATE:
10/21/2020

PROJECT:

CHELMSFORD
HIGH SCHOOL

SYSTEM:

BELTS AND FILTERS

READING BY:

JM & JBM

JOB NUMBER
20-121

Balancing Technologies, Inc.

20 Mill St Suite 190
Pepperell, MA 01463
Phone: 978-925-9383



Phase		Estimated Cost Range		Estimated Timeline
Service Enhancements				
Phase I	Engineering and Consulting	\$7,500	\$15,000	In Process
Phase I	Mechanical Repairs	\$46,000	\$66,000	In Process
Phase I	Controls Repairs	\$29,000	\$39,000	In Process
TOTAL		\$82,500	\$120,000	
HVAC Assessment				
Phase II	Mechanical Assessment & Repairs	\$127,000	\$180,000	December-January
Phase II	Direct Digital Controls	\$200,000	\$220,000	January-February
Phase II	Testing and Balancing	\$200,000	\$240,000	January-February
TOTAL		\$527,000	\$640,000	
Capital Improvements				
Phase III	Controls Improvement: South Row	\$85,000	\$105,000	Submission to FY22 Capital
Phase III	Controls Improvement: McCarthy	\$180,300	\$210,000	Submission to FY22 Capital
Phase III	Controls Improvement: Center	\$20,000	\$30,000	Submission to FY22 Capital
Phase III	Controls Improvement: Modular Classrooms	\$75,000	\$85,000	Submission to FY22 Capital
Phase III	Other Projects, As Identified	TBD	TBD	TBD
TOTAL		\$360,300	\$430,000	
TOTAL for All Phases		\$969,800	\$1,190,000	

CHELMSFORD PUBLIC SCHOOLS

Memorandum

To: Jay Lang, Ed.D., Superintendent of Schools
Members of the School Committee

From: Joanna Johnson-Collins, Director of Business & Finance

Date: December 9, 2020

Re: FY2021 Recommended Budget Transfers – Lane Changes

I am writing to request one budget transfer for FY2021 at this time.

This budget transfer request is shifting budget funds from the salary reserve lane change account. The FY2021 local budget has one-line item originally totaling \$ 108,985 to account for the lane changes for employees who achieved a higher degree (i.e. Bachelors to Masters). The Committee approved a budget transfer in September for \$ 84,290 transferring funds from this one account to several labor accounts for those employees that achieved the higher degree, leaving a favorable balance of \$ 24,695 in this budget line. This budget transfer is to move additional funds from the one line (account) into one additional labor account number associated with an employee who also earned their lane change increase. After this budget transfer, the salary reserve lane change account will have a favorable variance of \$ 17,697.

From		To		Amount
12305000-51460	SALARY RESERVE LANE CHANGE	12305106	51050	6,998
		Total		6,998

I recommend the school committee vote to approve the FY2021 local operating budget transfer of \$ 6,998 from the salary reserve lane change account to the one labor account as presented.

CHELMSFORD PUBLIC SCHOOLS

Jay Lang, Ed.D., Superintendent

Memorandum

To: Members of the School Committee
From: Jay Lang, Ed.D., Superintendent of Schools
Date: December 12, 2020
Re: CHS Winter Sports Update

Attached please find protocols pertaining to the Winter 2020-21 Athletic Season at Chelmsford High School provided by Athletic Director Dan Hart. I have also attached a joint statement from the MVC superintendent's on agreed-upon tryout and competition start dates. CHS plans to offer boys' and girls' basketball, hockey and ski this season, as well as girls' gymnastics and boys' swimming.

In the event CHS was to implement a fully remote daily school schedule at some point during the season, the school committee would be required to vote on whether sports may continue or should be suspended until in-person learning resumes.

December 7, 2020

We, the school leaders of the Merrimack Valley Conference (MVC), share a common commitment to keeping our students, staff, and community safe during the current health crisis. We also know that the commitment to safety extends beyond the impact of COVID-19, and includes the physical, social, and emotional health of our students. As part of that commitment to student safety, we understand the important role that athletics plays in our students' lives and aim to balance the ability for students to participate athletically with the need to mitigate the impact of COVID-19 in our schools and communities.

On November 20, the Massachusetts Interscholastic Athletic Association (MIAA) Board of Directors voted to approve [sport-specific modifications for the 2020-2021 winter season](#). These modifications include basketball, gymnastics, ice hockey, skiing, and swimming & diving, but do not include wrestling, indoor track, winter cheerleading, and dance, which have been moved to future seasons. The modifications also set a new start date for the winter sports season of December 14, 2020.

As MVC leaders, we have continued our weekly meetings that began in early October, and have developed the following two-phased approach to the upcoming winter season:

Phase I (Practices/Tryouts) - Starts December 14

- The winter sports season for practices/tryouts will begin no earlier than December 14.
- Individual schools will make decisions about the timing for beginning practices/tryouts based upon the local context of each school community.
- Over the four weeks of Phase I, schools will assess the effectiveness of sports modifications and cleaning protocols, as well as the trajectory of the virus, to determine if athletics can proceed to Phase II - Interscholastic Competitions

Phase II (Interscholastic Competitions) - Starts January 11

- Interscholastic competitions can start no earlier than January 11.
- Schedules will be designed, by sport, to minimize the number of schools within a competitive cohort in a given week.
- Spectators will not be permitted to attend any indoor competitions.

We are hopeful that we will be able to continue to have athletics, including interscholastic competitions, among our member schools this winter, and we urge the members of our communities to practice proper health protocols (mask wearing, physical distancing, etc.) so that our student-athletes can have the opportunity to compete.

Sincerely,

Sheldon Berman, Superintendent, Andover Public Schools
Timothy Piwowar, Superintendent, Billerica Public Schools
Christopher Sullivan, President, Central Catholic High School
Jay Lang, Superintendent, Chelmsford Public Schools
Steven Stone, Superintendent, Dracut Public Schools
Margaret Marotta, Superintendent, Haverhill Public Schools
Cynthia Paris, Superintendent, Lawrence Public Schools
Joel D. Boyd, Superintendent, Lowell Public Schools
Brandi Kwong, Superintendent, Methuen Public Schools
Gregg T. Gilligan, Superintendent, North Andover Public Schools
Chris Malone, Superintendent, Tewksbury Public Schools

Daniel Hart, CAA
Athletic Director
hartd@chelmsford.k12.ma.us
(978)251-5111 X5627



Lori Martin
Asst. Athletic Director
martinl@chelmsford.k12.ma.us
(978)251-5111 X5625

CHELMSFORD HIGH SCHOOL ATHLETICS

"Home of the Lions"

CHS ATHLETICS RETURN TO PLAY

On November 20, 2020 the MIAA and the MIAA Covid Task Force approved that Winter High School Athletics could take place for the following sports:

- Boys Basketball
- Girls Basketball
- Gymnastics
- Boys Ice Hockey
- Girls Ice Hockey
- Ski
- Boys Swim and Dive

The following sports could not be held in the Winter but will be moved into different seasons:

- Cheer: Fall 2 or Sandwich Season (2/22 - 4/25)
- Indoor Track (Girls and Boys): Fall 2 or Sandwich Season (2/22 - 4/25)
- Wrestling: Spring Season (4/26 - 7/3)

The MIAA will consist of four seasons for the 20-21 school year. The seasons and their dates are as follows:

Fall Season 9/18/20 - 11/20/20 : Boys XC, Girls XC, Field Hockey, Golf, Boys Soccer, Girls Soccer, Swim and Dive (G), Volleyball (G)

Winter Season 11/30/20 - 2/21/21: Basketball (B), Basketball (G), Gymnastics, Ice Hockey (B), Ice Hockey (G), Ski (B), Ski (G), Swim and Drive (B)

New Season 2/22/21 - 4/25/21 ("Sandwich" Season between Winter and Spring): Cheer, Football, Swim and Dive (G), Volleyball (G)

Spring Season 4/26/21 - 7/3/21: Baseball, Lacrosse (B), Lacrosse (G), Track and Field (B), Track and Field (G), Rugby, Softball, Tennis (B), Tennis (G), Volleyball (B) , Track (B), Track (G), Wrestling

All sports would have to meet predetermined standards set forth by the EEA, DESE, the MIAA and Individual School Districts. Sports will have to meet agreed upon modifications to be allowed to participate in practices and games.

Some sports, deemed high risk, may not be able to meet modification to be able to play. This information will have to be relayed from EEA, DESE, and the MIAA.

Modifications for WINTER SPORTS can be found towards the end of this document.

ATHLETICS PROTOCOLS

In order for players to participate in Athletics at Chelmsford High School they must abide by all safety and procedure protocols on a daily basis. The goal of our Athletic Program is to best minimize risk and exposure to COVID-19. Any player who does not wish to adhere by these policies reserves the right to not participate in Athletics this year. Once the season begins, players who do not follow the guidelines will be removed from the Athletic Program.

1. Registered Athletes

- 1.1. In order to participate in Chelmsford High School Athletics, all students must be registered via our online Registration System which can be found at:
https://www1.mcc.net/OneSource/OSPayer/ePayer_Login.aspx?DID=W%2fomnUnBLYUC0ykET4E89WL0m6%2bUr6YedJj%2bYc%2bfgTTwK05%2bjlmqQ7FggXnQ881i
- 1.2. All Student-Athletes must pay their user fee online to be considered REGISTERED.
- 1.3. Only REGISTERED ATHLETES can attend the Practices/Tryouts and Games of their registered sports. Other students and Staff may not attend practices, games.

2. Physicals

- 2.1. All Athletes must turn in a Physical that has happened in the last 13 months.
- 2.2. Telehealth Physicals will NOT be allowed to participate in Athletics per MIAA Sports Medicine Committee rules.
- 2.3. Athletes can not participate in Athletics without a physical.
- 2.4. Physicals can be emailed to CHS Athletic Trainer Kate Chagnon at:
ChagnonK@chelmsford.k12.ma.us

3. Attendance

- 3.1. All Athletes must attend all classes either remote or in person in order to participate in practice or a game for that given day.
- 3.2. Students who do not attend Class Sessions (in either form) on Friday are not allowed to participate in any athletics over the weekend.

4. Practice

- 4.1. Athletes must arrive to every practice and game dressed in their appropriate equipment.
- 4.2. There will be **no use of locker rooms**.
- 4.3. No students will be allowed to enter the building or congregate in or around the building.
- 4.4. Exception: Sports that meet indoors.
 - 4.4.1. These sports will have a designated entry and exit door.
 - 4.4.2. Indoor sports will NOT have use of locker rooms.
- 4.5. All Athletes must be dropped off and picked up on time.

- 4.5.1. Coaches will waive kids into practices/games. They will enter through the predetermined entrance and leave via the predetermined exits.
 - 4.5.2. Players can not hang around after practice. Players and parents can not congregate in the parking lot after practices.
5. **Bathroom Use:** Students will use the closest bathroom to their playing area. Everyone is encouraged to use the bathroom before their practice or game and to only enter the Bathrooms on site for emergency use.
 - 5.1. Only One (1) person should be in the bathroom at a time.
 - 5.2. Anyone using a bathroom MUST WASH THEIR HANDS before returning.
6. **Masks/Face Coverings:** Coaches and Athletes should wear face covering that loop around the ears. **Gaiters or bandanas will not be permitted.**
 - 6.1. Coaches: All Coaches are required to wear a mask at all times during practices, games, or in any team activity, meeting, or walking to or from the parking lot to the field..
 - 6.2. Athletes: Must wear a mask from the time they leave their car to the time they step on the field - NO EXCEPTIONS.
 - 6.2.1. All Athletes must keep an additional mask on hand.
 - 6.2.2. Masks should go on during Team Talks, Strategy Sessions, or Rest Periods.
 - 6.2.3. Athletes without a mask, or who refuse to wear a mask will not be allowed to participate and must be picked up by the parent/guardian immediately.
 - 6.2.4. Athletes who wear their masks incorrectly (around their chin, not covering the nose) will be removed from play.
 - 6.2.5. Athletes are encouraged to wash/disinfect their masks each day so that they have a "clean" mask for participation. If wearing a disposable mask, please wear a new one each day.
7. **Hand Washing/Sanitizer:** Athletes should practice proper hand washing techniques at all times and should wash their hands before participating in any athletic activity.
 - 7.1. Hand Washing: Athletes must wash their hands for a minimum of 20 seconds after using the bathroom.
 - 7.2. Sanitizer: Athletes must sanitize frequently during practices and games.
 - 7.2.1. Sanitizer Stations will be available through the Athletic Department, but athletes are encouraged to bring their own personal bottles just in case.
 - 7.3. Drinks: Students are to bring their own drinks and each bottle should be labeled. Players should put their drinks and belongings in their own area, and everyone's items should be 10 feet from each other.
 - 7.3.1. NO SHARING OF DRINKS

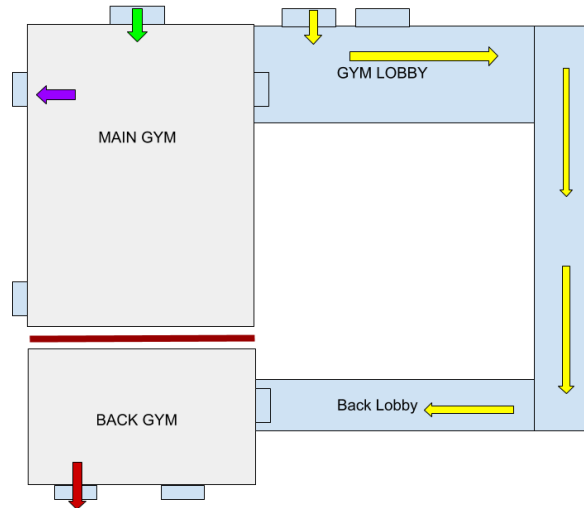
8. **Illness: All Athletes that do not feel well should not attend school or practice/game sessions.** Attending a game or practice when you are sick could result in the team and the town you are playing being quarantined.
 - 8.1. If you are experiencing any symptoms of illness please notify the school nurse.
 - 8.2. If you are experiencing COVID symptoms you should self-quarantine and call your physician immediately.
 - 8.3. If Athletes/Students are out for COVID-19 (positive test, or suspected) they must be quarantined for a period of 14 days and can not return until they are fever free and symptom free and have received approval to return from Physician, School, Board of Health. (Could be updated/change upon Chelmsford Public Schools or Chelmsford Board of Health policy updates)
9. **Transportation:** There have been COVID-19 Protocols put in place for transportation.
 - 9.1. School Bus Capacity: 25 Passengers (Plus Driver) is the limit for riding the large passenger school bus.
 - 9.2. CPS Multi-Activity Van Capacity: 6 Person Maximum (Plus Driver)
 - 9.3. When taking transportation: All players must be masked upon entry and exit of the bus.
 - 9.4. Masks Must remain on during the duration of the trip.
 - 9.5. Students are to follow DESE Transportation Protocol for sitting (Every other row, staggered seating.)
 - 9.6. Siblings can sit together on the bus.
 - 9.7. It is encouraged that players crack the windows open for the bus to allow air flow and wear the appropriate clothing for those conditions (i.e. sweatshirt, hats, etc.)
 - 9.8. Self-Transportation: For this school year, Individual Players may drive themselves (with siblings) to games IF the parents have completed the ALTERNATE TRANSPORTATION FORM. Students can not drive other teammates to games. (Carpooling is not advised as it could lead to a quarantine situation for all in the car)
 - 9.9. Parent Transportation: Players may be driven to games by their parents. In order for this to occur, parents must have completed an ALTERNATE TRANSPORTATION FORM.
 - 9.10. Students are not to eat on the bus, or share any items (snacks, drinks, phones, headphones, etc.)
 - 9.11. Students should not yell, sing, scream or talk in close contact with anyone to prevent the spread of aerosols/droplets that could result in the spread of COVID-19.
 - 9.12. Students must sit in assigned seats on the bus. The same seat you ride in to the game will be the same seat you ride home in from the game. Assigned seats should be kept for the entire season.
 - 9.13. Students are permitted to travel home with their parents/guardians (only) if they took transportation to the game. They must inform the coach, and the parents must inform the coach of this in writing (email from parent) prior to boarding the bus. (Exception: Emergency Situations)

10. **SPECTATORS:** Spectators will not be allowed to attend practices or games for the Winter 20' - 21' season.
 - 10.1. IF a spectator enters the practice facility, or attempts to enter during a game the practice or contest will be stopped and play will not continue until that spectator has left the facility.
 - 10.2. Failure to comply with School Officials will result in Police Involvement.

11. **SCHEDULE FORMAT:** For the Winter Season teams Chelmsford will only compete against teams within the Merrimack Valley Conference.
 - 11.1. Chelmsford will participate against one school each week.
 - 11.1.1. Exception: Girls Ice Hockey
 - 11.2. Teams that play twice during the week will have contests locations divided up fairly between two schools.
 - 11.3. Subvarsity Teams will practice/play during the week (Monday - Friday). There will be no weekend practices for Sub Varsity Sports.
 - 11.3.1. Exception: Girls Ice Hockey
 - 11.3.2. Exception: Hockey games may be on the weekends.
 - 11.3.3. Exception: Games Rescheduled due to snow.
 - 11.3.4. All games and practices will be scheduled around both towns academic schedules.

12. **FACILITY DROP OFF/PICK UP**
 - 12.1. Entry and Exit must be done in a way that athletes are not entering in a congested manner or mixing with other teams. Players must wait for coaches to signal them in. Please follow the entry/exit guidelines for facilities.
 - 12.1.1. **Chelmsford Forum:**
 - 12.1.1.1. FIRST GROUP (Varsity)Entry through main entrance doors (Near Ticket Booth). Exit through side doors behind the home bench.
 - 12.1.1.2. SECOND GROUP(JV/GIRLS): Enter By Doors on Bathroom Side. EXIT side doors behind the visiting bench.
 - 12.1.1.3. THIRD GROUP (JV/GIRLS): Entry through main entrance doors (Near Ticket Booth). Exit through side doors behind the home bench.
 - 12.1.2. **McCarthy Middle School:** (No One is allowed anywhere in the school, but the gym. No one allowed in building until waived in by coach)
 - 12.1.2.1. First Practice of each day or Game: Enter and Exit through Small Gym Side Doors (Police Station Side)
 - 12.1.2.2. Second Practice of each day or Game: Enter and Exit through Cafeteria Side Doors.
 - 12.1.3. **Chelmsford High School Gym:**

- 12.1.3.1. **FRONT GYM:** ENTER through Center Door #17 next to the scoreboard. EXIT through side door #16.
- 12.1.3.2. **BACK GYM:** ENTER through Gym Lobby Doors and walk down Locker Room Hallway, Enter Gym through Back Gym Doors near the Athletic Office (See Diagram). EXIT through back gym Door #14. *(Parent Pick Up for Back Gym Practices should be near the back gym next to the track in spots with wooden guard rail. Parents can not park or pick up in the back lot near the gym. Those are reserved spots.)*



- 12.2. **Lowell YMCA:** ENTRY through front doors of YMCA. EXIT through Back Pool Doors.
- 12.3. Absolute Gymnastics, Hallenborg Ice Rink, Nashoba Valley Ski Area: Coaches will give facility specific directions to teams.

MIAA INDIVIDUAL SPORT MODIFICATIONS

Please click the link to be directed to the MIAA Modification Documents.

Basketball:

http://www.miaa.net/gen/miaa_generated_bin/documents/basic_module/Basketball_Modifications_Winter_2020.pdf

Gymnastics:

http://www.miaa.net/gen/miaa_generated_bin/documents/basic_module/Gymnastics_Modifications_Winter_2020.pdf

Ice Hockey:

http://www.miaa.net/gen/miaa_generated_bin/documents/basic_module/Ice_Hockey_Modifications_Winter_2020.pdf

Ski:

http://www.miaa.net/gen/miaa_generated_bin/documents/basic_module/Alpine_Ski_Modifications_Winter_2020.pdf

Swim:

http://www.miaa.net/gen/miaa_generated_bin/documents/basic_module/Swimming_Diving_Modifications_Winter_2020.pdf

CHELMSFORD PUBLIC SCHOOLS

Memorandum

To: Members of the School Committee

From: Jay Lang, Ed.D., Superintendent of Schools

Date: December 4, 2020

Re: Acceptance of Donation

The Fichtenbaum Family would like to donate \$6,000 to the Chelmsford Public Schools. This donation is designed to meet the district's goal of developing and maintaining creative and innovative opportunities for students in the STEM fields. Mr. Fichtenbaum contacted Mr. Jonathan Morris, the K-12 Science Coordinator, to see if the school district would be interested in funds to purchase equipment and supplies geared towards STEM education. Mr. Morris determined supplies and equipment best suited towards creating a "Makerspace" at Parker Middle School. Attached please find a list of the equipment and supplies Mr. Morris would like to purchase for the school district.

The Fichtenbaum Family places a high value in education and find it fulfilling to contribute to the continuation of excellence from Chelmsford Public Schools.

Suggested motion:

A motion to approve the donation / gift of \$ 6,000 from the Fichtenbaum Family as presented in the spreadsheet for purchases provided by Mr. Morris.

Parker Makerspace - Item List

DESCRIPTION	#	PRICE	TOTAL
Cricut Maker - White	1	\$500.00	\$500
Hyperduino Mini Maker Kit	1	\$600.00	\$600
LittleBits STEAM student set	1	\$300.00	\$300
Littlebits STEAM Expansion Pack	1	\$1,500.00	\$1,500
Singer HD Sewing Machine	1	\$250.00	\$250
Kiwi - 10 pack draw bot	1	\$125.00	\$125
Kiwi - 10 pack animation	1	\$125.00	\$125
Kiwi - 10 pack mechanical claw	1	\$150.00	\$150
Basic Pliers Set	2	\$20.00	\$40
Allen Wrench set	1	\$15.00	\$15
Cardboard Cutting Tool	3	\$37.00	\$111
Screwdriver set	6	\$10.00	\$60
Safety Goggles	25	\$2.00	\$50
Storage Ssystem for consumables	1	\$600.00	\$600
Mobile Craft Cart	1	\$300.00	\$300
Transparent Tape	50	\$3.00	\$150
Glue sticks	2	\$65.00	\$130
Glue gun	10	\$11.00	\$110
Assorted Pipe Cleaners	5	\$2.00	\$10
Assorted Fabrics	1	\$100.00	\$100
Assorted threads	1	\$100.00	\$100
Assorted Craft visuals	1	\$13.00	\$13
Set of 12 dry erase markers	10	\$22.00	\$220
craft foam - 40 pieces	1	\$50.00	\$50
Assorted paper materials	10	\$3.00	\$30
12 pack of scissors	2	\$22.00	\$44
Assorted Adhesive Vinyl	1	\$17.00	\$17
<i>Estimate Shipping Costs</i>	1	\$300.00	\$300
Total			\$6,000



CHELMSFORD PUBLIC SCHOOLS

Dr. Linda Hirsch, Assistant Superintendent

MEMORANDUM

To: Dr. Jay Lang, Superintendent
Members of the Chelmsford School Committee

From: Dr. Linda Hirsch, Assistant Superintendent *Linda Hirsch*

Date: December 15, 2020

RE: Update - School Testing

In the last testing update, the MCAS 2021 *Spring Testing Schedule* was presented with the current Juniors (Class of 2022) taking their missed MCAS test from the spring of 2020 this January, 2021. Since that announcement and in recognition of the scheduling and logistical challenges that schools and districts are experiencing, the MA Department of Elementary and Secondary Education (DESE) is adjusting the schedules and expectations for MCAS high school testing and ACCESS testing as follows:

January-February High School MCAS ELA and Mathematics Tests:

- Students in grade 11 (class of 2022) **will no longer participate in testing** during the January-February window. Testing for this class in English language arts and mathematics is being postponed until later in the year.
- Students in grade 12 (class of 2021), as well as adult test-takers, **will remain eligible to participate** in one or both tests beginning in January to earn their Competency Determination.
- The testing window for eligible students is extended through Friday, February 12, giving schools an additional week to complete testing. The full testing window will be **Thursday, January 14 through February 12**.

ACCESS for ELLs:

- The testing window for the ACCESS tests is being extended for several months. Schools will be able to administer the ACCESS tests at any time between **Thursday, January 7 and Thursday, May 20**.
- Results will be returned in late summer.

Although the ACCESS testing for ELL students has been extended, we will continue with our current testing schedule districtwide for all ELL students beginning in January. The rationale to keep the January testing for ACCESS is two-fold. First, ELL students and families have already been notified about the testing and plans were created for students to come to school to test. Also, it is important that we avoid any duplicate testing windows for MCAS in the spring, as students in grades 3-12 are required to take the MCAS test.

With the change in MCAS testing for our current 11th grade students, we are now able to offer PSAT testing on January 26, 2021, since there will no longer be an overlap. This is excellent news for our students and families that are in the midst of the college application and planning process at this time. Principal Murray has contacted the *College Board* with the request to test and is awaiting confirmation from the *College Board*. Once testing has been confirmed, information will be sent to students and families about next steps.

The [statewide testing schedule](#) will be updated in the near future to reflect the changes indicated above and DESE will provide more information in the coming weeks about testing schedules for the remainder of the school year.



CHELMSFORD PUBLIC SCHOOLS

Jay Lang, Ed.D., Superintendent

Memorandum

To: Members of the School Committee
From: Jay Lang, Ed.D., Superintendent of Schools
Date: December 12, 2020
Re: FY2022 Capital Plan Update

This item is a placeholder for the FY2022 Capital Planning Committee in the event further action/recommendation on behalf of the school committee is required.

CHELMSFORD PUBLIC SCHOOLS

Office of Human Resources
230 North Road, Chelmsford, MA 01824
Telephone: (978) 251-5100 Fax: (978) 251-5110

TO: Dr. Jay Lang, Superintendent

FROM: Dr. Cheryl Kirkpatrick, Director of Personnel and Professional Learning

DATE: December 10, 2020

RE: **Personnel Report November 2020**

Please see the attached Personnel Report which includes retirements, resignations, new hires and assignment changes. Thank you for sharing this report with members of the Chelmsford School Committee.

Personnel Report - November 2020

New Hires

Avila, Kristopher

Paraprofessional

McCarthy Middle School

Effective date: 11/09/2020

Benjamin, Kristen

MCAS Clerk

Chelmsford High School

Effective date: 11/30/20

Crawford, Dani

Paraprofessional

Parker Middle School

Effective date: 11/23/20

Farnping, Jennifer

ABA Paraprofessional

Byam Elementary School

Effective date: 11/16/20

Gonyea, Robin

Lunch/Recess Aide

Harrington Elementary School

Effective date: 11/16/2020

Grossman, Stephanie

Interim Kindergarten Teacher

South Row Elementary School

Effective date: 11/02/20

Jack, Peter

Paraprofessional

Chelmsford High School

Effective date: 11/30/20

Lyons, J Reid

Paraprofessional

Chelmsford High School

Effective date: 11/23/20

Maine, Linda

Lunch/Recess Aide

Harrington Elementary School

Effective date: 11/09/2020

Marcoux, Jason

ICTS Computer Technician

Central Administration

Effective date: 11/09/2020

Murphy, Deborah

Paraprofessional

Byam Elementary School

Effective date: 11/2/20

O'Donnell, Christopher

Communications and Media Director

Central Office

Effective date: 11/02/20

Prees, Evan

Paraprofessional

Byam Elementary School

Effective date: 11/23/20

Viswanatha, Kamala

Paraprofessional

McCarthy Middle School

Effective date: 11/09/20

Resignations:

Conte, Catherine

Paraprofessional

Byam Elementary School

Effective: 11/13/20

Errgong-Weider, Megan

Music Teacher

Center Elementary School

Effective date: 11/25/20

Juhola, Paige

Lunch/Recess Aide

Harrington Elementary School

Effective date: 11/20/20

Taft, Kelly

Paraprofessional

Chelmsford High School

Effective date: 11/25/20

Tolles, Brian

**ABA Paraprofessional
Byam Elementary School
Effective date: 11/25/20**

Retirements:

Zukowski, David

**Substitute Coordinator
Chelmsford High School
Effective date: 11/06/20**

Assignment Changes:

Kutuva-Jayaram, Ranimai (formerly Lunch/Recess Aide at Parker Middle School)

**Paraprofessional
Parker Middle School
Effective date: 11/02/2020**

Monahan, Megan (formerly Paraprofessional at South Row Elementary School)

**Special Education Teacher
South Row Elementary School
Effective date: 11/23/20**

Pintal, Kathleen (formerly Lunch/Recess Aide at Parker Middle School)

**Paraprofessional
South Row Elementary School
Effective date: 11/02/2020**

Valley Collaborative 2020 Annual Report



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General Information

Name of the collaborative: Valley Collaborative

Contact Information

Address:

25 Linnell Circle
Billerica, MA 01821

Phone:

978-528-7800

Website: www.valleycollaborative.org

Academic and fiscal year: 2019-2020 – FY'20

Valley Collaborative's Mission Statement:

To work collaboratively to create a structured learning environment that empowers individuals to lifelong learning and to navigate confidently and with optimal independence in their communities.

Valley Collaborative's Vision:

Valley Collaborative partners with families, districts, and the community to provide innovative programming that empowers students and adults to discover their individual strengths, interests, and abilities. In doing so, students become responsible contributing members of society.

Summary of Successes and Challenges

Message from Executive Director:

It is with great respect that I send this communication to you. We have experienced a very unprecedented time, filled with civil unrest and a wave of surprising and disturbing events around every corner. Dr. Anthony Fauci's name became well known in all of our homes. Given recent developments in the medical community, there is hope that this dark chapter may soon be behind us.

While this year has been filled with more than its fair share of challenges, there is much to be thankful for at Valley. I would be remiss if I did not highlight the extraordinary amount of care each and every staff at Valley pour into their work, from developing and implementing our remote learning plans this March engaging our students/DDS and MRC supported individuals to the physical reopening of all Valley buildings. I, along with Valley's Board of Directors, am in awe of the dedication shown by staff to elicit the best possible outcome for those that they serve during the height of this pandemic.

In spite of the worldwide pandemic, Valley Collaborative's FY'20 school year was very successful programmatically and financially.

- The financial position of the Collaborative remains very strong. The total assets at June 30, 2020 were \$21,410,809 (unaudited). This includes \$4,266,767 (unaudited) held in the OPEB Trust at June 30, 2020.
- Capital fund was fully funded \$1.5 million in FY'20.
- Change in net assets from operations in FY'20 was approximately \$1,262,904.
- The Collaborative's cash position remains solid with over \$11.6 million (\$5.8 million unrestricted and \$4.3 million OPEB restricted) in cash and cash equivalents. This is the result of strong Board oversight, solid financial management, proper billing and collections of receivables.
- In the spirit of continuous improvement, the Collaborative made capital purchases of \$1,670,131 in FY'20 for Vehicles, Furniture, Technology and Improvements. This also includes the \$1 million in improvements for the Valley Elementary School.
- The member districts in FY'20 will have received a total of \$2,000,000 due to the collaborative cumulative surplus formula.
- Revenue for our adult program was at the highest ever totaling almost \$2.9 million. This increase in revenue created a surplus of approximately \$625,000 before administrative allocation.

Due to the unique relationships between students/DDS and MRC supported Individuals and staff, as well as staff and administration, Valley has been able to cultivate a culture of care as highlighted in the most recent staff survey results. Some of the highlights from this survey include:

- 95% of staff feel that Valley Collaborative is student focused. I am proud of Valley's priorities.
- 79% of staff reported feeling supported by their administrators. We value an open-door policy with honest, transparent communication and have salary schedules that compete in the local market as well as a premier benefits package through the GIC.
- 83% of staff reported that teamwork and collaboration are things their school does well. During this pandemic, Valley has been able to allow staff to focus on one's own family by providing the ability to work remotely and grant leaves in order to accommodate personal circumstances. We at Valley believe our amazing staff and all the support we receive from families and the school districts we serve are the keys to our success.
- 77% of staff reported feeling a sense of belonging to their school community. I have witnessed the staff in each of Valley's many different programs become family.
- When asked, "How do you feel about the overall morale/culture at our school?" staff responded:
 - "Excellent! The kids and staff as a community really benefit from events like Thanksgiving lunch here at Linnell and the Halloween dance at the Elementary school. Those events create different opportunities for building better relationships."
 - "I feel that the staff are dedicated, kind hearted, and team orientated. The culture seems accepting and open, patient and respectful to all – both staff/administration and students. I feel that it is prioritized by management."

- “Love the team atmosphere at Valley.”

Thank you for taking the time to read our Annual Report and for your support of Valley Collaborative. If you ever have a suggestion or need assistance, my door is always open.

My best to you always,
Chris A. Scott
Executive Director
Valley Collaborative

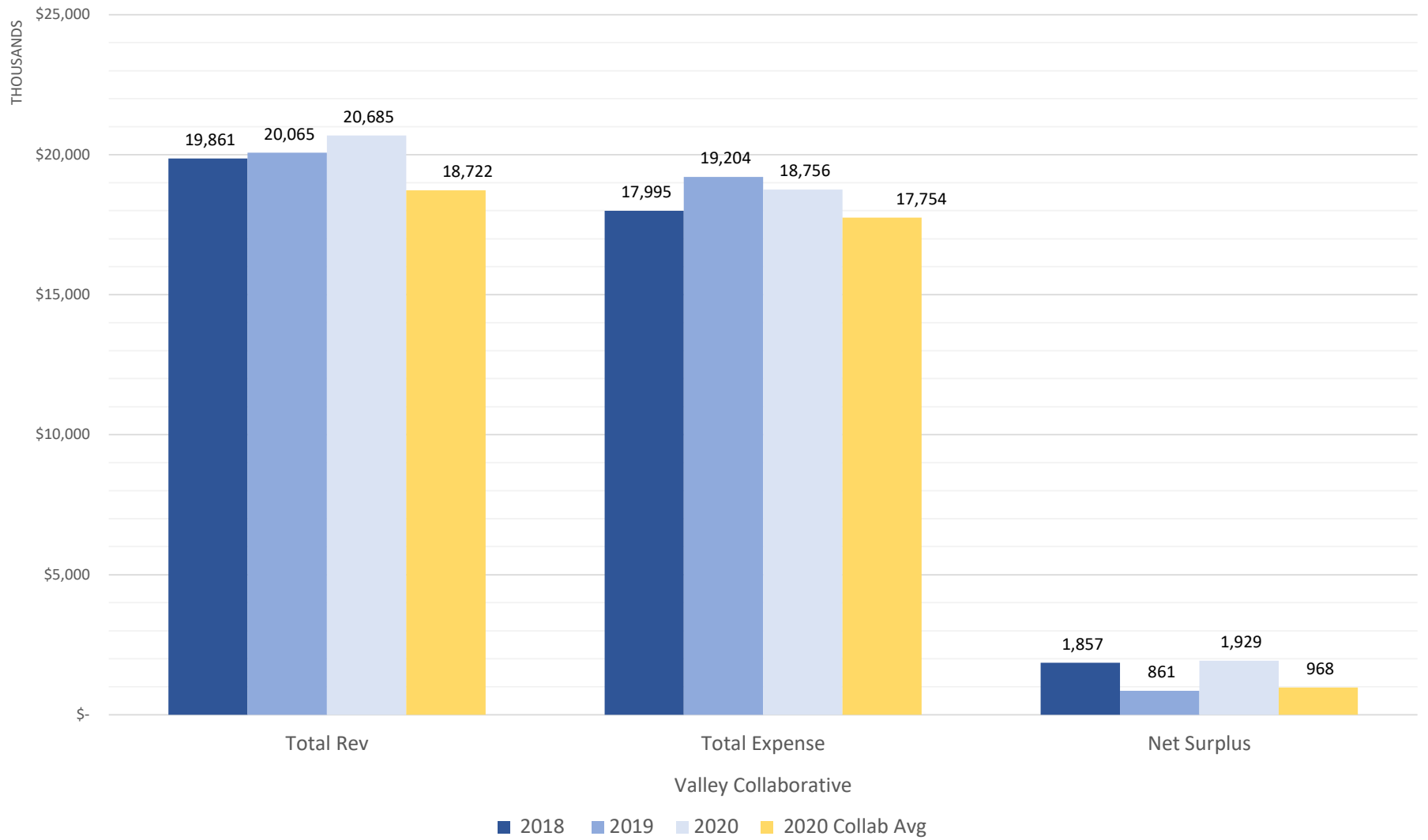
Valley Collaborative

Summary of Financial Activity

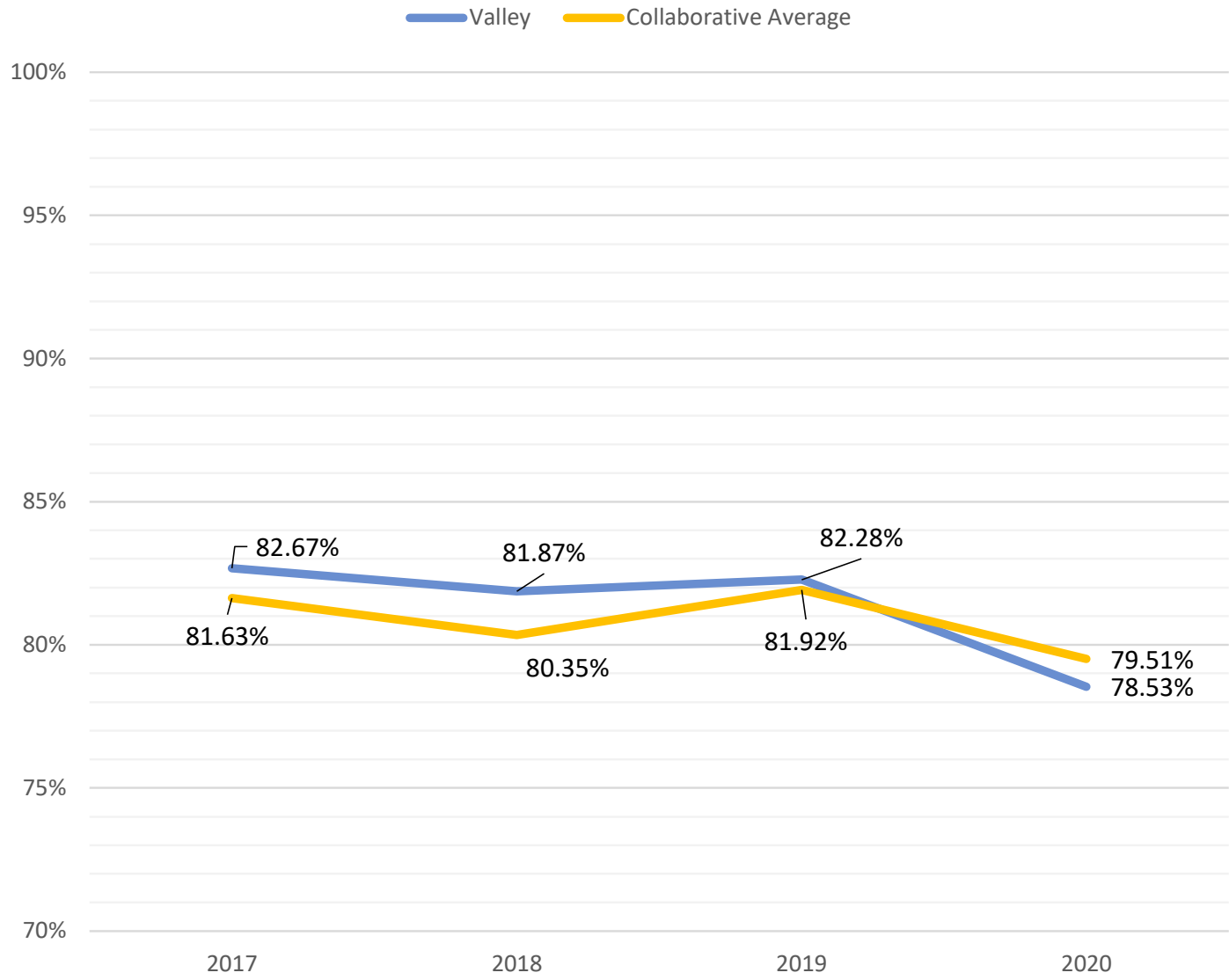
For the year ended June 30, 2020

General Fund Activities

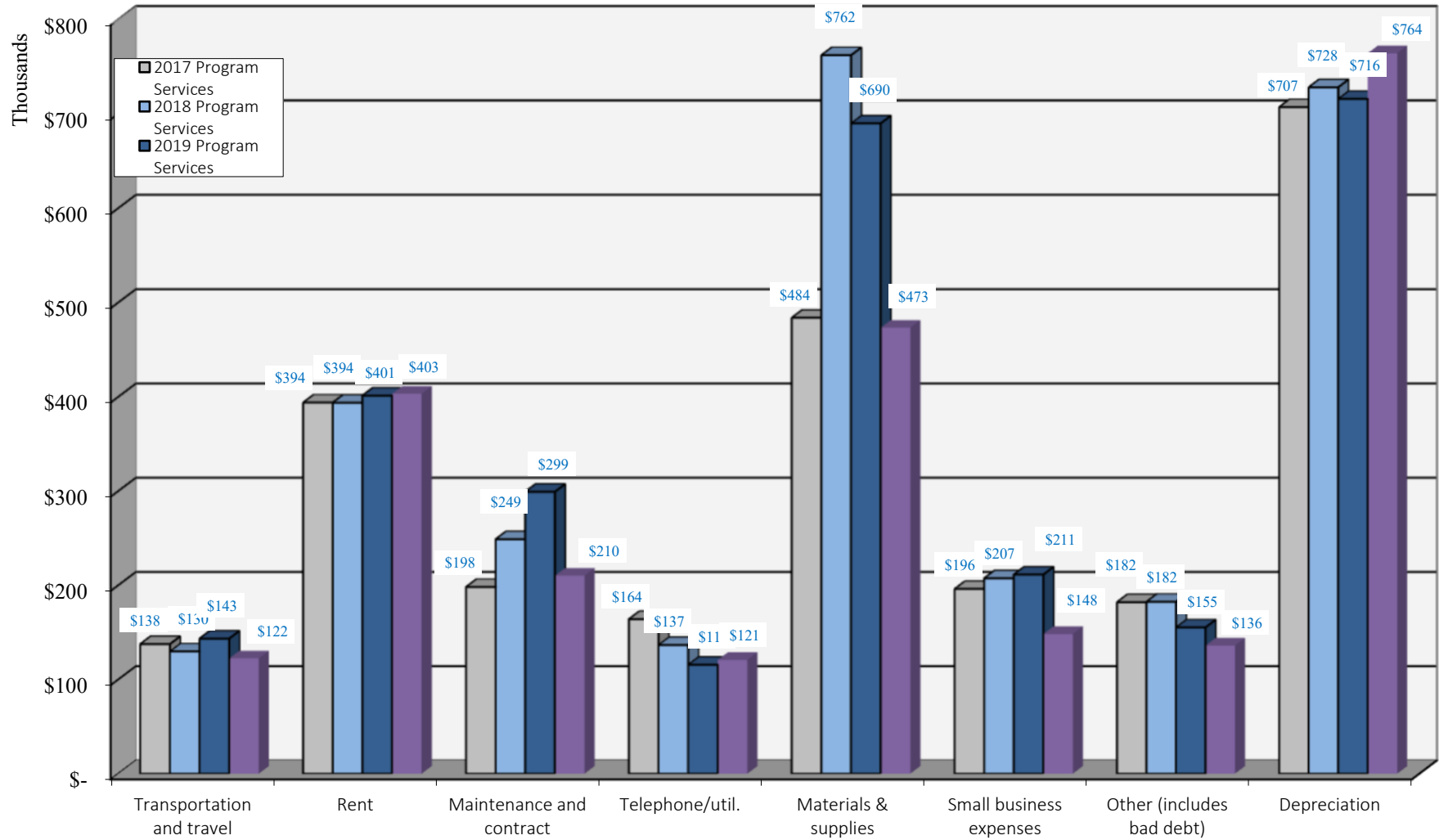
(Excludes Transportation and On-Behalf)



Personnel Expense as a Percentage of Total Expense



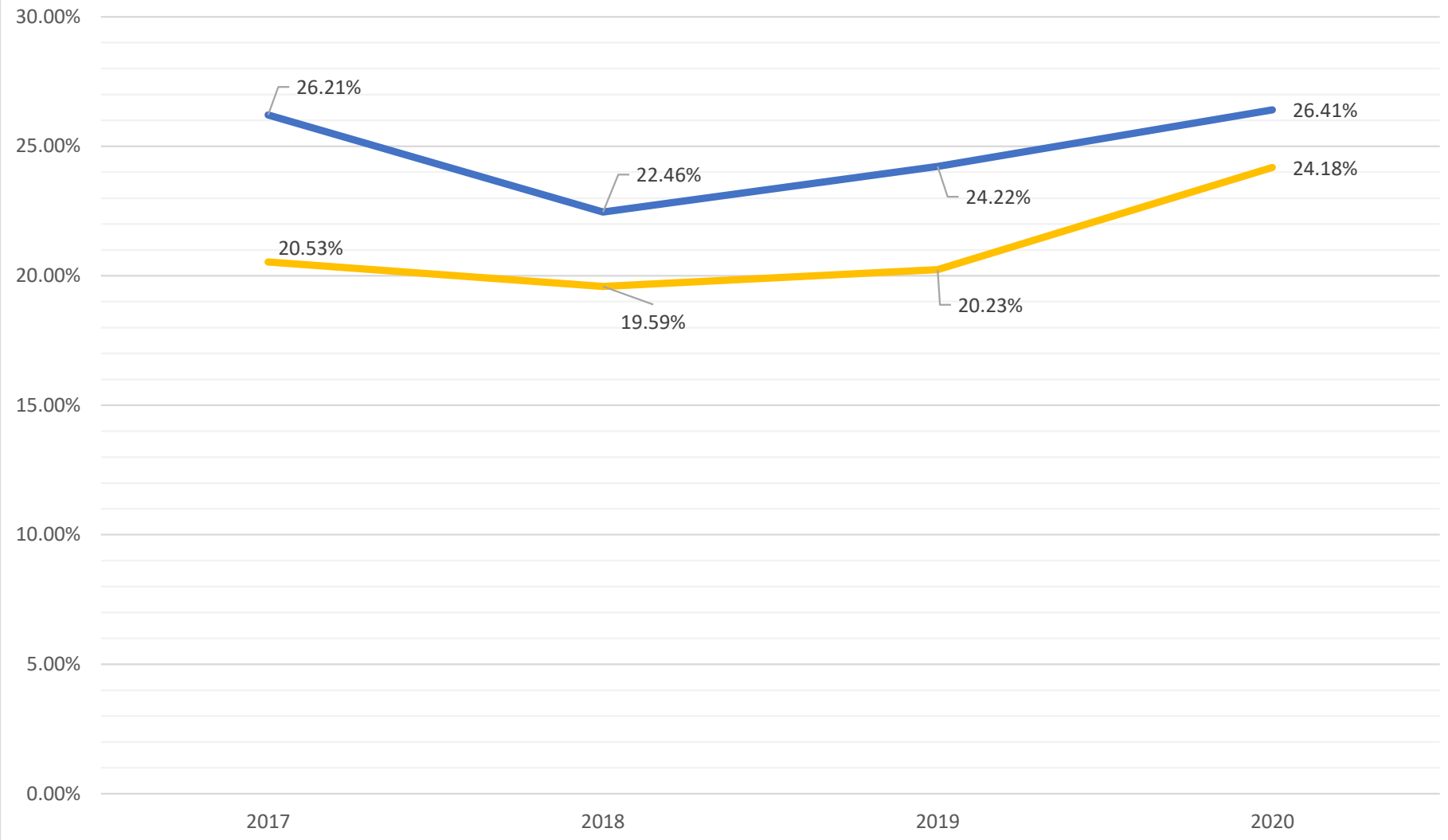
Program Expense Comparison (Excludes Payroll)



Derived from audited financial statements for discussion purposes only.

General Fund Surplus

Valley Collaborative Average



Programming Excellence

Our educational offerings continue to be celebrated throughout the region for being of the highest quality and the most reasonably priced. Our enriched programmatic offerings include:

- Enhanced sensory regulation equipment
- Our greenhouse located at the elementary school serves as an outdoor classroom engaging our students in STEM activities aligned with the science standards
- A robust experiential physical education program
- Community based learning opportunities
- Dual enrollment program with Middlesex Community College
- An afterschool recreational program
- State-of-the-art STEM technology to engage students in the curriculum
- Numerous vocational partnerships with local businesses and corporations

Change(s) in Membership, Services, or Programs

None

Number of Years the Collaborative has been in Existence

Valley Collaborative was founded in 1976. It has been in existence for 44 years.

Revenue and Expenditure Information for the Subject Year

Please see full financial audit posted on the website for details.

Valley Collaborative
Statement of Net Position
June 30, 2020

Assets

Current Assets	
Cash and cash equivalents	\$ 7,327,503
Accounts receivable, net	1,441,379
Prepaid expenses and other assets	37,583
Total Current Assets	8,806,465
Non-current Assets	
Furniture, equipment, vehicles and leasehold improvements, net	8,335,554
Total Non-current Assets	8,335,554
Total Assets	17,142,019

Deferred Outflows of Resources

Deferred Outflows of Resources Related to OPEB	1,914,061
Total Assets and Deferred Outflows of Resources	\$ 19,056,080

Liabilities, Deferred Inflows and Net Position

Current Liabilities	
Accounts payable and accrued liabilities	\$ 879,854
Credits due to member districts	1,400,265
Total Current Liabilities	2,280,119
Non-current Liabilities	
Net OPEB liability	3,054,714
Total Non-current Liabilities	3,054,714
Total Liabilities	5,334,833

Deferred Inflows of Resources

Deferred Inflows of Resources Related to OPEB	1,235,164
---	-----------

Net Position

Net Position	
Unrestricted	2,630,102
Restricted - contributions and other	20,427
Restricted - capital reserve fund	1,500,000
Invested in capital assets, net of related debt	8,335,554
Total Net Position	12,486,083
Total Liabilities, Deferred Inflows and Net Position	\$ 19,056,080

See accompanying notes to financial statements and independent auditor's report.

Valley Collaborative
Statement of Activities
For the year ended June 30, 2020

Functions/ Programs	Program Revenues			Net (Expense) Revenue and Changes in Net Position
	Expenses	Charges for Services	Operating Grants and Contributions	
Governmental Activities:				
Administration	\$ 1,842,248	\$ -	\$ -	\$ (1,842,248)
Education	15,246,335	17,728,460	2,943,191	5,425,316
Intergovernmental revenue and expense	5,009,654	-	5,009,654	-
Other postemployment benefits	918,812	-	-	(918,812)
Depreciation and amortization	764,095	-	-	(764,095)
Total Governmental Activities	\$ 23,781,144	\$ 17,728,460	\$ 7,952,845	\$ 1,900,161
General Revenue and Other:				
Interest				28,958
Other				2,802
Gain on disposal of assets				73,500
Credits to member districts				(1,400,000)
Total General Revenue and Other				(1,294,740)
Change in Net Position				605,421
Net Position, Beginning of Year				11,880,662
Net Position, End of Year				\$ 12,486,083

See accompanying notes to financial statements and independent auditor's report.

**NOTE L – DISCLOSURES REQUIRED UNDER MASSACHUSETTS GENERAL LAW C.40 § 4E -
continued**

Annual determination and disclosure of cumulative surplus

Cumulative Surplus Calculation – FY20		Page(s) in financial statements
(A)	Voted Cumulative Surplus as of 6/30/19	\$ 4,603,254 (A) p. 11
(B)	1 Amount of (A) used to support the FY20 Budget (B)1	\$ -
	2 Amount of (A) returned to member districts (B)2	(\$1,400,000)
	(B)1 + (B)2 = (B)	(\$ 1,400,000) (B) p. 11
(C)	Unexpended FY20 General Funds	\$ 1,802,665 (C) p. 11
(D)	Cumulative Surplus as of 6/30/20 (A) - (B) + (C) = (D)	\$ 5,005,919 (D)
(E)	FY20 Total General Fund Expenditures*	\$18,039,402 (E) p. 11
(F)	Cumulative Surplus Percentage (D) ÷ (E)	28% (F)
	Estimated Amount of Excess Cumulative Surplus as of 6/30/20	\$ 496,069 ***

*Reconciliation of Total General Fund Expenditures to the Statement of Revenues, Expenditures and Changes in Fund Balances – Governmental Funds on page 11:

Total Expenditures:	\$23,765,723
Intergovernmental Expense:	(5,009,654)
	18,756,069
Approved transfer to capital reserve:	200,000
One-time payment for leasehold improvements:	(1,000,000)**
FY20 depreciation on leasehold improvements above:	83,333**
Total General Fund Expenditures per calculation above:	\$18,039,402

**During the year ended June 30, 2020, the Collaborative paid for \$1,000,000 of improvements to a leased facility. The payment was approved and budgeted by the Collaborative’s board of directors. However, because this was a special one-time payment, the Collaborative requested clarification from the Department of Elementary and Secondary Education (“DESE”) regarding treatment of the expenditure. DESE requested that the \$1,000,000 capital expenditure be treated as an expenditure over the remaining lease term of 9 years for purposes of determining the cumulative surplus funds in excess of 25% of general fund expenditures.

***Subsequent to June 30, 2020, but prior to issuance of the financial statements, the Collaborative’s board of directors voted to return \$600,000 of additional funds to member districts. The \$600,000 exceeds the required excess to be returned to districts.

Governance and Leadership

Board of Directors and Member Districts

The Valley Collaborative is governed by a Board of Directors comprising representatives from its nine member districts. The members of the Board of Directors in FY '19 were:

Chairperson Mr. Timothy Piwowar, Superintendent of the Billerica Public Schools
Dr. Michael Flanagan, Superintendent of the Tyngsborough Public Schools
Dr. Jay Lang, Superintendent of the Chelmsford Public Schools
Mr. Steven Stone, Superintendent of the Dracut Public Schools
Dr. Laura Chesson, Superintendent of the Groton-Dunstable Regional School District
Dr. Denise Pigeon, Superintendent of Nashoba Valley Technical School District
Mr. Brad Morgan, Superintendent of the North Middlesex Regional School District
Mr. Christopher Malone, Superintendent of the Tewksbury Public Schools
Mr. Everett (Bill) Olsen, Superintendent of the Westford Public Schools

Advisory Committee

Valley Collaborative's Board of Directors and District Planning Team currently act in an advisory committee role.

Staffing Information

Valley Collaborative employs Department of Elementary and Secondary Education licensed teachers. The Collaborative's other professional staff includes licensed speech and language pathologists, occupational therapists, physical therapists, social workers, guidance counselors, board certified behavior analysts, music therapists, psychologists and nurses. In addition, the Collaborative contracts the services of a physician and a psychiatrist.

Key Management and Program Staff

District Staff:

Dr. Chris A. Scott, Executive Director
Mr. James George, Business Manager/Accountant
Ms. Joia Mercurio, Deputy Director
Ms. Kari Morrin, Director of Human Resources
Ms. Heather Valcanas, Director of Adult and Transitional Services
Ms. Jessica Scalzi, Lead Nurse

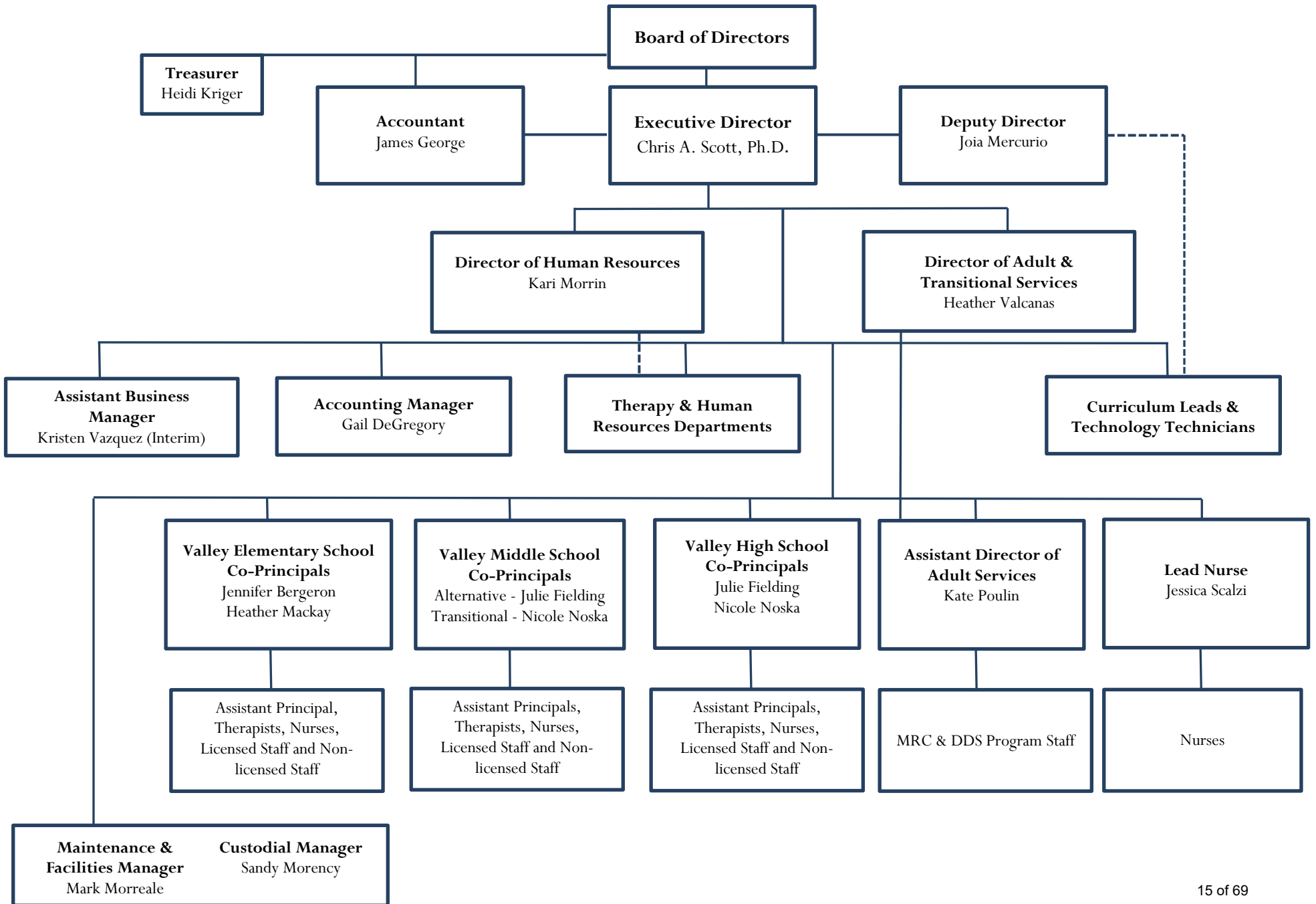
DESE Program Staff:

Ms. Jennifer Bergeron, Principal, Valley Elementary School
Ms. Heather MacKay, Principal, Valley Elementary School
Ms. Nicole Noska, Principal, Valley Transitional Middle and High School – Transitional
Ms. Julie Fielding Principal, Valley Transitional Middle and High School – Alternative

DDS/MRC Program Staff:

Ms. Katherine Poulin, Assistant Director of Adult Services

Mr. Matt Gentile, DDS Program Coordinator



Programs and Services Provided

The Collaborative offers the following types of programs and services, which complement and augment the educational programs and services of the member districts in a cost-effective manner.

- Day school placements and other programs and services, including educational, therapeutic, transitional, and occupational programs and services for students and individuals with disabilities.
- Professional Development programs for general and special educators.
- Other appropriate services and programs as may be established and approved by the Board of Directors of the Collaborative.

The programs offered to students continue to support their academic, transitional, emotional, and behavioral progress. Our K-Age 22 programs run September through June and offer additional summer programming. Valley's adult programs operate year round. In addition, the Collaborative feels it is important for our students to have state-of-the-art adaptive technology that enables them to fully engage in the curriculum. To support the mission, the Collaborative continues to upgrade its technology in all schools. The Collaborative is committed to offering high quality programs in a fiscally responsible manner. A student-focused budget with a mission to improve student outcomes is always more cost-effective than a budget disconnected from the mission.

2019 - 2020 Average Number of Students

Valley Collaborative served 380 students (K-Age 22) during the 2019-2020 school year.

Program Offerings Overview

K-12 Programs:

Valley Elementary School
Valley Middle School
Valley Transitional High School

Adult Programs:

Valley's Today-and-Tomorrow Program
Valley's Massachusetts Rehabilitation Commission Funded Programs
Job Development

Valley Elementary School

135 Coburn Road, Tyngsborough, MA

Our Goal

Valley Elementary School's goal is to provide a school experience for every child.

Valley Elementary School provides a school experience for every child, in a supportive, therapeutic environment. We cater to students with a range of cognitive, language and learning disabilities, as well as those with executive functioning needs, Autism, mental health issues and behavior challenges. Students have access to literacy, math, language and writing as well as science and social studies at their individual

level. Our school utilizes experiential education to help students develop social skills, confidence and comfort with positive risk challenges. We also encourage families to participate in the school experience. Family events, volunteer opportunities and our Parent Advisory Group all provide a much-needed connection.

Autism Pragmatic Sensory classrooms are ABA designed to meet the needs of students diagnosed with Autism, as well as students with pragmatic, sensory or behavioral needs. We use a team approach to provide each student with individualized behavior and academic supports.

Emotional Behavior classrooms provide a therapeutic environment for students who have emotional, mental health, behavioral or social adjustment difficulties that may limit their ability to make progress in a traditional school setting. The classrooms use positive behavior support and collaborative problem solving to help students focus on school, develop relationships and build self-esteem. Our tailored approach and expert team ensure that every student has an individualized behavior and academic plan.

Valley Collaborative Elementary School is staffed by therapists and educators who've received extensive training in the most current research-based intervention strategies. Our integrated therapy approach utilizes behavior analysts, speech/language pathologists, occupational therapists, physical therapists, music therapists and social workers who work with the classroom staff to ensure that all of our students' needs are met.

After-school Programming

We offer a variety of after-school activities including community outings, recreation and social skills groups.

Parent Training

We also offer a parent training series that incorporates behavioral as well as social techniques to help parents help their children

Valley Middle School

40 Linnell Circle, Billerica, MA

Our Goal

Valley Middle School's goal is to prepare students for successful adult living.

The Valley Middle School provides a supportive, therapeutic environment, tailored to meet students' individual learning needs. Our school is staffed by trained professionals who help students discover their strengths, interests and abilities. Small class sizes, individual instruction and classroom technology keep students motivated and engaged. In addition to a rich curriculum, students also have access to programs, including:

- social skills group
- life skills training
- art education

- music therapy
- electives, including band, cooking, school spirit, creative arts, health and wellness
- community based activities
- field trips
- experiential physical education

Emotional Behavioral (EB) classrooms provide a therapeutic setting for students who have emotional, behavioral or social adjustment difficulties that may have kept them from making progress in a traditional school setting. EB classrooms are appropriate for students with a range of cognitive abilities or learning disabilities, as well as those with executive functioning or behavior challenges.

Autism Spectrum Disorder (ASD) classrooms provide services designed to meet the needs of students diagnosed with autism, as well as students with pragmatic, sensory or behavioral needs. The classrooms provide consistency, positive reinforcement and individual behavior support plans, as needed.

The Interim Alternative Education Setting (IAES)/ Extended Evaluations allow our skilled professionals to assess what kinds of supports and therapeutic approaches will best help students meet their educational goals.

Valley Transitional High School

40 Linnell Circle, Billerica, MA

Our Goal

Valley Transitional High School's goal is to prepare students to become successful members of their communities.

Valley Transitional High School provides a supportive, therapeutic environment that assists students with their social, emotional, behavioral and academic needs. We seek to instill our students with the confidence and ability to successfully earn a high school diploma, transition into the workplace or a post-graduate program.

Valley Transitional High School classrooms provide a therapeutic setting for students who have social, emotional, behavioral or academic needs. Students develop transitional skills so that they are prepared to successfully enter college and the working world after graduating from high school. We offer a trusting, structured and safe environment that allows students to give and receive productive feedback from their peers, and encourages them to make positive choices. Students attend small classes taught by trained educators who use individualized instruction, state-of-the-art technology and innovative instructional strategies to engage and motivate them.

The Intensive Special Needs classroom provides comprehensive services to students with moderate to intensive physical, developmental and intellectual impairments. Our specialized instruction and expert staff is able to meet the needs of individual students. The curriculum focuses on academics, vocational, social and life skills.

Vocational Opportunities

Students have a variety of opportunities to develop vocational skills, including: culinary, woodshop, landscaping, and car detailing. We collaborate with local businesses and community groups to offer students the knowledge and work experience they will need for employment. Students can also participate in internships in the surrounding community. Community service opportunities allow students to develop a positive self-identity through volunteering.

Additional Programming

The Experiential Physical Education program gives students the opportunity to take positive risks and challenge themselves in order to develop leadership and problem solving abilities, along with communication skills. Community service opportunities allow students to develop a positive self-identity through volunteering. Eligible students who are on track to graduate and in solid academic standing may also participate in dual enrollment and work study programs.

Contract Services

Valley Collaborative provides a contract service to those districts in need. A contract service is a service that a district needs in their own district and is not provided to a student enrolled in a Valley Collaborative program and can include but is not limited to:

- Therapy (Speech, Occupational & Physical)
- Reading Specialist
- Transition Specialist
- Augmentative and Alternative Communication Specialist
- Social Work
- ABA Therapist
- Board Certified Behavior Analyst
- Tutoring
- One-on-one Transitional Aide
- One-on-one Behavioral Aide
- One-on-one Nurse
- Restraint Training

A Valley Collaborative Member or Non-Member District may also contract with Valley Collaborative for an assessment for a non-valley student. The contract services assessments available to districts include:

- Speech Language Evaluation
- Occupational Therapy Evaluation
- SIPT Assessment
- Sensory Integration & Praxis Test – 17 subtests
- Physical Therapy Evaluation
- Functional Behavioral Assessment
- Functional Vocational Evaluation(V5)
 - Sensory-motor · Strengths
 - Gross & Fine Motor · Preferences and Interests
 - Coping/Adaptive Behavior · Work adjustment and Job readiness

- Autonomous Living
- Learning Style
- Student Observation
- Transition Assessment (V10)
- V5 and:
 - Adaptive Living · Transition
 - Self –Determination · Social
 - Employability · Person-Centered Planning
- Observational Assessment
- Cognitive/Intelligence Testing

Adult Services

25 Linnell Circle, Billerica, MA

Our Goal

Valley Collaborative’s Adult Services goal is to support our adult community in reaching lifelong goals.

Our Adult Services focuses on building a community that promotes individuality, independence and community inclusion. Valley Collaborative believes in a person-centered approach that provides supports in order to help our community of adults realize maximum independence, rewarding experiences, diverse vocational opportunities and continual growth.

Today & Tomorrow

Valley’s Today and Tomorrow program, funded by the Department of Developmental Services (DDS), helps adults identify and attain their goals regarding involvement in personal or community activities and work status.

Valley’s Massachusetts Rehabilitation Commission Funded Programs

Valley’s Evaluation and Training program, funded through the Massachusetts Rehabilitation Commission (MRC), assists individuals in preparing for and obtaining competitive employment. Valley’s Supported Work program, funded through MRC, provides long-term supports to adults who have obtained employment through MRC.

Job Development

Valley Collaborative’s job development team has over 100 years combined experience in building community business partnerships and working to assist people with disabilities find and secure competitive and supported employment. Some of the services we provide include:

- Assessment
- Individual supported employment
- Skills training

- Group supported employment
- Job placement
- Community-based day supports
- Initial, interim, and ongoing job supports
- Volunteer opportunities
- Job development
- Job coaching

Therapeutic Services

Most of Valley’s students receive one or more therapeutic services.

Occupational Therapy, Speech Language Therapy, Physical Therapy, and Behavioral Analysis

The therapist(s) role in the Collaborative is to provide services to students through an integrated therapy model, which research supports as the most effective manner to provide services. Team collaboration is at the heart of the integrated therapy model. The team works together for the functional independence and success of the students. The team arrives at a shared set of goals for the students and implementation occurs across the routines of the day.

Using this model, therapists work with students within the classroom environment and during naturally occurring routines and activities. This helps reduce the student’s need to generalize skills from a clinical or “pull out” model to realistic situations that occur with the classroom and school environments. It also increases opportunities for peer modeling and frequent practice of targeted objectives. Various therapists may also be in the classroom for the same block of time to “co- treat” or implement strategies that draw on their combined expertise.

This model also includes consultation, program monitoring, and staff training. Therapists train teaching staff to extend therapeutic interventions into classroom activities and other ongoing activities that occur throughout the student’s day. The therapists determine recommendations for service delivery, develop IEP goals and benchmarks specific to discipline, actively engage members of the multidisciplinary team to best meet student’s needs, consult with staff and other professionals to ensure generalization of newly learned skills, and implement staff training and parent education.

Areas of Assessment and Treatment

Occupational Therapy:

- Handwriting skills and keyboarding
- Fine motor skills
- Activities of daily living(ADL’s)
- Visual motor skills
- Visual perceptual skills
- Motor planning skills
- Sensory processing skills
- Upper extremity function
- Environmental modification
 - Upper extremity coordination

- Sensory integration assessments
- Life skills

Speech Language Pathology:

- Pragmatics
- Speech sound production
- Resonance
- Phonology
- AAC
- Swallowing/feeding
- Voice
- Fluency
- Expressive and receptive language
- Cognition and executive functions
- Syntax and grammar
- Pro-social skills

Physical Therapy:

- Functional mobility
- Positioning to promote optimal participation
- Gross motor skills and motor planning
- Equipment assessment (wheelchairs, walkers, seating)
- Tonal inhibition and facilitation
- Posture
- Range of motion and strengthening
- Vendor consultation
- Orthotics management
- Core stability and strengthening

Board Certified Behavioral Analysis:

- Behavior support plans
- Functions of behavior
- Staff training
- Reinforce and motivation assessment
- Representation of graphs for data
- Data collection systems
- Discrete trial planning
- Parent training
- Skills assessments

Counseling and Social Work

A supportive therapeutic environment is an essential component of the student's overall experience at Valley. Valley's clinical component addresses student's social, emotional, developmental, and behavioral needs. The clinical team, in conjunction with the teaching staff, BCBA's, speech and language therapists, occupational therapists, and physical therapists, identifies student's individual needs and addresses them through various approaches. Such approaches facilitate the development of self-awareness with the main

objective to promote overall wellness and assist each student in reaching his/her full potential. The clinical team provides individual, group, and milieu counseling as well as crisis intervention and consultation to staff. They also provide a variety of assessments and participate in IEP meetings. Regular communication with family and outside providers and specialists is essential to maximizing a student's complete educational and therapeutic experience. Valley's clinical team is comprised of Massachusetts DESE certified school social workers, and guidance counselors. Social workers also hold a Massachusetts state board license as either an LICSW or LMHC.

Medical Services

The nursing staff at Valley functions as part of the multidisciplinary team. It is our goal to promote the health, safety, and well-being of our students, as well as intervene with actual and potential health and behavioral health issues. In addition, when necessary, we manage complex medical issues and provide case management services. Our nurses network with others to build student and family capacity for adaptation, optimal independence, self-advocacy, and to build community alliances. We are a multifaceted group that provides professional nursing services to students to enhance their well-being, academic success, and lifelong achievement. Along with the educational advancement of our students, the nurses at Valley are active in their own professional growth and are actively engaged with other professional organizations.

All Collaborative students benefit from medical assistance as required and/or stipulated by his/her IEP. The Collaborative is in compliance with Massachusetts DESE and Massachusetts Department of Public Health regulations and employed a full-time Registered Lead Nurse. In addition, the Collaborative employs a nurse at each site and has a float nurse.

Assessment Services

Interim-Alternative Education Setting/ Extended Evaluations

Valley's Interim-Alternative Education Setting/ Extended Evaluations assist in determining interventions that will aid students with increasing his/her ability to perform successfully within an educational setting. The program also addresses the therapeutic needs of each student. Psychosocial needs are accessed via formal and informal assessments, while utilizing a holistic approach.

At, or before, the end of 45 days, a written report is presented at a team meeting where intervention strategies are discussed, as well as descriptions of the type of educational setting that will best meet the student's needs.

Augmented and Alternative Communication Services and Evaluations

Our Goal-to provide expert AAC evaluation and support for students, parents and staff in order to facilitate student communication. Augmentative and alternative communication (AAC) includes all forms of communication (other than oral speech) that are used to express thoughts, needs, wants, and ideas. Valley Collaborative offers speech- language pathology services specializing in augmentative and alternative communication (AAC) and language development for AAC users.

Valley Collaborative provides comprehensive AAC evaluations at competitive rates. Our expert team can determine student needs and determine a plan of action, while providing ongoing support for students and

staff beyond the evaluation period. AAC evaluations, direct therapy and consultative services are provided by certified speech-language pathologists. Valley offers:

- 30 day evaluation period
- Skilled observation, assessment and recommendations
- Implementation
- AAC device trials
- Technology assistance
- Ongoing support and consultation

Sensory Integration Praxis Test

A Sensory Integration Praxis Test (SIPT) is a comprehensive evaluation of a child's sensory systems that explores and explains the underlying neurological processes that are at the root of the presenting problems. The SIPT evaluation is designed to use with children who are at least 4 years old through 8 years 11 months, although can be used with older children. The student must have the ability to attend to and respond to testing. Our occupational therapist who specializes in sensory integration has completed specialized training in sensory integration and is certified to administer the SIPT battery.

The following is a list of presenting problems that often lead to a referral for a SIPT:

- Difficulties with developmentally-appropriate organizational skills
- Difficulty with initiation
- Difficulties performing developmentally-appropriate and school related self-care skills
- Less than developmentally-appropriate time on task

The SIPT battery includes the following 17 tests and can be given in 2 – 4 hours, over two sessions. Additionally, any one of the individual tests can be administered separately in approximately 10 minutes:

- Space Visualization
- Figure-Ground Perception
- Standing/Walking Balance
- Design Copying
- Postural Praxis
- Bilateral Motor Coordination
- Praxis on Verbal Command
- Constructional Praxis
- Localization of Tactile Stimuli
- Postrotary Nystagmus
- Motor Accuracy
- Sequencing Praxis
- Oral Praxis
- Manual Form Perception
- Kinesthesia
- Finger Identification
- Graphesthesia

Transition Services and Assessments

Valley's goal with transition services is to help students make successful transitions to life beyond school. Students who are transitioning from school to employment and community benefit from a variety of resources and support. Valley Collaborative provides a comprehensive approach to helping students, families, and school districts navigate the transition process. Valley's transition services are age appropriate and highly individualized. Our transition specialist is a DESE licensed special educator who specializes in transition services and has an extensive background in vocational services, serving both students and adults. Valley has developed transition tools, assessments, and individualized programming for students with a wide range of strengths and needs.

Transitioning to Employment and Life after School

Valley's expert transition specialist helps students transition to the fullest life possible after school, including appropriate employment and/or independent living. Our transition assessment process begins by assessing student readiness for the workplace and/or pre-vocational training including interests, skills, intellectual functioning, sensory and motor abilities, coping/adaptive behavior, employability and "soft skills." Valley also offers planning assistance for students transitioning to post-secondary education. Valley's transition specialist assesses the attributes and "soft skills" associated with self-determination including personal strengths, work preferences, self-advocacy, self-regulation, autonomy and psychological empowerment. For students moving towards independent living, Valley provides assessments of transition skills, adaptive living skills, social skills and leisure skills.

Assisting Districts

Valley's expert staff and extensive resources enable us to provide districts with an ongoing, tiered set of transition services. Valley's transition services streamline the transition process and assist districts in meeting the guidelines set forth in IDEA indicator 13 of the U.S. Department of Education, Office of Special Education programs State Performance Plan Indicators. In addition to assessments, Valley offers consultation, professional development, job coaching, and job development to districts.

Vocational Services

Our goal is to provide an environment that gives students and adults the opportunity and support to explore and reach their academic and vocational potential. Business services we provide are catering, auto-detailing, mail delivery services, assembly tasks, janitorial services, recycling, shipping and receiving, and landscaping. Valley's vocational services offer staffing solutions by providing interns, volunteer services, supervised job crews, qualified personnel, job coaching supports, and customized services to fit the needs of businesses and employers alike.

Professional Development

The Valley Collaborative offers a limited array of professional development. The professional development is primarily directed to our staff and in some instances includes staff from its member districts. The exception is professional development in the areas of restraint training and workshops provided through the Northeast Professional Educator Network (NPEN).

Valley Collaborative is a proud member district of the Northeast Professional Educator Network (NPEN). This network is comprised of approximately twenty-five school districts in the Merrimack Valley whose joint vision is to “maximize regional resources to provide high-quality, inter-district professional development, fostering a culture of collaborative inquiring in order to improve student learning.”

Cooperative Purchasing

The Collaborative does not offer cooperative purchasing but participates in it.

Joint Transportation

The Collaborative does not offer joint transportation but participates in it.

Medicaid Billing

The Collaborative does not offer Medicaid billing services but participates in it.

Outreach and Partnerships

Member School Districts

Communication and outreach are key to our success. An annual member district meeting is held in January to review the Annual Report and the Collaborative financials. Member district Superintendents, School Committee Members, Business Directors, Special Education Directors, and members of the public are invited to attend. In addition, the Collaborative hosts periodically a meeting for all its member districts’ Special Education Directors. Each meeting has a working agenda of issues we need to collaborate on to better serve our students. Furthermore, the Executive Director meets with member districts and School Committee members to inform them of the progress we are making at the Collaborative, to present financial updates and to obtain various approvals when necessary.

Community-at-large Outreach

The Collaborative also publishes a quarterly Newsletter which is sent to more than 500 families and state officials, agencies, and businesses. In addition, each school publishes its own Newsletter. If you would like to be on the distribution list, please contact us.

The Collaborative has a newly developed website: www.valleycollaborative.org

The Valley Collaborative participates in the Massachusetts Dual Enrollment Program and enrolls students with disabilities at the Middlesex Community College. The Dual Enrollment Program at the Collaborative serves students with moderate and severe disabilities, and supports college and career success through the provision of a free and appropriate public education in the least restrictive environment. The program:

- Promotes and enhances academic, social, functional, integrated competitive employment skills, and other transition-related goals;

- Provides opportunities for the inclusion of students with moderate and severe disabilities in credit and non-credit courses alongside their non-disabled peers;
- Promotes participation in the student life of the college community.

Cost-Effectiveness of Programs and Services

Please note, Valley Collaborative prides itself in providing its member districts with superb special education programming for its out-of-district students as well as limited contracted services support.

Tuition rates have been compared based on program descriptions. Given the differences among programs and services, a proper cost effective analysis is almost impossible without requiring full disclosure of student to staff ratio per program and transparency on the therapies included in the cost of a tuition rate. I would be happy to discuss how a cost effective analysis could be more meaningful and accurate if the proper data points were made public.

2020 VALLEY MEMBER & NON-MEMBER TUTION RATES VS. PRIVATE SCHOOLS*

Valley Collaborative Program	Private Schools Average	Member District Per Diem Tuition	Member District Per Diem Savings	Member District Percent Cost Savings	Non-Member District Per Diem Tuition	Non-Member District Per Diem Savings	Non-Member District Percent Cost Savings
Intensive Special Needs (ISN)	\$496.69	\$294.00	\$202.69	41%	\$366.50	\$130.19	26%
Elementary School - Emotional Behavioral	\$427.75	\$240.00	\$187.75	44%	\$300.00	\$127.75	30%
Elementary School - Pragmatic, Sensory, and Behavior	\$427.75	\$240.00	\$187.75	44%	\$301.50	\$126.25	30%
Middle School - Emotional Behavioral	\$406.21	\$240.00	\$166.21	41%	\$300.00	\$106.21	26%
Middle School – Pragmatic, Sensory, and Behavior	\$406.21	\$240.00	\$166.21	41%	\$301.50	\$104.71	26%
High School - School & Vocational Training	\$419.95	\$179.00	\$240.95	57%	\$223.77	\$196.18	47%
High School - School & Life Skills Training	\$430.93	\$179.00	\$251.93	58%	\$232.50	\$198.43	46%
High School & Middle School - School & Life Skills Training ISN	\$420.11	\$294.00	\$126.11	30%	\$366.50	\$53.61	13%
High School - School to Work Program		\$179.00	N/A	N/A	\$226.50	N/A	N/A
High School - Alternative Program	\$424.92	\$210.00	\$214.92	51%	\$262.50	\$162.42	38%
High School - Alternative Vocational Program		\$210.00	N/A	N/A	\$262.50	N/A	N/A

*See table on following page which list tuition rates for the ten private schools used for the “Average” calculations.

2020 VALLEY COLLABORTATIVE VS. PRIVATE SCHOOLS TUITION RATES

Valley Collaborative Program	Boston Higashi School	Cotting School, Inc.	Franciscan Children's Hospital	Landmark Foundation	Lighthouse School	May Institute	Nashoba Learning Group, Inc.	New England Center for Children	Seven Hills Foundation, Inc.	League School of Boston	Private Schools Average
Intensive Special Needs (ISN)			\$453.12					\$540.26			\$496.69
Elementary School - Emotional Behavioral	\$362.84	\$446.90			\$485.10	\$506.66	\$515.00		\$199.63	\$478.15	\$427.75
Elementary School - Pragmatic, Sensory, and Behavior	\$362.84	\$446.90			\$485.10	\$506.66	\$515.00		\$199.63	\$478.15	\$427.75
Middle School - Emotional Behavioral	\$362.84	\$446.90				\$506.66	\$515.00		\$199.63		\$406.21
Middle School – Pragmatic, Sensory, and Behavior	\$362.84	\$446.90				\$506.66	\$515.00		\$199.63		\$406.21
High School - School & Vocational Training		\$446.90	\$453.12		\$485.10		\$515.00		\$199.63		\$419.95
High School - School & Life Skills Training	\$362.84	\$446.90	\$453.12		\$485.10	\$506.66	\$515.00		\$199.63	\$478.15	\$430.93
High School & Middle School - School & Life Skills Training ISN	\$362.84	\$446.90	\$453.12		\$485.10		\$515.00		\$199.63	\$478.15	\$420.11
High School - School to Work Program											
High School - Alternative Program				\$311.51	\$485.10					\$478.15	\$424.92
High School - Alternative Vocational Program											

Valley Collaborative
Statement of Net Position
June 30, 2020

Assets

Current Assets	
Cash and cash equivalents	\$ 7,327,503
Accounts receivable, net	1,441,379
Prepaid expenses and other assets	37,583
Total Current Assets	8,806,465
Non-current Assets	
Furniture, equipment, vehicles and leasehold improvements, net	8,335,554
Total Non-current Assets	8,335,554
Total Assets	17,142,019

Deferred Outflows of Resources

Deferred Outflows of Resources Related to OPEB	1,914,061
Total Assets and Deferred Outflows of Resources	\$ 19,056,080

Liabilities, Deferred Inflows and Net Position

Current Liabilities	
Accounts payable and accrued liabilities	\$ 879,854
Credits due to member districts	1,400,265
Total Current Liabilities	2,280,119
Non-current Liabilities	
Net OPEB liability	3,054,714
Total Non-current Liabilities	3,054,714
Total Liabilities	5,334,833

Deferred Inflows of Resources

Deferred Inflows of Resources Related to OPEB	1,235,164
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Net Position

Net Position	
Unrestricted	2,630,102
Restricted - contributions and other	20,427
Restricted - capital reserve fund	1,500,000
Invested in capital assets, net of related debt	8,335,554
Total Net Position	12,486,083
Total Liabilities, Deferred Inflows and Net Position	\$ 19,056,080

See accompanying notes to financial statements and independent auditor's report.

Valley Collaborative
Statement of Activities
For the year ended June 30, 2020

Functions/ Programs	Program Revenues			Net (Expense) Revenue and Changes in Net Position
	Expenses	Charges for Services	Operating Grants and Contributions	
Governmental Activities:				
Administration	\$ 1,842,248	\$ -	\$ -	\$ (1,842,248)
Education	15,246,335	17,728,460	2,943,191	5,425,316
Intergovernmental revenue and expense	5,009,654	-	5,009,654	-
Other postemployment benefits	918,812	-	-	(918,812)
Depreciation and amortization	764,095	-	-	(764,095)
Total Governmental Activities	\$ 23,781,144	\$ 17,728,460	\$ 7,952,845	\$ 1,900,161
General Revenue and Other:				
Interest				28,958
Other				2,802
Gain on disposal of assets				73,500
Credits to member districts				(1,400,000)
Total General Revenue and Other				(1,294,740)
Change in Net Position				605,421
Net Position, Beginning of Year				11,880,662
Net Position, End of Year				\$ 12,486,083

See accompanying notes to financial statements and independent auditor's report.

**NOTE L – DISCLOSURES REQUIRED UNDER MASSACHUSETTS GENERAL LAW C.40 § 4E -
continued**

Annual determination and disclosure of cumulative surplus

Cumulative Surplus Calculation – FY20		Page(s) in financial statements
(A)	Voted Cumulative Surplus as of 6/30/19	\$ 4,603,254 (A) p. 11
(B)	1 Amount of (A) used to support the FY20 Budget (B)1	\$ -
	2 Amount of (A) returned to member districts (B)2	(\$1,400,000)
	(B)1 + (B)2 = (B)	(\$ 1,400,000) (B) p. 11
(C)	Unexpended FY20 General Funds	\$ 1,802,665 (C) p. 11
(D)	Cumulative Surplus as of 6/30/20 (A) - (B) + (C) = (D)	\$ 5,005,919 (D)
(E)	FY20 Total General Fund Expenditures*	\$18,039,402 (E) p. 11
(F)	Cumulative Surplus Percentage (D) ÷ (E)	28% (F)
	Estimated Amount of Excess Cumulative Surplus as of 6/30/20	<u>\$ 496,069</u> ***

*Reconciliation of Total General Fund Expenditures to the Statement of Revenues, Expenditures and Changes in Fund Balances – Governmental Funds on page 11:

Total Expenditures:	\$23,765,723
Intergovernmental Expense:	<u>(5,009,654)</u>
	18,756,069
Approved transfer to capital reserve:	200,000
One-time payment for leasehold improvements:	(1,000,000)**
FY20 depreciation on leasehold improvements above:	<u>83,333**</u>
Total General Fund Expenditures per calculation above:	<u>\$18,039,402</u>

**During the year ended June 30, 2020, the Collaborative paid for \$1,000,000 of improvements to a leased facility. The payment was approved and budgeted by the Collaborative’s board of directors. However, because this was a special one-time payment, the Collaborative requested clarification from the Department of Elementary and Secondary Education (“DESE”) regarding treatment of the expenditure. DESE requested that the \$1,000,000 capital expenditure be treated as an expenditure over the remaining lease term of 9 years for purposes of determining the cumulative surplus funds in excess of 25% of general fund expenditures.

***Subsequent to June 30, 2020, but prior to issuance of the financial statements, the Collaborative’s board of directors voted to return \$600,000 of additional funds to member districts. The \$600,000 exceeds the required excess to be returned to districts.

Valley Collaborative’s District Improvement Plan

Designed to achieve the Purpose and Objectives set forth in the Collaborative Agreement

2015-2020

Plan Overview

<p>Valley Collaborative’s Articles of Agreement ARTICLE II</p> <p>Mission, Objectives, Focus, and Purpose</p>
<p>The mission of the Collaborative is to conduct educational programs and/or services for member districts in a cost-effective manner and to increase educational opportunities and to improve educational outcomes for its students. The purpose of the Collaborative is to provide high quality intensive educational, therapeutic and transitional programs and related services to individuals with disabilities referred by member districts, non-member districts and social service agencies, including both children and adults, and to provide professional development to educators. The focus of the Collaborative is the provision of special education, transitional, occupational, and therapeutic programs and services in the least restrictive environment and comprehensive professional development within the local communities of the member districts. The overall objectives of the Collaborative include improving the academic achievement and/or occupational skills of students and individuals with disabilities in the least restrictive environment through high quality programs and services; offering a variety of high quality professional development opportunities to general and special education teachers and related service providers; and offering its programs and services in a cost-effective manner.</p>
<p><i>Mission</i></p>
<p>To work collaboratively to create a structured learning environment that empowers individuals to lifelong learning and to navigate confidently and with optimal independence in their community.</p>
<p><i>Vision</i></p>
<p>Valley Collaborative partners with families, districts, and the community to provide innovative programming that empowers students and adults to discover their individual strengths, interests, and abilities. In doing so, students become responsible contributing members of society.</p>
<p><i>Theory of Action</i></p>
<p><i>If we...</i></p> <ul style="list-style-type: none"> ● Identify students’ immediate and long-term individualized goals, strengths, and needs and provide support to meet them, and... ● Build the capacity of, and invest in, our staff, and... ● Invest in community building across the Collaborative, with all stakeholder groups, <p><i>Then we will...</i></p> <ul style="list-style-type: none"> ● Increase student independence and prepare students for successful post-secondary placement and adult living ● Increase staff professional capacity and the retention of certified staff ● Improve the engagement of all stakeholders in the Collaborative community
<p>Status Key Completed: Benchmark action taken, no further action required. Met: Demonstrated proficiency of criteria or standard. Ongoing: Benchmark action taken and will be monitored periodically as indicated. In Progress: Benchmark is in the process of being worked on.</p>

Strategic Objectives

<p>1. All students and adults will be prepared for successful adult living</p>	<p>2. Valley Collaborative will provide professional development to build capacity and retain high quality staff</p>	<p>3. Valley Collaborative will foster a sense of belonging and engagement in the Collaborative community for all stakeholders (students, adults, families, staff, districts, community partners)</p>
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Strategic Initiatives

<p>a.) Develop and Implement Common Core and Job Skills Curriculum Functional academics, job development and training</p>	<p>a.) Provide Content-specific PD in Technology</p>	<p>a.) *Provide Team Building for Students Develop appropriate activities to establish commitment and respect for learning goals <i>*Baseline data related to student self-advocacy skills and the need for team building has been gathered through the Sense of Belonging Surveys. The district improvement planning team will consider this data and whether or not there is a need for any additional work in the next plan.</i> <i>The data systems we have put in place through the implementation of this District Improvement Plan will help us identify best practices to share from school to school.</i></p>
<p>b.) Improve Transition Planning Earlier assessment and communication; explore post-secondary options; travel training; community resources</p>	<p>b.) Build Capacity Through Induction and Mentor Programs for Educators and Leaders, and Provide Leadership Opportunities</p>	<p>b.) Maintain Community Involvement Identify and develop Valley Collaborative facilitated events with the purpose of maintaining community involvement for students, adults, and community partners</p>
<p>c.) Build Independence Through Community Activities Role play and real life situations; vocational activities; practicing life skills</p>	<p>c.) Provide PD Choice: Half Days</p>	<p>c.) Increase District Participation in Advisory Board Meetings Communication; forecasting potential students and programs</p>
<p>d.) * Build Self Advocacy Skills Encourage communication w/ peers, staff, employers, worksites, and connect the communication with natural outcomes <i>*Baseline data related to student self-advocacy skills and the need for team building has been gathered through the Sense of Belonging Surveys. The district improvement planning team will consider this data and whether or not there is a need for any additional work in the next plan.</i> <i>The data systems we have put in place through the implementation of this District Improvement Plan will help us identify best practices to share from school to school.</i></p>	<p>d.) All staff: Participants evaluate professional development offerings.</p>	<p>d.) Increase and Maintain Student and Family Communication Parent orientation; invite and inform; current events; website; email</p>
<p>e.) Self Actualization: Create programming that promotes growth towards self-actualization for students and adults</p>	<p>e.) Establish Professional Learning Communities</p>	<p>e.) Develop and Share Best Practices School and Collaborative-wide; Internal transition planning; communication <i>*Baseline data related to student self-advocacy skills and the need for team building has been gathered through the Sense of Belonging Surveys. The district improvement planning team will consider this data and whether or not there is a need for any additional work in the next plan.</i> <i>The data systems we have put in place through the implementation of this District Improvement Plan will help us identify best practices to share from school to school.</i></p>
<p>f.) Track student's/adult's progress on their annual IEP/ISP goals</p>	<p>f.) Network to provide Opportunities to Work Collaboratively with School Districts and Collaboratives in the Northeast</p>	

g.) Administer Independence survey		
h.) Track Post-secondary Plan/Placement		
<i>Outcomes</i>		
1.1 By the 2019-2020 school year, each Valley student/adult who has been enrolled for a year or longer will receive a ‘met’ rating on his/her IEP/ISP goals a minimum of 70% of the time.	2.1 Professional Development opportunities will receive an overall rating of “very good” on feedback evaluation forms 80% of the time by year five.	3.1 A minimum of one engagement initiative conducted annually, demonstrated through an artifact, targeting each group – students, adults, families, staff, districts, and community partners.
1.2 During the 2016-2017 school year, the Independence Survey will show a 10% increase in greater independence on the student’s IEP/ISP goals	2.2 50% of certified staff will still be employed at Valley Collaborative by the end of year 3 of this plan.	3.2 Participation in Community Involvement events will remain steady or increase by 10%.
1.3 By the 2019-2020 school year, 90% of Valley graduates will be entering a college, state agency program, and/or other career track.		

Action Plan

Strategic Objective:

- 1.) All students and adults will be prepared for successful adult living

Initiative:

- 1a.) *Develop and implement common core and job skills curriculum – Functional academics, job development and training*

Monitoring Progress:

Process Benchmark for Initiative 1a	Person Responsible	Date	Status
Develop curricula Teams	Karen Rowe, Transition Specialist	Winter 2015	Completed
Inventory curricula products	Karen Rowe, Transition Specialist	Spring 2016	Completed
Assess curricula strengths and areas needing further development through data analysis	Karen Rowe, Transition Specialist	Fall 2016	Completed
Make recommendations as appropriate	Karen Rowe, Transition Specialist	Fall 2016	Completed
Develop a program of studies for grades 9-12 (Valley Transitional High School – Sites 1 & 2)	Math/English Dept. Heads	Winter 2016	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark for Initiative 1a	Person Responsible	Date	Status
Attendance at Curriculum meetings	Karen Rowe, Transition Specialist	Winter 2016	Completed
Upload inventory on shared/Google drive	Karen Rowe, Transition Specialist	Winter 2016	Completed
Create final recommendations/proposals	Karen Rowe, Transition Specialist	Winter 2016	Completed
Review and adjust program of studies	Karen Rowe, Transition Specialist	Winter 2016	Completed

Monitoring Progress:

Process Benchmark for Initiative 1a	Person Responsible	Date	Status
Develop Assessment Teams	Karen Rowe, Transition Specialist	November 2015	Completed
Inventory assessments products	Karen Rowe, Transition Specialist	Spring 2016	Completed
Assess assessment strengths and areas needing further development	Karen Rowe, Transition Specialist	Fall 2016	Completed
Make recommendations as appropriate	Karen Rowe, Transition Specialist	Fall 2016	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark for Initiative 1a	Person Responsible	Date	Status
Attendance at Assessment meetings	Karen Rowe, Transition Specialist	Winter 2016	Completed
Upload inventory on shared drive	Karen Rowe, Transition Specialist	Winter 2016	Completed
Create final recommendations and proposal to purchase new materials if needed	Karen Rowe, Transition Specialist	Winter 2016	Completed

Strategic Objective:

- 1.) All students and adults will be prepared for successful adult living

Initiative:

- 1b.) Improve transition planning: earlier assessment and communication; explore post-secondary options; travel training; community resources

Monitoring Progress:

Process Benchmark for Initiative 1b	Person Responsible	Date	Status
Implement Career Cruising curriculum in middle school and high school	Karen Rowe, Transition Specialist Principals	June 2017	Completed
Develop Work-Based Learning Plan for every student who has a vocational goal	Karen Rowe, Transition Specialist Principals	June 2017	Completed
Develop Person Centered Planning and Transition Tool (PCPTT)	Karen Rowe, Transition Specialist Principals	Sept 2015	Completed
Implement Person Centered Planning and Transition Tool (PCPTT)	Karen Rowe, Transition Specialist Principals	June 2017	Completed
Collaborate with member district to customize programming for their students regarding Transition Service.	Karen Rowe, Transition Specialist	Fall 2018	Ongoing
Open new Site 2 classroom specifically designed for students of the Autism Spectrum who may not be a great fit for the other classrooms where there is a large outdoor education social component	Julie Fielding, Principal	Winter 2017	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark for Initiative 1b	Person Responsible	Date	Status
100% of applicable teachers/staff will be trained in using Career Cruising	Karen Rowe, Transition Specialist Principals	June 2016	Completed
50% of high school and middle school students have an individual account	Karen Rowe, Transition Specialist Principals	June 2017	Completed
Each student has a Work-Based Learning Plan	Karen Rowe, Transition Specialist Principals	Fall 2018	Completed
Meet with teachers to ensure that 70% of the PCPTTs are complete	Karen Rowe, Transition Specialist Principals	Fall 2018	Completed

Strategic Objective:

1.) All students and adults will be prepared for successful adult living

Initiative:

1c.) Build Independence through community activities: role play and real life situations; vocational activities; practicing life skills

Monitoring Progress

Process Benchmark	Person Responsible	Date	Status
Identify current transitional skills curriculum collaborative wide	Karen Rowe, Transition Specialist Matt Gentile, Guidance Counselor	Fall 2017	Completed
Identify gaps in curriculum 2020-Career Cruising, ONEder, Conover, Attainment, SNAP, AFLS, HR Direct, and the Self-Directed Search have been added to date.	Karen Rowe, Transition Specialist Matt Gentile, Guidance Counselor	Winter/Spring 2017	Completed
Explore and research space for ILS curriculum SNAP and Attainment curriculum has been purchased Kitchen and laundry space has been added to 25LC	Chris Scott, Executive Director Principals Heather Valcanas, Assoc. Director of Adult Services	2019-2020 School Year	Completed
Create and implement a Google doc to capture current vocational opportunities.	Karen Rowe, Transition Specialist Heather Valcanas, Assoc. Director of Adult Services Transition Services Dept.	2019-2020 School Year	Ongoing
Identify community-based experiences by functional domains.	Karen Rowe, Transition Specialist Lia Metrakas, Asst. Principal Nicole Noska, Principal Heather Valcanas, Assoc. Director of Adult Services	2019-2020 School Year	Not Met (changed direction)
Create a Google doc to capture community-based experiences by functional domains.	Karen Rowe, Transition Specialist Lia Metrakas, Asst. Principal Nicole Noska, Principal Heather Valcanas, Associate Director of Adult Services	2019-2020 School Year	Not Met (changed direction)
Identify an annual transition assessment to administer to all high school students and adults.	Karen Rowe, Transition Specialist Lia Metrakas, Asst. Principal Nicole Noska, Principal Heather Valcanas, Assoc. Director of Adult Services	2018-2019 School Year	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark	Person Responsible	Date	Status
Utilizing a transition assessment tool to collect yearly data. The Transitional high school and adult services programs use the AFLS.	Karen Rowe, Transition Specialist	2019-2020 School Year	Completed

Teachers and Job Coaches will utilize the functional domain Google doc to plan community-based experiences.	Karen Rowe, Transition Specialist Principals Heather Valcanas, Assoc. Director of Adult Services	2019-2020 School Year	Not Met (changed direction)
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Action Plan

Strategic Objective:

- 1.) All students and adults will be prepared for successful adult living

Initiative:

- 1e.) Self Actualization: Create programming that promotes growth towards self-actualization for students and adults

Monitoring Progress

Process Benchmark	Person Responsible	Date	Status
Each school will identify their current programming and the required enhancements needed to ensure students receive the supports required to develop the skills to self-actualize. Update: The Transitional High School Transitional Programming purchased a subscription to ONEder Academy in Spring 2020, once a data is obtained from a trial period, we will reconvene to discuss next steps for Alternative Programming.	Karen Rowe, Transition Specialist Julie Fielding, Principal Nicole Noska, Principal	October 2019	Ongoing
Create a Google doc that captures current programming and activities relevant to skills that help students and adults lead to self-actualization. "Valley Student/Adult IEP/ISP Information"	Karen Rowe, Transition Specialist Julie Fielding, Principal Nicole Noska, Principal	October 2019	Completed
Identify gaps in programming based on specific needs	Karen Rowe, Transition Specialist Julie Fielding, Principal Nicole Noska, Principal	Spring 2020	Ongoing
Reconvene as a DIP Team to discuss next steps	Karen Rowe, Transition Specialist Brian Mihalek, Asst. Principal Leadership Team	Spring 2020	Ongoing

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark	Person Responsible	Date	Status
70% of Students' who have a Valley IEP will meet their IEP goals Update: *It is unclear if we met the goal of 70% because the data was not consistently collected at the conclusion of the IEP/ISP cycle but instead was reported throughout the cycle.	Julie Fielding, Principal Nicole Noska, Principal IEP Teams	June 2020	*See update note

<p>Incorporate thoughtful self-actualization questions into the Sense of Belonging Survey for students, parents, and staff.</p> <p>Status update: Student survey questions #18, 21, 22, 25, 26, 27, and 28 have been identified as self-actualization questions.</p>	<p>Sense of Belonging Committee</p>	<p>Spring 2017 Spring 2019</p>	<p>Completed</p>
<p>Analyze the data from the Sense of Belonging student survey to establish baseline data in the area of self-actualization.</p> <p>Status update: Total increase in student independence from 15/16 SY to 18/19SY was 4.9%.</p>	<p>Sense of Belonging Committee</p>	<p>April 2019</p>	<p>Completed</p>

Strategic Objective:

- 1.) All students and adults will be prepared for successful adult living

Initiative:

- 1f.) Track student’s/adult’s progress on their annual IEP/ISP goals using a “met” and “not met” scale as measured by the progress reports.

Monitoring Progress:

Process Benchmark for Initiative 1f	Person Responsible	Date	Status
Weekly progress notes are completed for adults and information is compiled to make quarterly progress reports. A new ISP Goal Form for the Today and Tomorrow Program has been created. Additionally, Valley is working with a Google consultant to create a Google Sheet to capture the “met” and “not met” student data systematically.	Heather Valcanas, Assoc. Director of Adult Services Melissa Alex, HCSIS Administrator/Program Nurse	2017- 2020 School Years	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark for Initiative 1f	Person Responsible	Date	Status
100% of adult services staff have been trained in using ISP Goal Form	Joe Venskus, Adult Services Mgr.	March 2017	Met
Job Developer has been tasked with reviewing ISP Goal Forms and working with vocational coaches to capture all relevant information regarding progress towards meeting ISP goals.	Joe Venskus, Adult Services Mgr.	January 2017	Completed
Using information gathered from ISP Goal Forms individuals have been given specific worksite modifications and tools (see weekly progress notes “support strategies” to support them in achieving ISP goals more quickly.	Heather Valcanas, Assoc. Director of Adult Services Joe Venskus, Adult Services Mgr.	August 2019	Completed

Strategic Objective:

- 1.) All students and adults will be prepared for successful adult living

Initiative:

- 1g.) Administer an Independence Survey

Monitoring Progress:

Process Benchmark for Initiative 1g	Person Responsible	Date	Status
Surveys have been developed, implemented, and completed by students/adults and families during the Spring of 2016 to collect baseline data on “Sense of Belonging”: independence, peer relationships, school culture, and impressions of staff. These surveys, including staff surveys, will be re-administered to work towards continuous improvement.	Brian Mihalek, Asst. Principal	Spring 2016 and ongoing yearly	Ongoing

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark for Initiative 1g	Person Responsible	Date	Status
By the end of the 2018/2019 survey cycle, the Sense of Belonging committee will analyze survey data derived from the “Sense of Belonging” student survey to identify 1 recommendation in order to receive a minimum of 80% of a combined ‘yes’ and ‘sometimes’ (approval) rating for each independence question by the end of the 2019/2020 school year. Status update: Questions related to independence were embedded into the Sense of Belonging student/adult surveys. Responses to those questions (18, 21, 22, 25, 26, 27, 28) from the 2015-2016SY and 2018-2019SY were quantified to gather a percentage of positive responses. Based on the percentage of positive responses from the 2015-2016SY (84.8%) and the 2018-2019SY (89.7%) Valley students and adults increased their overall independence by 4.9%.	Brian Mihalek, Asst. Principal & The Sense of Belonging Committee	Fall 2019	Ongoing

Strategic Objective:

- 1.) All students and adults will be prepared for successful adult living

Initiative:

- 1h.) Track Post-secondary Plan/Placement

Monitoring Progress:

Process Benchmark for Initiative 1h	Person Responsible	Date	Status
<p>A database was implemented by Valley Transitional High School’s guidance counselor to track this information by student name, district, and post-secondary plan: college, trade school, work, military, other, as well as adult service agencies involved. With such a diverse student population, our graduating seniors are transitioning out into a number of different opportunities.</p> <p>2015- 2016</p> <p>On site one, we have 11 students going straight into the workforce, three students continuing their education in a trade school, and four students who plan on attending college in the fall. More than half of the graduating class from site one will be working with some form of state agency, from DMH to MRC, after graduation. On site two, nine of our graduating students have enrolled in college for the fall with the other two students choosing to go directly into the work force. On site three, all but one of the graduating students will be receiving state services such as DDS with 11 of them attending an adult services program, three students enrolling in college, two students going straight to work, and one student enrolling in a trade school.</p>	Matt Gentile, Guidance Counselor	2016	Completed
<p>2016-2017</p> <p>Site 1 has 16 students graduating, all with their own specific plan. Four of these students plan to attend post-secondary institutions ranging from community college to four year universities to trade schools to hone a specific skill. Two of the students will be utilizing adult services through Valley or MRC. Nine of the students plan to go right into the work force, with four of them already securing employment. One graduating senior plans to travel for a year before committing to any sort of future education.</p> <p>Site 2 has 18 graduating seniors. 12 of these students will be attending post-secondary education also ranging from University, community college, and trade school. Three students will be utilizing adult services either continued through Valley or through MRC. Three students plan on going straight into the work force with two of those students already securing employment.</p>	Matt Gentile, Guidance Counselor	2017	Completed
<p>2017-2018</p> <p>Site 1 has eight students graduating. Two of these students will be attending Middlesex Community College in the Fall (graphic design and undeclared). One of the graduates plans to attend Universal Technical Institute to work</p>	Matt Gentile, Guidance Counselor	2018	Completed

<p>toward a certification in automotive technology. Another student will be attending JobCorps to earn a certificate in masonry. Two graduates will be moving out of state and plan to work full time. One senior will be joining the NAVY and is in the final portion of his testing. The remaining student will be receiving services through MASS REHAB to help with employment skills and placement.</p> <p>Site 2 has 12 students graduating. Three of these students will attend Middlesex Community College in the fall (computer science and undeclared). Two students will be attending Northern Essex Community College (biology and EMT – Basic). One student will be attending Lesley University and another student will be attending Fisher college in the fall. One student will be enrolling in JobCorps. One student is moving out of state and plans to work full time. Two students will be staying with Valley and enrolling in the School to Work Program. One student plans to take some time off from education and will be receiving services through MASS REHAB to help with employment skills and placement.</p> <p>Site 3 – One student will be attending the Transitions Program at Middlesex Community College. One student will be attending JobCorps.</p>			
<p>2018-2019</p> <p>Site 1-There are 10 students from Site 1 graduating this year. Three students plan to attend Middlesex Community College in the fall. Five students plan on attending trade school (UTI, Massachusetts School-Barbering, North Bennet Street School, and University of Northwestern Ohio). One student is attending Manchester Community College and the remaining student has accepted a full time position as a landscaper.</p> <p>Site 2 has 13 students graduating this year. Six students plan on attending Community College (5 attending Middlesex Community College and 1 attending Manchester Community College). Four students have been accepted at four-year colleges. One student plans on entering the Navy. One student plans on attending beauty school. One student will be deferring their diploma in order to attend a high school post-graduate program.</p> <p>Site 3- 21 students are leaving school services. One will be going to job corps and the others are transitioning to adult programs. They are accessing services through DDS and/or MRC. Two students are transitioning to the Valley Collaborative adult program. Other students will be accessing programs in their home communities.</p>	<p>Todd Fletcher, Guidance Counselor</p>	<p>2019</p>	<p>Completed</p>
<p>2019-2020</p> <p>Site 1 This year, Valley Collaborative Transitional High School-Alternative Programming will be graduating twelve seniors. Six students will be attending community college in the fall (Manchester Community College, Bunker Hill, Massachusetts Bay Community College). Two students will be attending College, (University of Massachusetts Amherst and Southern New Hampshire University). Two students have applied to join the Massachusetts Labor Union (HVAC). One student will be attending trade school (Shawsheen Tech.). One student is working with a recruiter to join the Military (Marines).</p> <p>Site 2- Valley Collaborative Transitional High School-Alternative Programming has eight graduating seniors. Three students will be attending college in the fall (University of Massachusetts Lowell, and Salem State). Two students will be attending community college (Mt. Wachusett). Two students will be working full time (Information Technology). One student has enlisted in the Military (Marines).</p>	<p>Todd Fletcher, Guidance Counselor</p>	<p>2020</p>	<p>Completed</p>

1.) All students and adults will be prepared for successful adult living

Initiative:

1h.) Track Post-secondary Plan/Placement

Monitoring Progress:

2019-2020 continued: Site 3 Transitional High School- Transitional Programming: There are 15 students transitioning out of school services and into adult services via DDS and/or MRC. Of the 15, 5 students will be receiving their diplomas from their sending districts and 2 students will be entering the Valley Collaborative Adult Services Program	Lia Metrakas, Asst. Principal	2020	Completed
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2.) Valley Collaborative will provide professional development to build capacity and retain high quality staff

Initiative:

2a.) Develop content specific PD in Technology

Monitoring Progress:

Process Benchmark for Initiative 2a	Person Responsible	Date	Status
Identify PD Focus Group members: <ul style="list-style-type: none"> ● Joia Mercurio ● Kari Morrin ● Judy Norton ● Nicole Noska ● Heather Valcanas 	PD Focus Group	September 2015	Completed
Define Valley's 'technology' uses and needs		Fall 2015	Completed
Adopt/Modify needs assessment (i.e. DESE's TSAT) for technology to collect baseline data (i.e. "How often do you use...")		Fall 2015	Completed
Administer the DESE's TSAT (modified)		Winter 2016	Completed
Assess needs assessment data		Winter 2016	Completed
Prioritize identified areas of need		Winter 2016	Completed
Modify current PD evaluation form to collect continued progress data		Spring 2016	Completed
Create PD plan for 2016 -2017 school year		Summer 2016	Completed
Provide Beginner Smart Board training for ELA and Humanities as well as Math and Science as a choice for October 7 th early release PD Day		Fall 2016	Completed
Provide Beginner and Advanced mandatory Smart Board training for all licensed staff during staff meeting times at the Elementary and Middle/High School level		Spring 2016	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark for Initiative 2a	Person Responsible	Date	Status
60% return rate of needs assessment among all staff	PD Focus Group	Winter 2016	Completed
Analyze results and identify top 3 high priority technology PD needs from needs assessment		Winter 2016	Completed

2.) Valley Collaborative will provide professional development to build capacity and retain high quality staff

Initiative:

2b.) Build Capacity through the Induction and Mentor Programs for Educators and Leaders and provide leadership opportunities

Monitoring Progress:

Process Benchmark for Initiative 2b	Person Responsible	Date	Status
Create formal Leadership Mentorship Program.	Kari Morrin, Dir.of Adult Services & Human Resources Joia Mercurio, Asst. Executive Director of Curriculum and Technology Chris Scott, Executive Director	Spring 2018	Completed
Develop Educator Mentorship Program.	Kari Morrin, Dir.of Adult Services & Human Resources Joia Mercurio, Asst. Executive Director of Curriculum and Technology	Fall 2016	Completed
Establish a Leadership PLC where people read the latest research on leadership, watch current videos and participate in leadership presentations facilitated by Dr. Tony Bent.	Dr. Tony Bent Valley Leadership Team	Fall 2016	Completed
Establish a Leadership Coffee Hour with distinguished leaders from across the state reflecting on their leadership experiences so that leaders can learn from them.	Chris Scott, Executive Director Karen Blackburn, Admin. Assistant	Fall 2016	Completed
Create networking opportunities for Valley Leaders, Board Members who are new Superintendents, Member District Assistant Superintendents, Special Education Directors and Northeast Collaborative Executive Directors through Leadership Coffee Hours, regional meetings, social gatherings.	Chris Scott, Executive Director and Regional Leaders	Fall 2016	Completed
Highlight the restructuring efforts of the past 4 years as a case study presentation to MASS's Assistant Superintendent group.	Chris Scott, Executive Director and Regional Leaders	Spring 2017	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark for Initiative 2b	Person Responsible	Date	Status
Schedule of Leadership Coffee Hours - to date, Valley has hosted two meetings	Chris Scott, Executive Director Karen Blackburn, Admin. Assistant	Fall 2016	Completed

Schedule of Leadership meetings with Dr. Tony Bent	Chris Scott, Executive Director Karen Blackburn, Admin. Assistant	Fall 2016	Completed
Schedule of FY17 Mentor and Induction Meetings	Kari Morrin, Dir.of Adult Services & Human Resources Joia Mercurio, Asst. Executive Director of Curriculum and Technology	Fall 2016	Completed

Initiative:

2c.) Provide PD Choice: Half Days

Monitoring Progress:

Process Benchmark for Initiative 2c	Person Responsible	Date	Status
Identify PD Focus Group Members: <ul style="list-style-type: none"> ● Joia Mercurio ● Kari Morrin ● Judy Norton ● Nicole Noska ● Heather Valcanas 	PD Focus Group	September 2015	Completed
Develop survey of half day model		Fall 2015	Completed
Analyze technology needs assessment priority outcomes		Winter 2016	Completed
Administer Survey of Half Day Model		Winter 2016	Completed
Develop a PD Schedule/ Catalogue of PD Offerings		Fall 2016	Completed
Identify and secure providers/trainers for 2016 - 2017 school year		Fall 2016	Completed
Work with NPEN (Northeast Professional Educators Network) to offer PD for Educators, and Related Service Providers in the Northeast Region on Election Day 2016		Ongoing	Ongoing

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark for Initiative 2c	Person Responsible	Date	Status
60% return rate of needs assessment and half day model survey	PD Focus Group	Winter 2016	Met
Provide PD Schedule of Offerings	Kari Morrin Dir.of Adult Services & Human Resources Joia Mercurio, Asst. Executive Director of Curriculum and Technology	Winter 2017	Completed

Provide schedule from October 7th half day offerings	<p>Kari Morrin Dir.of Adult Services & Human Resources</p> <p>Joia Mercurio, Asst. Executive Director of Curriculum and Technology</p>	Winter 2017	Completed
Provide schedule from NPEN day of Valley providers and in-district para trainings	<p>Kari Morrin Dir.of Adult Services & Human Resources</p> <p>Joia Mercurio, Asst. Executive Director of Curriculum and Technology</p>	Winter 2017	Completed

2d.) All staff: Participants evaluate professional development offerings.

Monitoring Progress:

Process Benchmark for Initiative 2d	Person Responsible	Date	Status
Valley evaluates all professional development offerings. The evaluation scale has simply been agree or disagree in ten targeted areas and multiple open response questions. On average the evaluations have been favorable. In order to improve the Evaluation tool Valley's PD department has asked Billerica Public Schools to see a copy of their Professional Development Feedback Form to use as a model in the redevelopment of this form.	Kari Morrin Dir.of Adult Services & Human Resources Joia Mercurio, Asst. Executive Director of Curriculum and Technology	2015-2016 School Year	Completed
Valley has modified its professional development evaluation form as a Google form and has changed its questions to emulate Billerica Public School's.	Kari Morrin Dir.of Adult Services & Human Resources Joia Mercurio, Asst. Executive Director of Curriculum and Technology	Spring 2017	Completed

Action Plan

Strategic Objective:

- 2.) Valley Collaborative will provide professional development to build capacity and retain high quality staff

Initiative:

- 2e.) Establish Professional Learning Communities (PLCs)

Monitoring Progress:

Process Benchmark for Initiative 2e	Person Responsible	Date	Status
Appoint Department Leads in STEM, English and Humanities, and Literacy	Joia Mercurio, Asst.Executive Director of Curriculum and Technology	Winter 2016	Completed
Each Department Lead to establish a PLC in their discipline	Heather McKay- Science Lead Glen Costello Math Lead Nick LeClair- Literacy Lead Meghan Waters- Literacy Lead Matt Manfredi- ELA Lead	Fall 2018	Completed
Each PLC to develop a schedule of meetings and goals and objectives for 2018- 2019 school year	Heather McKay- Science Lead Glen Costello Math Lead Nick LeClair- Literacy Lead Meghan Waters- Literacy Lead Matt Manfredi- ELA Lead	Fall 2018	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark for Initiative 2e	Person Responsible	Date	Status
Department Leads will communicate to Collaborative staff via emails, events, newsletters, etc.	Joia Mercurio, Asst.Executive Director of Curriculum and Technology	Fall 2016	Completed
Implementation of STMath in all appropriate programs	Glen Costello- Math Lead	Spring 2017	Completed

2.) Valley Collaborative will provide professional development to build capacity and retain high quality staff

Initiative:

2f.) Network to develop opportunities to work collaboratively with school districts and Collaboratives in the Northeast

Monitoring Progress:

Process Benchmark for Initiative 2f	Person Responsible	Date	Status
Joint planning with districts: Northeast Professional Educators Network (NPEN)	Kari Morrin Dir.of Adult Services & Human Resources Joia Mercurio, Asst. Executive Director of Curriculum and Technology	Fall 2016 Fall 2017 Fall 2018 Fall 2019	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark for Initiative 2f	Person Responsible	Date	Status
Comparison of number of Valley presenters from FY to FY	Kari Morrin Dir.of Adult Services & Human Resources Joia Mercurio, Asst. Executive Director of Curriculum and Technology	Fall 2016 Fall 2017 Fall 2018 Fall 2019	Completed
Scheduled list of NPEN Steering committee meetings	Kari Morrin Dir.of Adult Services & Human Resources Joia Mercurio, Asst. Executive Director of Curriculum and Technology	Fall 2016 Fall 2017 Fall 2018 Fall 2019	Completed

3.) Valley Collaborative will foster a sense of belonging and engagement in the Collaborative community for all stakeholders (students, adults, families, staff, districts, community partners)

Initiative:

3b.) *Maintain Community Involvement:* Identify and develop Valley Collaborative facilitated events with the purpose of maintaining community involvement for students, adults, and community partners

Monitoring Progress:

Process Benchmark for Initiative 3b	Person Responsible	Date	Status
<p>In order to effectively assess community involvement and more specifically, understand how to maintain or increases community involvement, one must first understand their sense of belonging. Therefore, Valley Collaborative will need to collect baseline data regarding students', adults', and families' current sense of belonging.</p> <p>1. Develop a task committee to assess engagement of student and families at Valley Collaborative.</p> <p>a. Develop meeting schedule</p>	Brian Mihalek, Asst. Principal	December 2015	Completed
<p>2. Committee meeting to discuss:</p> <p>a. Plan Overview, Action Plan Overview, types of information to be obtained from the survey, student and parent access to the survey, determine teams within the committee, brainstorm challenges/barriers to success</p>	Task Committee	December 2015	Completed
<p>3. Committee meeting to discuss:</p> <p>a. Survey methods, questions for survey that address (happiness, safety, respect, acceptance, and engagement), adjust timeline in Action Plan Template, type of survey, brainstorm challenges/barriers to success</p>	Task Committee	December 2015	Completed
<p>4. Committee meeting to discuss:</p> <p>a. Rough draft of student survey</p> <p>b. Rough draft of parent survey</p> <p>c. Define student engagement/sense of belonging in the following areas: independence, happiness, safety, respect, acceptance, and engagement, community, classroom, vocational, non-academic, and feelings towards school</p> <p>d. Define family engagement in the following areas: independence, communication, involvement in school based activities, feelings about student program, feelings about student's progress, feeling about school, and the feelings about student's happiness</p>	Task Committee	January 2016	Completed
<p>5. Committee meeting to discuss:</p> <p>a. "Sense of Belonging" definition</p> <p>b. Discuss committee feedback on student and parent survey</p> <p>c. Discuss modifications to different surveys for different populations</p> <p>d. Discuss Google Doc survey as main method for student survey</p>	Task Committee	February 2016	Completed

6. Committee meeting to discuss: <ul style="list-style-type: none"> a. Final definition of “Sense of Belonging” b. V. Drive for data collection c. Final student/parent surveys d. Communication plan for all staff e. Determine implementation phase 	Task Committee	March 2016	Completed
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7. Final meeting before implementation of surveys	Task Committee	March 2016	Completed
8. Update on progress: a. "Sense of Belonging" has been defined b. Data has been set up to be collected on the V drive through a Google Doc survey c. Final student survey was distributed beginning 4/6/16. Parent Survey has multiple drafts and will be finalized by May 16 th d. Team members have communicated the purpose and instructions of the student survey e. Student survey will be completed by all students on 4/29/16 at which point the team will start to determine data analysis protocol.	Task Committee	April 2016	Completed
9. Committee meeting to discuss: a. Define means of data analysis and collection b. Finalize parent survey	Task Committee	May 2016	Completed
10. Committee meeting to discuss: a. Data collected to date b. survey completion analysis	Task Committee	May 2016	Completed
11. Committee meeting to discuss: a. Next steps for identifying strengths/ areas of need, recommendations	Task Committee	October 2016	Completed
12. Analyze Sense of Belonging Survey data to make recommendation for Community Involvement Activities	Task Committee	October 2016	Completed
13. Plan, develop, and implement one new community involvement engagement activity Update on progress: Based on data derived from parent survey, Sense of Belonging committee identified areas of need within the parent base regarding trainings needed. In coordination with Sense of Belonging committee and Parent Advisory Council, a Parent Workshop Night has been scheduled to address these needs on May 11 th , 2017.	Task Committee	Spring 2017	Completed
14. Sense of Belonging Committee meeting to discuss: <ul style="list-style-type: none"> • Data entry for all surveys • Cycle 1 data analysis • Work with site specific teams to identify relative strengths and areas of need derived from data • Generate recommendations 	Task Committee	October 2016	Completed
15. Sense of Belonging Committee meeting to discuss: <ul style="list-style-type: none"> • Review all relative strengths and areas of need • Make modifications to cycle 2 student, parent and adult surveys • Create site specific and Collaborative wide recommendations • Discuss cycle 2 timeline 	Task Committee	November 2016	Completed
16. Sense of Belonging Committee meeting to discuss: <ul style="list-style-type: none"> • Finalize student, parent, adult surveys • Finalize site specific recommendation action plan with timeline • Start to generate staff survey questions 	Task Committee	December 2016	Completed

17. Sense of Belonging Committee meeting to discuss: <ul style="list-style-type: none"> Finalize Valley Collaborative recommendation action plan with timeline Create sub-committees to address collaborative wide recommendations Finalize cycle 2 timeline 	Task Committee	January 2017	Completed
18. Sense of Belonging Committee meeting to discuss: <ul style="list-style-type: none"> Review final site specific and collaborative wide recommendation action plan Finalize staff survey 	Task Committee	March 2017	Completed
19. Sense of Belonging Committee meeting to discuss: <ul style="list-style-type: none"> Identify Needs Strengths and areas of need/ action plan expectations Finalize Student survey Identify open ended questions (by site team) Principal email sent for open ended question feedback Create general directions for teachers/therapists Directions at the beginning of the survey 	Task Committee	Dec 17, 2018	Completed
20. Sense of Belonging Committee meeting to discuss: <ul style="list-style-type: none"> Timeline for student survey Create site specific results page 	Task Committee	Jan 16, 2019	Completed
21. Sense of Belonging Committee meeting to discuss: <ul style="list-style-type: none"> Plan moving forward <ul style="list-style-type: none"> Collaborative email sent Feb. 26th Directions to teachers/therapists being sent March 4th Student surveys due March 22nd Send out family surveys March 4th 	Task Committee	Feb 27, 2019	Completed
22. Sense of Belonging Committee meeting to discuss: <ul style="list-style-type: none"> Student and family surveys due March 29th Communicate results of last year's data and plans in the month of May Create data sheets for this year's survey data Work on staff survey results/action plan/email with directions Put together data package and memo for all stakeholders (to be distributed after all surveys are taken) 	Task Committee	April 3, 2019	Completed
23. Sense of Belonging Committee meeting to discuss: <ul style="list-style-type: none"> Enter raw data from student surveys into data sheet located in Identify strengths and areas of need Create action plan Communicate results of last year's data and plans (results memo page) in the month of May Work on staff survey results 	Task Committee	April 11, 2019	Completed
24. Staff email was sent out with an update on previous survey results to this point including strengths and areas of need.	Brian Mihalek, Asst. Principal	November 12, 2019	Completed

<p>25. Sense of Belonging Committee meeting to discuss:</p> <ul style="list-style-type: none"> • Rote Cause Analysis on data collection practices • Staff survey results • Identified areas of strength and areas of need within the Staff Survey Results 	Task Committee	February 13 th , 2020	Completed
<p>26. Implement Sense of Belonging Student Survey</p> <ol style="list-style-type: none"> a. April 2016 (baseline) b. April 2017 c. Fall 2018 d. Spring 2019 	Task Committee	A. April 2016 B. April 2017 C. Fall 2018 D. Spring 2019	A. Complete B. Complete C. Complete D. Complete
<p>27. Implementation of Adult Survey</p> <ol style="list-style-type: none"> a. April 2016 (baseline) b. April 2017 c. April 2018 d. Fall 2019 	Task Committee	A. April 2016 B. April 2017 C. April 2018 D. Fall 2019	A. Completed B. Completed C. Completed D. Completed
<p>28. Implementation of Parent Survey</p> <ol style="list-style-type: none"> a. April 2016 (baseline) b. April 2017 c. Fall 2018 d. Spring 2019 	Task Committee	A. April 2016 B. April 2017 C. Fall 2018 D. Spring 2019	A. Completed B. Completed C. Completed D. Completed
<p>29. Implementation of Staff Survey</p> <ol style="list-style-type: none"> a. April 2016 (baseline) b. April 2017 c. Fall 2018 d. Winter 2019 	Task Committee	A. April 2016 B. April 2017 C. Fall 2018 D. Winter 2019	A. Completed B. Completed C. Completed D. In Progress
<p>30. Analyze Data and make Recommendations</p> <ol style="list-style-type: none"> a. Analyze 2015-2016 Data and make Recommendations b. Analyze 2016-2017 Data and make Recommendations c. Analyze 2017-2018 Data and make Recommendations d. Analyze 2018-2019 Data and make Recommendations e. Analyze 2019-2020 Data and make Recommendations 	Chris Scott, Executive Director Brian Mihalek, Asst. Principal	A. June 2016 B. June 2017 C. June 2018 D. June 2019 E. June 2020	A. Completed B. Completed C. Completed D. Completed E. Completed

31. Report Data to stake holders and Executive Board a. Report 2015-2016 Data to stake holders and Executive Board b. Report 2016-2017 Data to stake holders and Executive Board c. Report 2017-2018 Data to stake holders and Executive Board d. Report 2018-2019 Data to stake holders and Executive Board e. Report 2019-2020 Data to stake holders and Executive Board	Chris Scott, Executive Director Brian Mihalek, Asst. Principal	A. June 2016 B. June 2017 C. June 2018 D. June 2019 E. June 2020	A. Completed B. Completed C. Completed D. Completed E. Completed
Report baseline data to stake holders and Executive Board	Chris Scott, Executive Director Brian Mihalek, Asst. Principal	June 2016	Completed

Process Benchmark for Initiative 3b	Person Responsible	Date	Status
The Elementary, Middle and High School Valley Collaborative Parent Advisory Council (PAC), will plan one engagement initiative regarding “Rights and Responsibilities in Special Education” to all families of students K-12. Middle School/High School presented on 11.17.15 Elementary and Middle School/High School scheduled to presented on 5.11.17 Elementary School met this on 10/26/17. Middle School/High School presented on 4.25.18 Middle School/High School presented on 05.01.19	Brian Mihalek, Asst. Principal Lia Metrakas, Asst. Principal Pam Walker, Asst. Principal Brian Mihalek, Asst. Principal Lia Metrakas, Asst. Principal Jennifer Bergeron, Asst. Principal Brian Mihalek, Asst. Principal Lia Metrakas, Asst. Principal Jennifer Bergeron, Asst. Principal	Fall 2016 Spring 2017 Spring 2018 Spring 2019	Completed '16 Completed '17 Completed '18 Completed '19
The Valley Collaborative Human Rights Group will plan one engagement initiative regarding “Accessing Resources in the Community” (these are stored in the curriculum binder in adult services) and completed according to DDS timeline/guidelines.	Pat Evans, Adult Program	Spring 2017	Ongoing
Develop Employee of the Month recognition initiative	Julie Fielding, Principal Nicole Noska, Principal Jennifer Bergeron, Principal Heather McKay, Principal	Ongoing	Completed
Continue to include all member districts sped directors as well as other stakeholder representatives to the District Improvement Planning process	Chris Scott, Executive Director	Fall 2016	Ongoing

Process Benchmark for Initiative 3b	Person Responsible	Date	Status
<p>In response to the Sense of Belonging survey data, the Sense of Belonging Committee has collaborated with the PAC in order to identify and develop Valley Collaborative facilitated events with the purpose of maintaining community involvement for students, adults, and community partners</p> <ol style="list-style-type: none"> 1. Facilitators at Valley Elementary School and Valley Middle School/Transitional High School have held staff luncheons in addition to meetings on the following topics: transition planning, internet safety, and parents' rights. Artifacts including agendas and sign-in sheets for these meetings have been collected. 2. PAC Facilitators at Valley Transitional Middle/High School held staff luncheons in addition to meetings and a Family Workshop Event on the following topics: transition planning, financial planning, special ed. law and parents' rights. Artifacts including agendas and sign-in sheets for these meetings have been collected. (May 1st, 2019) Status update: May 1, 2019 Middle School/High School Parent Advisory Council held their annual Family Workshop. The series of presentations covered topics in the areas of guardianship, navigating the cyber world, and transition. 	<p>Brian Mihalek, Asst. Principal</p>	<p>2015-2020 School Years</p>	<p>Ongoing</p>

Group	Engagement Initiative	Artifact	Status
Students	1. School Play Performance 2. Student Trips 3. Class Trips (Overnight) 4. After School Activities (Recreation)	1. Program 2. Permission Slips/Itineraries 3. Permission Slips 4. Schedules	Completed
Adults	1. Valley Collaborative Dance 2. Human Rights Meetings (Quarterly)	1. Flyer 2. Itineraries, Minutes, Sign-In Sheet	Completed
Families	1. Open House 2. Parent Advisory Group 3. Spirit Fridays (Elementary)	1. Sign-In Sheet 2. Meeting Minutes 3. Flyers/Invitations	Completed
Staff	1. Staff Appreciation Day 2. School Spirit Contests	1. Flyers 2. Prizes	Completed
Districts	1. District Outreach Meetings 2. SPED Advisory Meetings	1. Outreach Folders 2. Sign-In Sheet/Itineraries	Completed
Community Partners	1. District Improvement Planning 2. The INDEPENDENCE Project 3. School Play Performance	1. District Improvement Plan 2. Committee Meetings 3. Program	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark	Person Responsible	Date	Status
1. Sense of Belonging survey will have an 80% completion rate for students. Status update: 2018-2019 school year survey results had a completion rate of 81%.	Julie Fielding, Principal Nicole Noska, Principal Jennifer Bergeron, Principal Heather McKay, Principal	April '16 April '17 Fall '18 Fall '19	Met
2. Sense of Belonging survey will increase the completion rate for Families. Status update: 17% of families completed the 2018-2019 survey (94 total surveys returned).	Julie Fielding, Principal Nicole Noska, Principal Jennifer Bergeron, Principal Heather McKay, Principal	April '16 April '17 Fall '18 Spring '20	In Progress
3. Sense of Belonging survey will have a 50% completion rate \ for Adults. Status update: 2018-2019 school year survey results had a completion rate of 84%.	Julie Fielding, Principal Nicole Noska, Principal Jennifer Bergeron, Principal Heather McKay, Principal	April '16 April '17 Fall '18 Fall '19	Met
4. Report Sense of Belonging baseline data to the Board of Directors	Chris Scott, Executive Director	June '16 June '19	Completed
5. A 10% increase in participation at PAC facilitated events Status update: The PAC council had 18 participants in this years 2018/2019 school year family workshop event. This was an increase of 5 participants from last year's attendance.	PAC facilitators	Fall '17 May '19	Met

Resources Supporting Implementation

The staff and financial resources allocated to support this initiative

Resources
Google Survey
IT Consultation

Action Plan

Strategic Objective:

3.) Valley Collaborative will foster a sense of belonging and engagement in the Collaborative community for all stakeholders (students, adults, families, staff, districts, and community partners)

Initiative:

3c.) *Increase District Participation in Advisory Board Meetings:* Communication; forecasting potential students and programs

Monitoring Progress:

Process Benchmark for Initiative 3c	Person Responsible	Date	Status
1a. Establish an Outreach committee (compromised of two Valley Board of Directors, one member District Special Education Director, Valley Collaborative Executive Director and Assistant Director) 1b. Establish Co-Chair for SPED Advisory Board, and one member District SPED	Chris Scott, Executive Director	November 2015	Completed
2 The Outreach committee schedules a 60 minute meeting with the District teams. Each District team will be comprised of the Superintendent, the Special Education Director, and the district liaison(s).	Joa Mercurio, Asst. Executive Director of Curriculum and Technology	January 2016	Completed
3 Outreach committee and District teams will meet and discuss 5 year District Improvement Plan.	Outreach Committee and District Teams	April 2016	Completed
4 At the same meeting, Valley program offerings will be reviewed.	Outreach Committee and District Teams	April 2016	Completed
5 At the same meeting, Valley tuitions and services will be compared to other local Collaborative(s).	Outreach Committee and District Teams	April 2016	Completed
6 At the same meeting, there will be a review of the Out of District referrals to non-Valley placements questionnaire.	Outreach Committee and District Teams	April 2016	Completed
7 At the same meeting, review of Valley student termination questionnaire.	Outreach Committee and District Teams	April 2016	Completed
8 Member District Special Education Department to fill out questionnaires and submit to Valley Team.	Member Districts Special Education Dept.	April 2016	Completed
9 Co-chair quarterly Special Education Advisory Meeting with member district Special Education Administrators	Chris Scott, Executive Director and Valley Team	Winter 2017	Ongoing

10	Invite member district Special Education Administrators to be a part of Valley's "Leadership Coffee Hour"	Chris Scott, Executive Director and Valley Team	Winter 2017	Completed
11	Host DESE's Regional Special Education Meeting	Chris Scott, Executive Director and Valley Team	May 2017 & April 2018	Completed
12	Valley Team to analyze data from Google "Student Referral Survey" Form	Chris Scott, Executive Director and Valley Team	May 2016	Completed
13	Valley Team makes recommendation for programming changes or enhancements to Board of Directors, if required.	Chris Scott, Executive Director	June 2016 Board Meeting	Completed

Monitoring Progress:

Process Benchmark for Initiative 3c	Person Responsible	Date	Status
Create a Referral Database Committee: Joia Mercurio, Brian Mihalek, Nicole Noska, Annie Willis, Heather Valcanas, Sean Glavin, Kari Morrin, Julie Fielding, Chris Cowan, Kristine Bonsack, and Jessica Scalzi	Referral Database Committee	Winter 2017	Completed
Develop a Referral Google Form that feeds into a Google Sheet	Referral Database Committee	Spring 2017	Completed
Implement Referral Google Form	Referral Database Committee	Spring 2017	Completed
Analyze current enrollment per MS classroom (program)	MS Administration Team	Fall 2016	Completed
Establish quarterly communication protocol with Elementary School admin to identify needs (# 6th grade referrals, student movement, etc.)	MS Administration Team	Winter 2017	Completed
Input 2016/2017 SY referrals into database	MS Administration Team	Ongoing	Completed
Review data from elementary school database and current enrollment for start of 17/18 SY	MS Administration Team	Ongoing	Completed
Meet with Elementary admin to discuss projected upcoming student movement for ESY 2018	MS Administration Team	Ongoing	Completed
Analyze and review data from referral database and meet with Executive Director regarding possible programmatic needs (additional classroom space, staff, etc.)	MS Administration Team	Ongoing	Completed
Develop/adjust programming per recommendations from data gathered through referral database and elementary movement	MS Administration Team	Ongoing	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark for Initiative 3c	Person Responsible	Date	Status
Meeting completed and attendance	Chris Scott, Executive Director & Co-Chair	April 2016	Completed
Report out data, and add District Improvement Plan to website	Chris Scott, Executive Director & Co-Chair	June 2016	Completed

Action Plan

Strategic Objective:

3.) Valley Collaborative will foster a sense of belonging and engagement in the Collaborative community for all stakeholders (students, adults, families, staff, districts, community partners)

Initiative:

3d.) *Increase and Maintain Student and Family Communication:* Parent orientation; invite and inform; current events; website; email

Monitoring Progress

Process Benchmark	Person Responsible	Date	Status
Research technology based apps (i.e. Class Dojo) for parent communication from school to home Status: Researched above apps. The Elementary School is currently using Class Dojo. MS/HS has looked into Parent Link with Aspen	Annie Willis, Principal Nicole Noska, Principal Julie Fielding, Principal	Fall 2018	Met
Identify appropriateness of technology based apps per site/school for parent communication from school to home (Aspen, Class Dojo.)	Annie Willis, Principal Nicole Noska, Principal Julie Fielding, Principal	2018-2019 School Year	Met
Consult with Valley Technology Committee to research school/district website models and best practices for website maintenance Status: We are utilizing Aspen.	Annie Willis, Principal Nicole Noska, Principal Julie Fielding, Principal	August 2018	Completed
Utilize Google for student email communications	Joa Mercurio, Asst. Executive Director	2018-2019 School Year	Completed

Measuring Impact

Early Evidence of Change: Changes in practice, attitude, or behavior you should begin to see if the initiative is having its desired impact

Early Evidence of Change Benchmark	Person Responsible	Date	Status
Establish timeline for full implementation of Aspen Aspen has been fully implemented. Valley is utilizing Aspen for attendance, billing with districts, state reporting, report cards, assignment grades, and suspension notices.	Joa Mercurio, Asst. Executive Director of Curriculum and Technology Heather Valcanas, Assoc. Director of Adult Services	2019-2020 School Year	Completed



We are: Out and About

■ Page 3: After a spring shutdown, Valley students are savoring the chance to get out into nature.



We are: Making it Work

■ Page 5: Individuals in Valley's adult programs are back on site and adjusting to the 'new normal.'



We are: Glad to be Back!

■ Page 7: Valley staff and students are thrilled to be back on site and in class, even if things look a little different.

Much To Be Thankful For This Holiday Season

Dear Valley Community:

It is with great respect that I send this communication to you as the holiday season approaches. To many, the holidays are a time of reflection and mindfulness as we prepare for a new year. 2020 has been truly remarkable. We have experienced a very unprecedented time, filled with civil unrest and a wave of surprising and disturbing events around every corner. Dr. Anthony Fauci's name became well known in all of our homes. With the talk of a vaccine, there is hope that this dark chapter may soon be behind us.

While this year has been filled with more than its fair share of challenges, there is much to be thankful for. I would be remiss if I did not highlight the extraordinary amount of care each and every staff at Valley pour into their work. From developing and implementing our remote learning plans this March to engage our students/DDS and MRC supported Individuals through the physical reopening of all Valley buildings in August, Valley's Board of Directors and I am in awe of the dedication shown by staff to give the best possible outcome during the height of this pandemic. It is at this time I am reminded of the many things I am thankful for, especially at Valley.

Due to the unique relationships between students/DDS and MRC supported Individuals and staff, as well as staff and administration, Valley has been able to cultivate a culture of care as highlighted in the most recent staff survey results. Some of the highlights from this survey include:

- 95% of staff feel that Valley Collaborative is student focused. I am proud of Valley's priorities.
- 79% of staff reported feeling supported by their administrators. In spite of not having union dues, we are able to honor an open door policy with honest, transparent communication and have salary schedules that compete in the local market as well as a premier benefits package through the GIC.
- 83% of staff reported that teamwork and collaboration are things their school does well. During this pandemic, Valley has been able to allow staff to focus on one's own family by providing the ability to work remotely and grant leaves in order to accommodate personal circumstances. We at Valley believe that our staff and the support we receive from our families and school districts we serve are the key to our success.

Elementary School: Happy Harvest

Full at Valley Elementary is typically field trip time. But in a season that has been anything but typical, even a trip to a nearby Parlee Farms was now off the table. So Principal Heather Mackay got to work. If pumpkin picking was a no-go during the pandemic, what if the pumpkins came to Valley instead? “We have to be creative and think outside of the box,” says Heather. She reached out to a local greenhouse, Amherst Garden Center, which offered to donate 80 pumpkins. And since the highlight of the farm field trip experience is an apple cider donut, Heather needed to make sure there were plenty of those on hand. “I called Parlee and they donated 300 donuts and 5 gallons of apple cider,” says Heather.

Key ingredients in place, Heather and her team set about recreating the pumpkin picking experience for the students. They set up three pumpkin “patches” on the Valley Elementary field, six feet apart, in accordance with COVID guidelines. Hay bales and a scarecrow completed the farm experience. All of this work, by the



AMY MURPHY, ASSISTANT PRINCIPAL, AND HEATHER MACKAY, CO-PRINCIPAL, SHOW OFF THEIR TREASURE TROVE OF CIDER DONUTS DONATED BY PARLEE FARM.

way, was done in secret so as to surprise the students.

On the big day, three classrooms came out at a time. Each student got to pick a pumpkin, pose for a picture to be sent to their family, then head back into the classroom, where donuts and cider were waiting along with individual paint stations for pumpkin decorating. The results of the students’ handiwork were displayed on the window sill of their classrooms.

“The kids were so surprised,” says K-2 teacher Megan Erickson. “This was so great for them because they really wanted to go to the farm. They’d been asking about it. It brought a little normalcy back into the school year,” says Megan.

While the event was certainly special, it’s just the latest example of Valley Elementary’s success at “going with the flow” during this challenging time. In order to welcome students back safely, staff reenvisioned the school, centering it on individualized learning within small classes. Gone are the communal spaces—reading corners, or bean bag clusters. Instead, students have their own individual materials, color coded for easy identification, that are for them and them alone. Heather

says that Valley’s students have set an inspiring example with their resilience and adaptability. “They’ve been setting really good examples for one another. It’s calming for the staff to see that.”

Pumpkin patch day was a perfect opportunity to reward the students, says Heather. “It was pretty amazing. The kids were so excited.” Heather notes that she’s particularly grateful to the local farms that donated supplies to make the day so special. “Everyone is going through hard times but they’re all being generous.” ■



ELICIER SANCHEZ POSES WITH HIS PUMPKIN.



AIDAN MITCHELL WEARING A SPECIAL AUTUMN HAT.

Alternative Middle/High School: Renewed Connections

Relationships are at the center of everything that Valley Middle and High School Alternative Programs do—no matter where school happens to be. When the pandemic forced Valley to close back in the spring, alternative program staff quickly figured out creative ways to build engagement and a sense of connection with their students. Now, most students are back on site, and while programming may look different in this unusual season, the emphasis on relationship building remains central.

“It’s a huge part of what we do,” says history and ELA teacher Hannah Moriarty. “If you have a good relationship, that builds trust and everything follows from that.” While she concedes that building a rapport can be a bit more challenging when students and staff are wearing masks, Hannah says that remaining unfailingly optimistic is key. “There’s been a constant effort this year to stay positive. Where the teacher goes, the students follow,” says Hannah.

Among the changes implemented



PHILIP HOFFMAN AND LORENZO ARBAIZA WITH THEIR CATCH.



RELISHING FRIENDSHIP AND FALL BEAUTY ON A RECENT HIKING TRIP TO MOUNT WACHUSETT.



this year: the high school programs have been split into smaller cohorts, dividing students into smaller groupings for safety reasons. That restructuring, explains math teacher Matt Conant, builds on Valley’s small staff to student ratio. “We took a small setting and made it even smaller.” Additionally, remote and hybrid programming was created for students.

It helped that changing things up is something that happens regularly at Valley, says IEP coordinator Bobby Nimblett. “We’re used to having different things come at us.”

Staff say that the most dramatic change on display has less to do with programs than with the mindset of the students and their teachers, who are just happy to be back in the building. “People are less frustrated with little things,” says Matt. “We took for granted a year ago that we’d be able to see each other every day.” The relief at being back at school manifests itself in displays of healthy behavior. While staff initially worried that students might be resistant

to the new safety protocols involving masks and cleaning, that hasn’t been the case at all, says Hannah. “They are kind of willing to do those things automatically.”

That positive behavior by students gets rewarded at the end of each week with the option of participating in field trips or opportunities in the building. Recent adventures have included fishing in Billerica and hikes on Mount Wachusett. Of course, safety is now the major priority, says IEP coordinator Bobby Nimblett. In the old days, he and Assistant Principal Glen Costello could pile into a van with a group of students. Now, it’s one staff and three students per van, and everyone wears a mask. Bobby says that while hiking with a mask on takes some getting used to, the students have taken it in stride.

“They’re really appreciative that they’re able to attend school, and to get outside and be on a mountain with their peers,” says Bobby. “They’re really thankful for that.” ■

Transitional Middle/High School: Meaningful Support for Parents

When Valley's Middle and High School Transitional programs were forced to switch to remote learning last spring, Social Workers and Counselors had just days to figure out how to supply students and their families with essential supports. And they did. These skilled Valley staffers sprang into action, quickly figuring out what parents needed. "In those first weeks, we had constant communication with parents, much more than we were used to having," says School Counselor, Jen Schultz Bray. "It felt very enlightening and helpful."

This season's quick pivot to remote learning brought Valley staff and parents closer together.

The quick pivot online also presented Jen and her colleagues with an opportunity they'd never really had before, to get a close-up look at the lives of their students away from school. School Counselor, Jaclyn Squeglia, says that the experience was fascinating, and a useful tool for providing care. "I got a new lens on their lives, on how they handle stress. Now I can do more substantial work with them than I could before," says Jaclyn.

With the overwhelming majority of the students in the Transitional Program now back at school, the Social Workers and Counselors are taking that new perspective and putting it to use in order to better support students and their parents. This fall, Jen, Jaclyn and their colleague, Social Worker Ashley

McNamara, held a virtual parent support group in response to what they'd seen and heard from parents themselves. Explains Ashley, "For these parents, this has been an incredibly stressful time. We wanted to offer them some support, but also just let them know that we understand what they're going through."

Approximately twenty parents signed up for the training, which was offered once during the day and once at night. For the inaugural session of what the team plans to make a quarterly offering, they focused squarely on the emotional needs of the parents. "We focused on depression and anxiety and ways to take care of yourself," says Ashley. While the goal had been to offer an informative presentation, the parents ended up sharing their own experiences of stress and how they cope.

"Most importantly", says Jen, "the parents got to connect with one another. We wanted to give them that opportunity because they're dealing with similar situations. It's a way for us to help them feel less isolated."

While parent outreach has long been a priority within these programs, the pandemic has given it a new urgency, and created new opportunities for collaboration. In the past, for example, parent meetings were held at Valley, limiting who could participate. Now the trainings are being offered virtually. "The fact that parents can access support and information without leaving their homes is huge," says Ashley.

The parents who participated seem to agree. In feedback, they gave the training rave reviews, especially the opportunity to connect with oth-



SOCIAL WORKER, JEN SCHULTZ BRAY, THERAPIST ASHLEY MCNAMARA, SOCIAL WORKER JACLYN SQUEGLIA AND SOPHIE THE THERAPY DOG.

er parents. "Good to know everyone has a struggle and not just us," commented one parent. "It is helpful to hear what other families are experiencing, how they are managing, and ideas to implement in our house," said another. "All the resources and conversation were very helpful. Lets me know I am not alone in the difficult situation," commented a third.

Planning is already underway to offer another session in December. The topic will likely reflect suggestions from parents about topics they'd like to see addressed, including how to motivate students at home and how to encourage healthy eating away from school. "Being right there with them in their homes in the spring really opened our eyes to what our parents are dealing with," says Jen. "It feels really good to be able to offer them some meaningful support." ■

Adult Services: Making It Work

We're back! That's the message from Adult Services these days, after the pandemic forced a pivot to remote programming. Today, 25 Linnell Circle is humming once again as Valley staff and Individuals adjust to the new normal. For both adults and the staff who work with them, that's meant getting used to a different routine, and everyone is rising to the challenge.

Special delivery

While Adult Services has been open for business since early August, much is different these days. For Individuals who used to go out to a variety of work sites as part of a crew, safety concerns are now keeping them on site. That got job coach Joe Langlois thinking: what if there was a way to bring at least some of the work to 25 Linnell? Before the shutdown, Joe led a crew of Valley adults to the Bristol-Myers Squibb plant in Devens, where they sorted mail and packages for distribution throughout the facility. Now he travels to BMS on his own and brings the mail back for Individuals to sort. Working in two groups of two, they arrange the



COMING TO WORK NOW MEANS LOTS OF ATTENTION TO SAFETY. FROM RIGHT TO LEFT: BRENDA KENNEY, DAN SICARD, AND MIKE KEMPTON.

mail in alphabetical order, and sort by office number, using their own directories.

"They love it. It keeps them engaged and breaks up the day," says Joe. "Any little thing we can do to keep up that sense of normalcy is great." The idea, notes Joe, came from a BMS facilities manager, who approached Assistant Director of Transitional Services Matt Gentile. "BMS has been awesome," says Joe. Best of all, by focusing on a task that's similar to the work they'd been doing, the Individuals will be prepared when they are able to return to BMS. "Once we go back it won't be starting from square one."

Safe space

For the Individuals, the grounding of work crews during the pandemic has been

a major adjustment. But it has also required Adult Services staff members to get creative about their own work in order to keep the Individuals engaged. "Because there are no jobs right now, there are no job coaches," explains Bob Perkins. Until last spring, Bob would spend his days accompanying a crew to a worksite, an endeavor that took most of the day. Today things are different. "I feel like I'm more of an educator than I was before," says Bob.

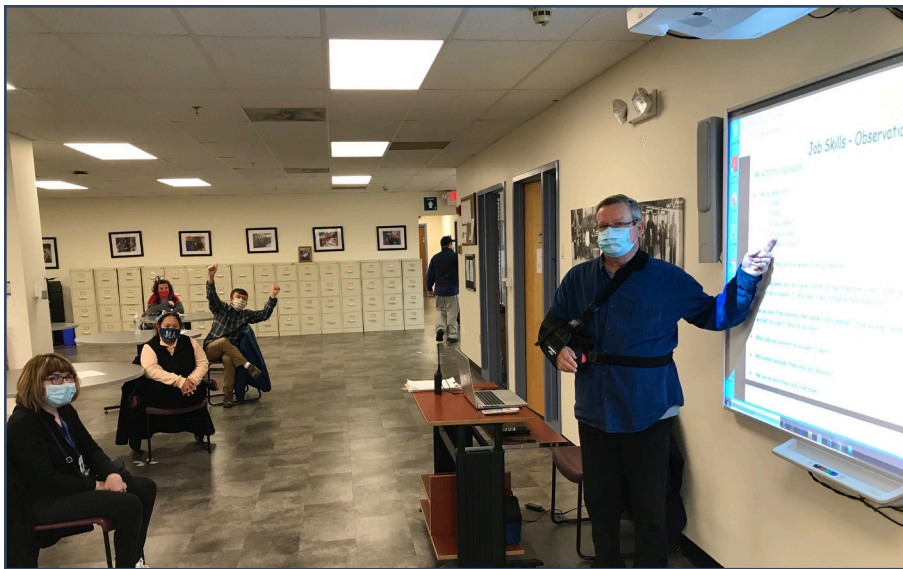
He starts his day going over job-related lessons and activities with a group of individuals, who remain in one classroom for safety. Then it's time for a Zoom lunch with the Individuals who remain at home. In the afternoon, Bob leads the students through activities related to the morning's theme, adding in a role-playing component.

From interviewing for jobs to dealing with a challenging co-worker, the scenarios are highly relevant, and not just to the work world.



ALANA CONNELL SORTING MAIL FOR BMS.

Adult Services: Making It Work



BOB PERKINS TEACHING, ERIN MCGRATH, SAWMARA NY, JOSEPH SEPE & LAUREN RIDDLE.

»continued from previous page

“They talk about themselves and how these issues translate into other situations in their lives,” says Bob. “It’s very interactive.”

Finally, it’s time for a new tradition that has quickly become a favorite: the Hour of Power, in which the Individuals select an activity or topic for further exploration. So far, the H of P has included karaoke, and “visits” to far-flung regions of the world, including Spain, France, and Rome for a tour of the Coliseum. “They choose what they want to do and we make it happen,” says Bob.

Staying connected

For the Individuals who are back on site, including some who are brand new to the program, the emphasis on classroom learning has been a hit. For those who’ve been unable to return to 25 Linnell Circle, remote teachers Cristen Tryder and Christine Joslin, both former job coaches, offer engaging activities remotely.

Until last spring, Cristen was in charge of a crew of Individual workers who went

to 3M. She’d bring them out to the job site and teach them job skills, including assembly. These days she balances her time between assisting Individuals who are on site and those who prefer to learn remotely, either because of health concerns or transportation issues. On Zoom sessions, she walks her students through a curriculum focused on improving their job skills. And at a time when

copying skills have never been more important, Cristen makes these a priority. During a group support hour, individuals talk about anything they’re struggling with. “A lot of them are struggling with the lack of routine or getting used to a different routine. They need that sense of normalcy,” says Cristen. “They want to be able to talk to their friends.”

It’s not just the Individuals Cristen is assisting right now. As hybrid coaches, Cristen and Christine Josline have also stepped up to offer help to her colleagues when they need help with technology issues. Kate Poulin, the Assistant Director of Adult Services, says that she’s been blown away at how Cristen and her colleagues have risen to the occasion. “They are being pulled in many directions, but are all hands on deck.”

A shout out to all of the Adult Services staff who’ve been “making it work”! On-site Staff: Brenda Kenney, David Ouellet, Bob Perkins, John Resteghini, Jonathan Taylor; Hybrid Staff: Christine Joslin, Joe Langlois, Cristen Tryder; Remote Staff: Alison Dunbar, Patricia Evans, Angela Fisette, Nikki Gounaris, Beth Tanguay, Katlyn Winch, Christopher Woodward. ■



LEFT TO RIGHT: LUCAS COSTAIN, DEREK PORCARO, ERIC HORAN, JOE PIRANIAN, SHANE O'BRIEN, COACH: JONATHAN TAYLOR (W/CLIP BOARD)

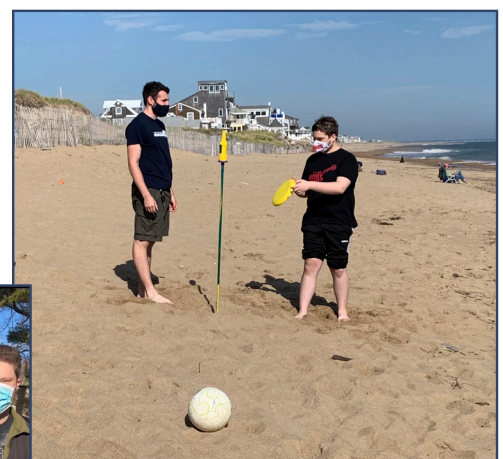
Fall 2020: So Glad to be Back!



LEFT: ELEMENTARY SCHOOL STUDENT AMELIA OLIVARES, RIGHT: TRANSITIONAL MIDDLE/HIGH SCHOOL STUDENT ELLIOTT URBAN WITH TEACHER JOHN SHEA.



LEFT: ALTERNATIVE MIDDLE/HIGH SCHOOL STUDENTS SHOW OFF THEIR MUMMY-WRAPPING SKILLS. LEFT TO RIGHT, ARE: KRISTIN WILSON (SP/LANG PATHOLOGIST), LORENZO ARBAIZA, AARON STADNYCK, SARILYN BABEU (HIDING IN THE BACK), HANNAH MORIARTY (ALT MS TEACHER), AVA MCMULLEN, AND BRADY SCHOFIELD (BEHIND AVA). RIGHT: NATE STEIGERWALD AND MARYALICE JACKSON



ABOVE: CALVIN MANDEVILLE (RIGHT) WITH TEACHER JOSH PLUNKETT. FAR LEFT: IN CLASS AT ADULT SERVICES WITH JOE PIRANIAN, SHANE O'BRIEN, PERRY CARAMANIS, CHUCKIE MACK, GREG MILNER (CLOSEST TO TV); CENTER: GREG MILNER (LEFT) AND DAN EASTWOOD ON THE BEVERAGE DELIVERY BEAT.

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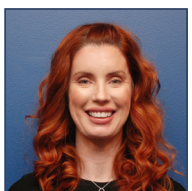
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Dr. Jay Lang
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Mr. Steven Stone
Superintendent, Dracut Public Schools

Dr. Laura Chesson
Superintendent, Groton-Dunstable Regional School District

Dr. Denise Pigeon
Superintendent, Nashoba Valley Technical School District

Mr. Brad Morgan
Superintendent, North Middlesex Regional School District

Mr. Christopher Malone
Superintendent, Tewksbury Public Schools

Dr. Michael Flanagan
Superintendent, Tyngsborough Public Schools

Mr. Everett (Bill) Olsen
Superintendent, Westford Public Schools

Elementary school. Those events create different opportunities for building better relationships.”

- “I feel that the staff are dedicated, kind hearted, and team orientated. The culture seems accepting and open, patient and respectful to all – both staff/administration and students. I feel that it is prioritized by management.”
- “Love the team atmosphere at Valley.”

I sincerely wish you a happy and safe holiday season. Please be safe and stay well.

My door is always open.

Chris
Chris A. Scott, Ph.D.
Executive Director

Much to be thankful for

»continued from cover

- 77% of staff reported feeling a sense of belonging to their school community. I have witnessed the staff in each of Valley’s many different programs become family. The tremendous amount of support and care they share with each other is very special.

When asked, “How do you feel about the overall morale/culture at our school?,” staff responded:

- “Excellent! The kids and staff as a community really benefit from events like Thanksgiving lunch here at Linnell and the Halloween dance at the