



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.3SI.NET

Technology & Security | Existing Conditions Report

INTRODUCTION

3Si visited the Northeast Metropolitan Regional Vocational High School on February 20, 2020 to review the Existing Conditions of the Technology and Security systems. 3Si met with the Director of Technology, and IT Staff.

The school was constructed in 1967 serving the communities of Chelsea, Malden, Melrose, North Reading, Reading, Revere, Saugus, Stoneham, Wakefield, Winchester, Winthrop and Woburn. The gross floor area is 240,138 ± SF with a student population of approximately 1,200 and approximately 190 staff.

Students attend academic and shop classes in weekly cycles.

The school currently has 16 career and technical education programs for students and adult education which include:

- Automotive Repair
- Automotive Technology
- Business Technology
- Carpentry
- Cosmetology
- Culinary Arts
- Dental Assisting
- Design and Visual Communications
- Drafting & Design
- Early Childhood Education
- Electrical
- Health Assisting
- HVAC & Refrigeration
- Metal Fabrication
- Plumbing & Pipefitting
- Robotics and Automation

The school has a S.T.E.M. program which offers select senior students an applied science focused experience utilizing raw materials and new technologies.



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.BSI.NET

Technology & Security | Existing Conditions Report

The purpose of this report is to comment on the general conditions of the following systems.

- A. Wired Network Tele/Data Infrastructure
- B. Wireless Network
- C. Voice Infrastructure and Phone System
- D. Video Distribution System
- E. PA/Intercom System
- F. Master Clock/Secondary Clock System
- G. Security Systems
 - Intrusion Alarm System
 - Access Control System
 - CCTV Video Surveillance System
 - Gunshot Detection System
 - Duress Alarm System
- H. Classroom Instructional Audiovisual Systems
- I. Speech Reinforcement Systems
- J. Large Venue Live Sound Reinforcement Systems
- K. Existing Vape Detection System
- L. Existing Computer Labs/Equipment



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.3SI.NET

Technology & Security | Existing Conditions Report

A. WIRED NETWORK TEL/DATA INFRASTRUCTURE

Premises Cabling:

All data cabling has been installed by in-house staff and students. Data cabling is a combination of Category 5E and Category 6 cables. Data cabling has been retrofitted over time to accommodate the school's growing need for technology.

The main IT Room (MDF/Head End Room) consists of server racks, a data cabling patch panel rack, and individual UPS units (Images 1, 2 & 3). The Head End Room is where the school's Verizon 1 Gb ISP Internet fiber is terminated. HVAC environmental control is inadequate for the MDF/Head End Room and fans are used to compensate for cooling (Figure 3).



Image 1

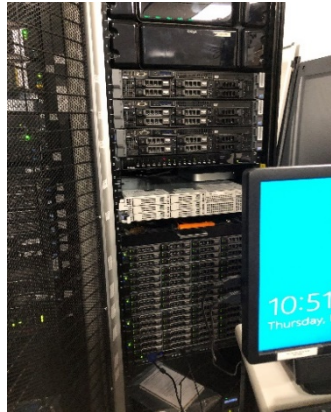


Image 2



Image 3

There are (12) Intermediate Distribution Frames (IDF) with an additional (2) planned. IDF's typically are wall-mounted cabinets/racks in various storage rooms, electrical closets, and in open areas in shops (Images 4, 5 & 6). New cabling and (2) IDF's are being added to accommodate the school's increased technology needs.



Image 4



Image 5

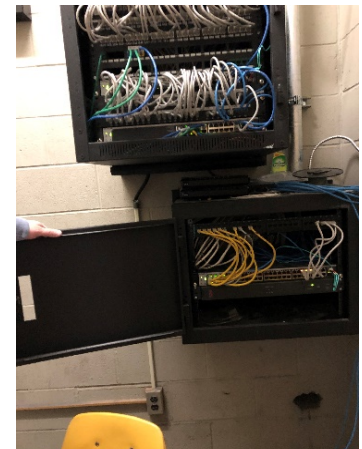


Image 6



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.BSI.NET

Technology & Security | Existing Conditions Report

The data backbone consists of OM4 multi-mode fiber from the MDF/Head End Room to the intermediate distribution frames (IDF) throughout the school.

It is recommended that the existing premises data cabling be replaced with a structured premise Category 6 or most current cabling system installed to EIA/TIA and BICSI standards.

MDF/Head End Room Equipment:

There is an existing SonicWall firewall and Palo Alto Networks cybersecurity management system in the MDF/Head End Room (Images 7).

The school has standardized on Dell servers and a Barracuda backup system (image 8),

The equipment is in excellent condition and can be re-used.



Image 7

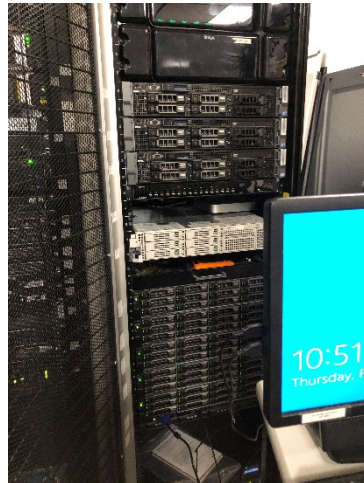


Image 8

Data Switches:

Existing data switches are Netgear 24 and 48-port non-PoE and PoE layer 2 & 3 stackable switches. The existing data switches are a mix of new to five-year-old switches.

It is recommended the existing Netgear switches be replaced with more capable layer 3 & 4 chassis and/or stackable PoE data switches in the new school design.



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.BSI.NET

Technology & Security | Existing Conditions Report

Classrooms:

Most of the data cabling in classrooms and instructional spaces typically is installed in surface mounted boxes and conduits/raceways (Images 9, 10, & 11).

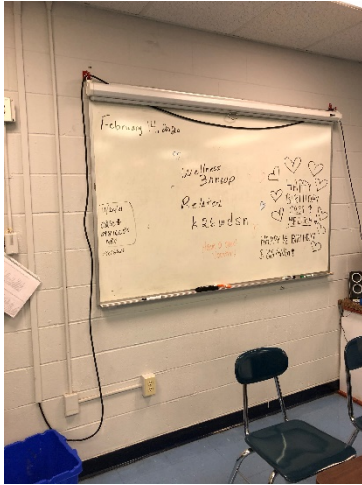


Image 9

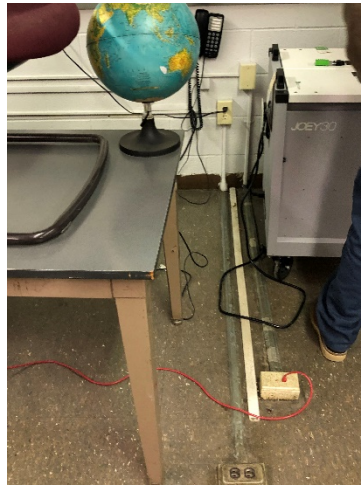


Image 10



Image 11

Typical classrooms have data outlets at the teacher location on the teaching wall, which are used in conjunction with audiovisual outlets for connection to overhead long throw video projectors (Images 12, 13 & 14).



Image 12

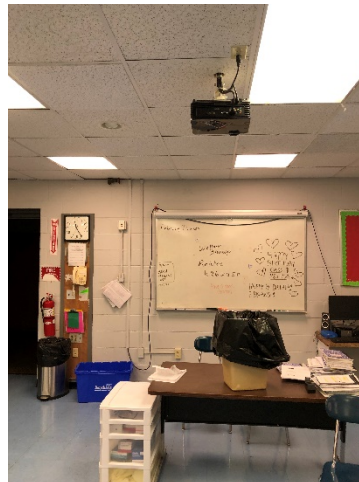


Image 13



Image 14



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.3SI.NET

Technology & Security | Existing Conditions Report

Computer Labs and computer clusters are hard wired to the school's data network. Use of power poles and/or dual channel raceways is typical in these locations.



Image 15



Image 16

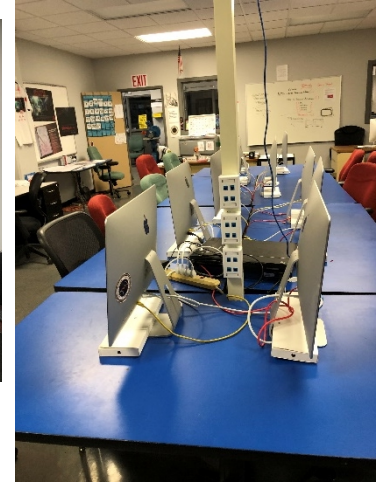


Image 17

B. WIRELESS NETWORK

The existing Wireless Network is the primary means for student access to the school's data network and to the Internet.

The school utilizes a Ruckus wireless controller and Ruckus access points. The school is in the process of upgrading the system to the latest version Ruckus ZoneDirector 3000 series wireless controller and upgrading and adding (88) more Ruckus Access Points. Access Points are installed on walls and on ceiling tiles.

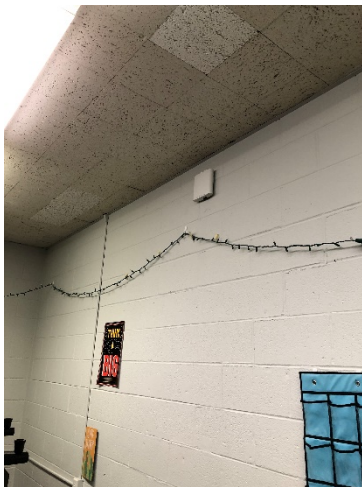


Image 18



Image 19



Image 20

The Wireless Network equipment is in excellent condition and can be re-used.



C. VOICE INFRASTRUCTURE AND PHONE SYSTEM

The existing voice system infrastructure consists of a combination Category 3, 5E, and 6 cabling. Telephone distribution frames are in various closets throughout the school (Images 21 & 22). The voice system is an on-premises Vertical Systems PBX (Image 23).



Image 21

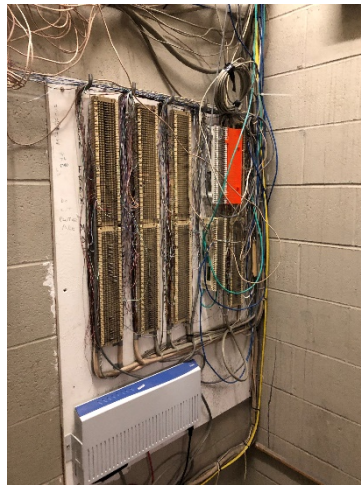


Image 22



Image 23

Phone handsets are Vertical VoIP and other manufacturers' digital and analog handsets. Phones are installed on desks in offices and on desks and on walls in instructional spaces (Images 24, 25, & 26).



Image 24



Image 25

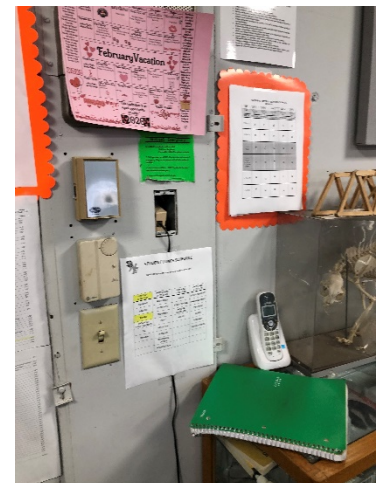


Image 26



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.3SI.NET

Technology & Security | Existing Conditions Report

The existing PBX system should be upgraded to an all VoIP system. VoIP phone handsets should be installed in all administrative offices, classrooms, shops, and common areas. However, the school's data infrastructure would need to be upgraded as noted above.

D. VIDEO DISTRIBUTION SYSTEM

There is no functioning school-wide Video Distribution system. The school does have Comcast video connections in offices, but not in classrooms. There is no capability to receive or to distribute live channels, broadcast live events, or to distribute pre-recorded video throughout the school.

It is recommended the school install a digital IPTV video distribution system utilizing the school's data network for video content distribution.

E. PUBLIC ADDRESS/INTERCOM SYSTEM



Image 27

The paging system head end located in the main office consists of general paging amplifiers, (2) 150 watt architectural acoustics amplifiers and an architectural acoustic MMA 800T 8-zone mixer with an adjacent Shure microphone for announcements (Image 27).

The system is located on top of filing cabinets and within a ventilated lockable enclosure. PA speakers are located throughout the building.



Image 28



Image 29



Image 30



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.3SI.NET

Technology & Security | Existing Conditions Report

Most of the room PA speakers are wall-mounted within a clock/speaker panel. Some spaces have surface mounted PA speakers (Images 28, 29, & 30).

The existing PA system has a significant number of speakers not working due to equipment and cable issues. PA volume in shop areas is a problem resulting in many complaints. Maintenance of the existing system has become more and more expensive due to the age of the system.

It is recommended that the PA system be replaced with a microprocessor-based paging system that will establish direct communications to the main office and between individual rooms. The PA system should be interfaced to the telephone system so that announcements can be made using any handset by authorized individuals.

F. MASTER/SECONDARY CLOCK SYSTEM

The existing Master Clock system is original vintage and consists of a Simplex Master Clock located in the Main Office (Image 31) and analog secondary clocks. Field devices are American Standard analog clocks installed in clock/speaker panels or stand-alone on walls (Images 32 & 33).



Image 31



Image 32



Image 33



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.BSI.NET

Technology & Security | Existing Conditions Report

Most classroom clocks are functional; however, some are not (Image 34) and have been replaced with battery type stand-alone clocks (Image 35).

Class schedule bell tones over the PA system are functional.



Image 34



Image 35

The master clock system is operational but beyond its useful life. The Simplex time controller is obsolete.

It is recommended the Clock system be upgraded due to its age to a wired or wireless GPS/LAN based clock system.

The Master Clock system would reside in the MDF/Head End Room.

G. SECURITY SYSTEMS

Intrusion Alarm:

The school has an existing Intrusion Alarm system comprised of door contacts and motion sensors in interior spaces. The motion sensors are functional.

It is recommended that the core intrusion system control panel be replaced with an addressable system capable of zoning and which would be capable of being interfaced to the Access Control system.

Access Control:

Visitor Door Intercom System:

There is an existing visitor door entry system consisting of video/audio Aiphone IX series door stations at the main entrances (Image 36) with electronic door latch hardware for remote door release.

Master stations are located at the security/welcome desks in the main entry lobbies (Images 37 & 38). The Aiphone system is in good condition and can be re-used.



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.3SI.NET

Technology & Security | Existing Conditions Report



Image 38



Image 37



Image 36

Proximity/Card Access System:

The existing Access Control system is by Johnson Controls. The system consists of Proximity/Card Readers, data base server and electronic door latches.



Image 39

There is an existing card/prox reader and an Aiphone audio/video station (Image 39) at the barrier gate to the Breakheart Reservation., a 640-acre hardwood forest located west of the site, which is accessed via the school's parking area.

The existing Access Control card/prox reader system is functional and the components could be reused. However, it is recommended that the Genetec CCTV system noted below be upgraded to the Genetec Security Center version so that CCTV and Access Control are fully integrated.



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.BSI.NET

Technology & Security | Existing Conditions Report

CCTV Video Surveillance System:

The CCTV system is a physically separate security network with separate racks and fiber run to each IDF for the network (Images 40 & 41).



Image 40



Image 41

CCTV cameras are a combination of approximately (12) legacy analog PTZ cameras and (108) High Def IP based fixed Axis single sensor and Arecont multi-sensor cameras. Resolution on the analog cameras is low. The IP cameras are approximately six years old.

The Video Management System (VMS) is a Genetec system. Genetec is a leading VMS system and if constantly upgraded to the latest versions can be re-used. The legacy CCTV cameras should be replaced with High Def IP cameras. The older IP cameras should be replaced with higher pixel/resolution cameras.

Gunshot Detection System

There is an existing Guardian Gunshot Detection system by Shooter Detection Systems LLC (SDS) recently installed by the Electrical Shop students. Sensors are installed in corridors and common spaces but not in classrooms.

Panic Button/Duress Alert System

The school expressed interest in installing a Duress Alert system for classrooms and shops in the new school design. The system would notify the first responder command center and mobile data terminals in less than a half a second with the exact location of the incident within the building. The system would consist of a wireless panic button system with mobile or fixed duress buttons, wireless transmitters, receivers, pulsing prism lights as well as a network computer application. The system would provide 2-way communications with first responders. The system can be interfaced to the PA / Intercom system, to a IP/TV video devices, to the Intrusion Alarm dialer, and to the mass notification system for phone, email and text notifications. The wireless system is a monitored system utilizing cloud-based supervision and management. The system utilizes 900 MHz Life Safety technology and does not rely on the school's data or a public wireless network to operate.



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.BSI.NET

Technology & Security | Existing Conditions Report

Visitor Managing System

There is an existing Hall Pass visitor management system. The system consists of the software data base, computer, license scanner, and badge printer. (Image 42).

Sign-in and sign-out takes place at the security/welcome desks at the main entrance lobbies (Images 43 & 44). The system can access national data bases to check on a visitor's criminal history. The Hall Pass system and hardware are in good condition and likely can be reused.



Image 42



Image 43



Image 44

H. CLASSROOM INSTRUCTIONAL AUDIOVISUAL SYSTEMS

The academic classrooms and shop instructional spaces have existing audiovisual systems for curriculum instruction. These systems typically are comprised of a desktop computer and a Long Throw ceiling mounted video projector which have been installed over six- or seven-years. The projectors project to white boards or pull-down projection screens. The video projectors are from various manufacturers. There are no interactive instructional audiovisual systems in the school.

The majority of the instructional audiovisual locations do not have in-wall cabling for the connection of the desktop computers to the video projectors. In most cases, the cabling to the desktop computer is run outside of walls. In some cases, electrical service for the devices is accomplished using power extension cords.

All of the audiovisual systems are used extensively for daily curriculum delivery in all subject areas. None of the audiovisual systems have an associated audio system. They utilize the projector built-in speakers, which is inadequate in the larger spaces.

It is recommended the existing instructional audiovisual systems be replaced with Interactive Flat Panel displays.



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.3SI.NET

Technology & Security | Existing Conditions Report

I. CLASSROOM SPEECH REINFORCEMENT SYSTEMS

There are no existing Speech Reinforcement systems in the school.

It is recommended Speech Reinforcement systems be incorporated in the new school design especially for general classroom size spaces. These systems would perform dual functions of enhancing speech intelligibility and would be used as the audio systems for the Interactive Flat Panel display systems.

J. LARGE VENUE LIVE SOUND REINFORCEMENT SYSTEMS



Image 45

The Cafetorium has a Local Large Venue Sound Reinforcement system. The system has fixed speakers mounted high on the side walls (Image 45).

The equipment is in fair condition.



Image 46

The Cafetorium has a motorized rear projection screen mounted behind the top of the platform proscenium.

There is a video projector located on the back wall of the platform (image 46).

The video projector appears to be interfaced to the live sound reinforcement system.

The existing equipment is in fair condition.



CORPORATE OFFICE
168 MAIN STREET
NORTHFIELD, MA 01360
V 413.498.0069
F 413.498.4386
WWW.BSI.NET

Technology & Security | Existing Conditions Report



Image 47

The Gymnasium has a recently installed Large Venue Local Sound Reinforcement system. Speakers are wall-mounted (Image 47).

The equipment is in good condition.

K. EXISTING VAPE DETECTION SYSTEM

The school has a Vape Detection system using FlySense detectors by Soter Technologies. The system consists of (16) sensors installed in gang toilets. The system was installed approximately one and a half years ago.

The sensors have the latest version firmware.

L. EXISTING COMPUTER LABS/EQUIPMENT

There are four hard wired Computer labs including a recently installed Apple iMac lab for Graphics Design and Visual Arts. An additional Computer lab is planned for an Engineering Project Lead the Way design lab.

Teachers and instructors use desktop computers and have access to a Chromebook.

There are (30) mobile Chromebook carts for approximately 900 student Client Devices

Most of the client devices are in fair to good condition. The quantity of devices that could be reused in the new school is difficult to determine at this time. The major factor is the construction/renovation schedule which will determine when the new school will be occupied.