

TECHNOLOGY ASSESSMENT

Hanover High School

Our observations during the site visit relative to existing technology in this facility are presented for your use, review and consideration.

GENERAL BUILDING:

In this section we present our observations of the physical building and structure relative to its supporting of technology. Any commentary made about building materials and related items is made from the perspective of its relationship with and to technology, not on its condition, suitability or other capability. Comments and assessments from other engineering disciplines for these areas are included in other sections of this report.

The building is a 1958 multiple story building with block walls. The construction of the interior block walls has resulted in surface mounted wiring. Horizontal distribution has been done above the suspended ceilings along corridor locations.

For this study, we present our observations by categories that have shown to be beneficial in clearly showing the relationship and function of technology. The categories of the physical infrastructure will be presented first, followed by the various systems and components. For example, the voice wiring observations will be presented in the infrastructure, but the telephone system and instruments will be presented in the voice systems.

INFRASTRUCTURE:

In today's schools, the term infrastructure is applied to the cable, wire and systems installed to provide the capability to connect technology devices for access to resources. To be more specific, the typical and common educational infrastructure would be comprised of the wiring for the telephone and public address system, the data network and the video network. This is generally referred to as the voice, video and data network. The person reading this report may want to think of this area as the physical wiring and cabling that is in the walls and not readily seen. This is also the area that is typically the hardest and most costly to deal with "after the fact." The infrastructure is not limited to these topologies and technologies.

VOICE INFRASTRUCTURE:

The Hanover High School has an older limited voice infrastructure in place. The infrastructure is installed with separate infrastructure wiring systems, one to support a small telephone system and the other to support intercom and public address functions. There is wiring in place to a combination clock/speaker unit in the classrooms.

VIDEO INFRASTRUCTURE:

The Hanover High School has no current video distribution wiring system in place. A cable television franchise feed and interface is installed and operational in one of the labs. This

serves to provide distribution of information over the local cable channel. The building was wired earlier to accommodate “Channel One” video distribution. Presently this service is not being utilized in the building.

DATA INFRASTRUCTURE:

The Hanover High School has a limited data infrastructure in place. We observed surface mounted data cabling outlets at locations throughout the facility. The typical classroom has one (1) data drop located at the “front” of the room for a teacher device and one data drop located at the “back” of the room for a student device. There are a couple of labs in the building with higher drop counts. For example, the Business lab has twenty-six (26) PCs networked with hubs. Another lab is set up similarly achieving the desired number of drops / connections by make use of hubs as opposed to providing wired home-run connections. The library has eight (8) networked locations. The typical office has one (1) data drop per person with some additional drops for printers and other devices. There are no drops in the various common spaces such as the auditorium, cafeteria and gymnasium. The placement of the data drops reflects the ability to install the infrastructure given the material composition of the walls and the layout of the facility.

The current data infrastructure was installed approximately three (3) years ago as part of the State’s NetDay program. It is a mix of category 5 and category 3 cabling. An estimate would be that the percentage of category 5 cabling is 80%. The data drops emanate from wiring distribution locations in the Server room and the main office area. These locations are connected via fiber optic cabling.

The selection of these locations and the layout of the existing wiring infrastructure and how this is accomplished highlight the considerations that must be given to infrastructure wiring. Understanding the limitations of the various topologies relative to price and performance is important. Consideration for distance limitations must be taken. The current wiring distribution locations points out one of the issues associated with a facility that was not originally designed to accommodate facility-wide technology cabling and wiring.

SYSTEMS AND COMPONENTS

VOICE SYSTEMS:

The voice technology system in the Hanover High School is a mix of communications equipment from various manufacturers/vendors. The intercom and public address is a separate system that has a handset in the classroom along with a separate wall speaker. The commentary about the system is that it works well but has intermittent failures. Two administrators carry cell phones for communications.

The telephone system is a separate AT&T Merlin hybrid switch. There are a limited number of telephone instruments in the building, mainly in office areas. There are approximately five

(5) external telephone lines for the building. There is no voice mail or automated attendant system installed in the building.

VIDEO SYSTEMS:

There is no current building-wide video wiring in place. There is Channel One distribution equipment and a head-end for local cable access. Therefore, there is no video head-end distribution equipment/system as is currently installed in schools in place. The school does show videotaped items over the Channel One network and equipment.

There is an MCET satellite dish on the property.

There are approximately six (6) television monitors with VCRs on carts. We found no permanently mounted video monitors.

There are two (2) portable EIKI data / video projectors in use in the building.

DATA SYSTEMS:

The current data infrastructure is supported at the wiring distribution location by category 5 devices. The devices include a mix of older and newer patch panels, 10/100 switches, workgroup hubs, 10Base-T hubs, switch and fiber optic modules.

All devices are industry standard devices and match the configuration and layout.

Components observed were Chipcom, Asante, Netgear, 3Com.

As stated previously the current wiring distribution locations are spaces/areas that were not originally designed for these functions.

In order to achieve the density of network connections in labs and other locations, local hubs have been installed.

TECHNOLOGY COMPONENTS:

The school is predominantly PC based. The typical classroom configuration has one (1) workstation, typically for the teacher. Some of the rooms have a printer. There a couple of technology labs. The Business lab has twenty-six (26) workstations. There is another lab that has some older PCs in it. The library has eight (8) workstations. Workstations are PCs and clones provided by various vendors. Printers from different manufacturers are in place. The workstations and printers are of varying ages and configurations. We did observe some IMacs and IBook with a Lexmark printer in the Physics lab. In the music area there is a configuration of equipment that included six (6) Korg X5D Midi keyboards with an IMac.

MASTER CLOCK SYSTEM:

A master clock system by Simplex is installed in the main office. The system is rated as fair in performance with an average of six (6) clocks failing per year.

INITIAL COMMENTS & RECOMMENDATIONS:

INFRASTRUCTURE:

The data infrastructure in place does provide capabilities to the different areas of the building. A review of the number of data outlets / drops would be desirable. There are a very limited number of drops in place with the solution to additional drops being hubs. The current physical structure of the building does not make additions to this network easy. The main wiring distribution locations function adequately given the conditions. In their present condition, there are drawbacks (location of equipment, environmental issues, expansion limitations, etc). We would look at options during a renovation / addition to address these issues. Again, we recognize that someone had the creativity to utilize these spaces as they have. We realize that current building options are limited and this is why these alternatives were chosen. A renovated facility would provide for designed wiring locations and enable a comprehensive and complete data infrastructure to be in place. This infrastructure could allow for a greater density of technology outlets in all classrooms and spaces through the facility. The cost to do this during renovation or addition is far less than a piece-by-piece approach with the current facility conditions. Dependent upon what direction and scope the project would take, consideration would be given as to the feasibility of retaining the existing infrastructure.

We are concerned about the current level of cabling in the building. As technology requirements and devices move forward in terms of speed and bandwidth capabilities, the mix of category 5 and category 3 cabling will become an issue. This is especially true for the 20% of the wiring locations that are category 3 cabling. It would be our recommendation to identify the rooms and areas currently being supported by the category 3 cabling.

It would be our recommendation to provide a dedicated technology outlet for the teacher / instructional person in each space. This drop would encompass not only data but video and other technological capabilities as well. For example, this would allow for the display of information on the teacher's workstation to be viewed on a permanently mounted large screen monitor or projection screen in the room. We would also recommend that a review of the number of drops per room be undertaken. This would provide confirmation of the resources desired and required in each location.

There should be an analysis of and plan for the video infrastructure. Consideration should be made regarding this topology and its potential offerings to the students and staff. Educational video programming and bi-directional programming are powerful educational tools. Discussions with the local cable television access group and /or franchisee should take place so that services could be provided to the facility that are in line with those being provided to other educational institutions. We do not believe that the existing Channel One system has benefits going forward.

The voice infrastructure in a new or renovated facility would be designed and installed in such a manner as to provide support for telephone instruments in all instructional locations and incorporate the intercom and public address functions as well as the inclusion of current voice technologies and advances.

SYSTEMS:

All of the systems for all of the technologies would be reviewed as part of a renovation or new facility project.

The current network system equipment would be replaced with newer higher speed systems in a redesigned head-end location. The existing equipment would be evaluated as to re-purpose or other functionality. We would recommend that most of the systems in place for the topologies currently in place be replaced or upgraded to the extent possible.

There are no video distribution system components in place. An adequately designed video head-end should be installed to provide true educational video functionality. This would allow for information from various and different information sources to be received and utilized in the classrooms and other locations in the building.

The voice systems would be reviewed for functionality and the ability to provide intercom and public address system functionality along with the telephone system requirements and other communications advances. It is anticipated that the current systems would not meet the needs of the school and would be replaced. This would include replacement of the current handsets in the rooms.