REPORT ON AUTOMATED EXTERNAL DEFIBRILLATOR DENSITY IN VIRGINIA's COMMERCIAL AND RESIDENTIAL BUILDINGS

November 2021

Executive Summary:

Today's automated external defibrillators (AEDs) are self-operating, safe, and relatively easy to use, even by untrained lay rescuers. Because the modern AED can be used by the untrained public, Virginia deregulated AED use in 2003. In an effort to gather more information about AED density in buildings across the commonwealth, item 116 of the 2020 Budget Bill (HB 30) directed the Department of Housing and Community Development (DHCD) to convene a workgroup to study the ideal AED density in commercial and residential buildings. DHCD convened a workgroup of public and private industry representatives to develop a survey on current AED density and usage in the commonwealth. The survey was sent to the occupants of commercial and residential buildings across the commonwealth and received 184 responses.

Within commercial buildings, the vast majority of respondents (77.4%) reported having at least one AED. These numbers varied widely across industry groups however, with 100% of correctional facilities (as required by law) and 88.5% of schools having AEDs, but only 11.5% of retail, restaurants, and other businesses. While it is difficult to draw specific conclusions from the data, correctional facilities, retail, restaurants, and other businesses tend to have one AED per building, while schools have one or two per building, with some having an AED on every floor. Within residential buildings, only half of respondents reported having an AED in their facilities, and most reported a density of one AED per building. Respondents in both commercial and residential buildings referenced the American Heart Association's guidelines of a three minute response time (90 seconds away from any emergency) when asked what rules, standards, or policies governed AED density and placement.

The survey suggested at least some perceived need for more AEDs across all industries and building types. However, many respondents were concerned about the cost of installing and maintaining AEDs, and there is little to no outside financial support for increasing AED density. Respondents in retail, restaurants, and other businesses indicated that AED/square foot would be a useful density measurement for AEDs, while respondents in correctional facilities indicated AED/inmate, schools indicated AED/floor, and residential buildings indicated AED/number of rooms.

Background:

Purpose and use of AEDs

An automated external defibrillator (AED) is a lightweight, battery-operated, portable device used to revive someone from sudden cardiac arrest caused by either ventricular tachycardia (a dangerously fast heartbeat) or ventricular fibrillation (an irregular heartbeat).[1] AEDs treat sudden cardiac arrest by checking the heart's rhythm and sending an electrical shock

[1] Mayo Clinic Staff, *Automated External Defibrillators: Do You Need an AED?*, MAYO CLINIC (Apr. 16, 2020), https://www.mayoclinic.org/diseases-conditions/heart-arrhythmia/in-depth/automated-external-defibrillators/art-20043909.

to restore a normal rhythm if needed.[2] When combined with CPR, which will keep blood flowing to the heart and brain for a short time, the shock will help restore a regular heart rhythm until professional medical help can arrive.[3]

The potential life-saving effects of applying an AED are well-documented. A large number of scientific studies have confirmed that survival rates increase by approximately 25% in those persons who receive a shock from a lay rescuer with an AED before emergency medical services arrive compared with those victims shocked after their arrival at the scene.[4] When applying an AED, time is of the essence, as survival chances decrease by 7-10% for every minute that an AED is not applied.[5] However, studies have indicated that bystanders rarely use AEDs, applying them to only approximately 15% of victims who were suffering from sudden cardiac arrest.[6] Furthermore, less than 10% of out-of-hospital sudden cardiac arrests occur within 100 meters of an AED.[7]

Despite this low application rate, today's AEDs are self-operating, safe, and relatively easy to use, even by untrained lay rescuers.[8] Lay rescuers are guided by audible prompts from the AED itself as well as graphical directions on the device.[9] Although AED design differs somewhat by manufacturer, the basic elements of application and use in a case of sudden cardiac arrest are the same and include the following: 1) the user is instructed to turn the device on and to bare the patient's chest; 2) the defibrillator pads must be opened and their protective backing removed; 3) the pads are then positioned on the patient's chest according to the graphics shown on the AED, 4) the AED then analyzes the patient's cardiac rhythm, and if a shockable rhythm is detected, the user is instructed to press a button that delivers the defibrillatory shock.[10]

AED regulation in Virginia

Because the modern AED can be used by the untrained public, Virginia deregulated AED use in 2003. HB 1860 (2003) repealed Va. Code § 32.1-111-14:1, which eliminated the requirement that owners register AEDs along with the requirement that Board of Health establish a registration program with approved training procedures.[11] The bill also amended Va. Code § 8.01-225, Virginia's "Good Samaritan Law," by removing language requiring registration of AEDs and training from its immunity provisions.[12] The effect of this bill is that AEDs can be owned and placed in any building without registration, and any person who, acting in good faith,

---

[2] Id.
[3] Id.
[4] William J. Brady, *Lay Responder Use of Automated External Defibrillators,* SUDDEN CARDIAC ARREST FOUNDATION, https://www.sca-aware.org/about-sudden-cardiac-arrest/be-prepared/aed-deployment (last visited Nov. 1, 2021).
[5] *AED 101*, EMS SAFETY SERVICES, INC., https://www.emssafetyservices.com/how-to/aed-101/ (last visited Nov. 1, 2021).
[6] William J. Brady, *Lay Responder Use of Automated External Defibrillators,* SUDDEN CARDIAC ARREST FOUNDATION, https://www.sca-aware.org/about-sudden-cardiac-arrest/be-prepared/aed-deployment (last visited Nov. 1, 2021).
[7] Id.
[8] Id.
[9] Id.
[10] Id.
[11] 2003 Va. Acts, Chapter 978. The text of this Act can be found in Appendix C.
[12] Id.

uses an AED to render emergency care is shielded from most civil liability under Virginia law for any resulting injuries.

These registration and training requirements were the main forms of regulation of AEDs in Virginia when the law was repealed. Currently, there are only a handful of other laws and regulations that govern AED placement and training requirements. First, only local and regional jails are required to have an AED by regulation,[13] and the density is set to "a minimum of one AED unit… in the facility."[14] Second, while statute allows each local school board to develop a plan to allow for the placement of an AED in every school, this plan is not required by the commonwealth.[15] Finally, only teachers,[16] bus drivers,[17] and security staff at local and regional jails[18] are required to receive training in how to use an AED.

AED regulation in other states and by the federal government

Other states have enacted a patchwork of AED requirements that typically focus on placing AEDs at schools, dental offices, and, to a lesser extent, health clubs, nursing homes, and assisted living facilities.[19] Regardless of whether other states require AEDs in certain buildings, many, like Virginia, have also chosen to provide immunity from civil liability for lay rescuers who use AEDs, though these provisions are by no means uniform.[20] As in Virginia, density requirements are typically set at a minimum of one per facility or building.[21] Even in states where the size of the building is taken into account, such as Oregon (which requires AEDs in any "place of public assembly" larger than 50,000 square feet), the statute only requires "at least one" AED in these places.[22] At the federal level, the Food and Drug Administration regulates

[13] It appears that the Board of Dentistry does not require dentists who administer deep sedation, moderate sedation, and general anesthesia to have an AED in their offices, but instead gives dentists the option to have either a manual defibrillator or an AED. 18 VA. ADMIN. CODE § 60-21-301 (2021) requires an "external defibrillator (manual or automatic)" when administering deep sedation or general anesthesia, and 18 VA. ADMIN. CODE § 60-21-291 (2021) simply requires a "defibrillator", which can presumably be either manual or automatic, when administering moderate sedation. Given these specific language differences and the fact that defibrillators in dentists' offices are intended for use by the dentists themselves, not the lay public, we do not consider these regulations to require AEDs in dentists' offices, though the effect may well be that all dentist offices have an AED.

[14] 6 VA. ADMIN. CODE § 15-40-405 (2021); 6 VA. ADMIN. CODE § 15-40-10 (2021) defines "Facility" broadly as "the actual physical setting in which a program or agency functions."

[15] VA. CODE § 22.1-274.4 (2021).

[16] VA. CODE § 22.1-298.1 (2021).

[17] VA. CODE § 22.1-178 (2021).

[18] 6 VA. ADMIN. CODE § 15-40-405 (2021).

[19] EHS Daily Advisor Staff, *What state Plan States Require AEDs in the Workplace?*, EHS DAILY ADVISOR (Mar. 5, 2021), https://ehsdailyadvisor.blr.com/2021/03/what-state-plan-states-require-aeds-in-the-workplace/.

[20] *AED Laws by State*, AED UNIVERSE, https://www.aeduniverse.com/AED_Laws_by_State_s/97.htm (last visited Nov. 1, 2021); *compare* Arizona law (protecting a specific subgroup of people from liability), *and* Arkansas law (protecting any person who uses an AED "in good faith and without compensation"), *with* Maine law (protecting any person or entity that acquires an AED, the owner of the property where the AED is located, any person who retrieves an AED, and any person who uses, attempts to use, or fails to use an AED in a cardiac arrest emergency).

[21] *See, e.g.*, FLA. STAT. § 429.255(3)(a) (2021) (certain assisted living facilities must have "on the premises… a functioning automated external defibrillator").

[22] OR. REV. STAT. § 431A.455(2) (2021).

AEDs and any necessary accessories and must approve their safety before they are sold.[23] The agency maintains a list of approved AEDs.[24]

Workgroup on AED Density:

Enabling legislation

Item 116 of the 2020 Budget Bill (HB 30) directed the Department of Housing and Community Development (DHCD) to convene a workgroup to study the ideal AED density in commercial and residential buildings. The provision reads:

> "A. The Department of Housing and Community Development shall establish a workgroup to study the ideal Automated External Defibrillator (AED) density in commercial and residential buildings. The Department shall report its findings to the Chairs of the House Appropriations Committee and the Senate Finance and Appropriations Committee on or before November 1, 2021."[25]

When determining the scope of the legislation that called for this report (and thereby who should be invited to join the workgroup), it was necessary to define "commercial and residential buildings" because there is no set definition within Virginia's Uniform Statewide Building Code or the International Building Code. The closest definition is located in the Virginia Energy Conservation Code (VECC), which defines "Residential Building" as "detached one- and two-family dwellings, and multiple single-family dwellings (townhouses), and Group R-2, R-3, and R-4 buildings three stories or less in height above grade plane,"[26] and "Commercial Building" as "all buildings that are not included in the definition of 'Residential Building'".[27]

By combining the VECC definition with a more common understanding of what commercial and residential buildings are among those who develop the Virginia and International Building Codes, the following definitions of commercial and residential buildings were developed for purposes of this report:

- Residential buildings are buildings occupied for sleeping purposes, except institutional occupancies, one and two-family dwellings, and townhouses. Residential buildings include but are not limited to the following: multifamily dwellings (three or more dwellings), apartments, hotels/motels, lodging houses, boarding houses, and dormitories.
- Commercial buildings are buildings that are not included in the definition of "Residential building", except one and two-family dwellings and townhouses. Commercial buildings include but are not limited to the following: institutional, business, mercantile, storage, factory, educational, assembly, and utility buildings.

Composition of the workgroup and development of the survey

DHCD convened a workgroup of stakeholders, developed a survey that asked about current and potential AED density, requirements, and usage, and sent the survey to potentially

---

[23] 21 C.F.R. § 870.5310 (2021).
[24] *Automated External Defibrillators (AEDs)*, FOOD AND DRUG ADMINISTRATION (Apr. 7, 2021), https://www.fda.gov/medical-devices/cardiovascular-devices/automated-external-defibrillators-aeds.
[25] For the full text of the provision, see Appendix B.
[26] VA. ENERGY CONSERVATION CODE § C202 (2015).
[27] Id.

affected groups.[28] This report summarizes the results of that survey.[29] In soliciting members for the workgroup, DHCD sought to include those who occupy commercial and residential buildings, those in the health profession who provide training for and regularly use AEDs, and those who represent employee interests generally. Invitations were extended to a mixture of representatives from the private and public sectors. The final workgroup was comprised of the following individuals:

- Beverly Rebar from the State Council on Higher Education for Virginia
- Robert Melvin of the Virginia Restaurant, Lodging, and Travel Association
- Marsha Stanford of the Virginia Department of Corrections
- Jen Armstrong of the Virginia High School League

The workgroup's initial meeting was held on September 24, 2021, to discuss issues surrounding AED density standards and develop survey questions. The survey was completed on September 29, 2021, and broadly disseminated to all of the representatives who were invited to join the workgroup, regardless of whether they ultimately joined the workgroup. The survey closed on October 15, 2021.

Survey Results and Findings:

Demographics of survey respondents

There were 184 responses to the survey, with 151 complete responses and 33 partial responses.[30] The largest response group was education, with primary, secondary, and post-secondary schools making up 56.5% of respondents. Correctional facilities made up 13.6%, while retail, restaurants, and other businesses made up 14.6%, and travel, lodging, and campgrounds made up 10.8%. Therefore, 84.7% of respondents occupied commercial buildings and 10.8% occupied residential buildings. The remaining respondents either chose not to disclose their industry or represented the interests of an industry in the aggregate.

Current AED density in Virginia: commercial buildings

Within commercial buildings, a significant majority of respondents (77.4%) reported having at least one AED. These numbers varied widely across industry groups however, with 100% of correctional facilities (as required by law) and 88.5% of schools having AEDs, but only 11.5% of retail, restaurants, and other businesses. The number of AEDs reported ranged from 683 across an entire school district, as many as 15 in other primary or post-secondary school buildings, between one and twelve in correctional facilities, and one in most commercial spaces and restaurants.

Generally speaking, respondents in commercial buildings did not know the exact density of AEDs across their facilities and buildings. Those that did know reported a variety of numbers and measurements. To the extent that conclusions can be drawn from this data about current AED density in commercial buildings, correctional facilities, retail, restaurants, and other

[28] For the full text of survey questions, see Appendix A.
[29] For a report of the full survey responses, see Appendix A.
[30] Because there was a high rate of partial responses and some responses, while considered complete by the survey software, did not adequately answer the question asked, reported numbers may not add to 184 responses or 100%.

businesses tend to have one AED per building, while schools have one or two per building, with some having an AED on every floor, and a few having time or people-based density requirements such as "enough to satisfy the 3-5 min response time," or "2 per 450 people." Other respondents indicated having a certain number of units, often portable, designated for outdoor use. Two respondents reported using a square footage density requirement of one AED for every 21,000 square feet and one for every 25,000 square feet, respectively.

The survey also asked respondents what rules, standards, and policies govern the placement of their AEDs in an effort to determine whether there are standards outside of laws and regulations that govern AED placement. Within commercial buildings, correctional facilities reported having internal policies governing the placement and accessibility of AEDs.[31] Several schools referred to the American Heart Associations' (AHA) standards, which recommend a three minute response time (90 seconds away from any emergency),[32] school board policies, or to the National Athletic Trainer's Association guidelines for AEDs at athletic events. Many also expressed a desire to adhere to specific response times when placing AEDs. Suggested times included less than two minutes, less than 90 seconds, or three to five minutes from any location, though respondents did not always reference where those standards came from. One secondary education respondent reported using "density of people on our campus and the likelihood of choking and other secondary causes of cardiac arrest to inform our placement," and another also cited "strategic placing based on risk and possible need". There were no responses to this question from retail, restaurants, and other businesses.

Current AED density in Virginia: residential buildings

Within residential buildings, only half of respondents (10 out of 20) reported having an AED. Within those, 80% reported having only one or two AEDs in their facilities, with one convention center/hotel having 12 and one lodging facility reporting 15. Respondents in residential buildings also generally did not know the exact density of AEDs in their facilities, with only one respondent reporting that they have an AED every "1000 feet". Four respondents entered a density value of "1", which could be interpreted as one AED per building since residential operations, unlike schools and correctional facilities, are generally located within the same building on a given property. In residential buildings, respondents also referenced the AHA as well as corporate brand policies when asked about other rules, standards, or policies that govern the placement of their AEDs.

S***uggested density requirements: survey responses***

At the end of the survey, respondents were asked whether there is a perceived need for a larger, smaller, or similar number of AEDs in their industry, and then asked to provide what they

[31] It is unclear whether these policies are required by the Department of Corrections, as some respondents referenced "DOC Policy" and others referenced their own operating procedures or guidelines.

[32] *Implementing an AED Program*, AMERICAN HEART ASSOCIATION (May, 2018), https://cpr.heart.org/-/media/CPR-Files/Training-Programs/AED-Implementation/Implementing-an-AED-Program-ucm_501521.pdf ("Effective AED programs are designed to deliver a shock to a victim within three to five minutes after the person collapses. Use a three-minute response time as a guideline to help you determine how many AEDs you need and where to place them. AEDs can be placed near elevators, cafeterias, main reception areas, in secured or restricted access areas and on walls in main corridors").

believe would be a useful density measurement for their industry. Responses to these questions varied widely by industry within commercial and residential buildings, and there does not appear to be a generally agreed upon density measurement in buildings where AEDs are not required. Therefore, this section provides a broad summary of those qualitative responses by industry.[33]

Within retail, restaurants, and other businesses, seven out of fifteen respondents indicated a need for more AEDs, while three indicated fewer are needed, and two stated they have not seen a need for AEDs within their industry at all. Three respondents indicated that they have "no idea" or that the need for AEDs is "unknown". Suggestions for density measurements within retail, restaurants, and other businesses from most suggested to least included square footage, occupancy (with one suggestion of one AED per 5,000 people), and number of floors. Further suggestions included requiring AEDs in certain amenity areas, such as the gym within an office building.

Within correctional facilities, an almost even number of respondents indicated that more AEDs are needed (10 out of 23) and a similar number are needed (9 out of 23). One respondent indicated fewer AEDs are needed, while three indicated that the need is unknown. Suggestions for density measurements within correctional facilities from most suggested to least included number of inmates, one per building, one per dormitory, and number of rooms in the facility. Several respondents stressed that the density should also take into account the configuration of the facility and the distance someone must travel with the AED. One respondent cautioned that any density measurement should also include an assessment of "how quickly [an area] could be accessed through Security."

Within educational facilities, 44 out of 79 respondents indicated a need for more AEDs, while 25 indicated a similar number are needed, and five indicated fewer AEDs are needed. Five respondents also indicated that the need is unknown. Suggestions for density measurements within educational facilities from most suggested to least included number of floors (almost twice as popular as the next suggestion), occupancy limits/building capacity, square footage (often combined with number of floors for a measurement that would lead to more than one AED per floor), and a time-based requirement ranging from a 90 second to five minute response time. Many respondents noted that the density should be different based on building usage and function, with several indicating that the number should be different for indoor and outdoor facilities, namely classrooms versus athletic facilities.

One respondent stated that AEDs should be required in schools, while another noted that a requirement would be cost-prohibitive. For educational facilities, there was also a significant number of respondents who seemed to be frustrated by the fact that there is not a standard density for AEDs in schools. These respondents indicated that having a standard would be welcomed by school administrators, with one stating "if there were a standard like fire extinguishers, it would help."

Within residential buildings, five out of thirteen respondents indicated a need for more AEDs, while three indicated that the current number is sufficient, and four indicated fewer AEDs are needed. One respondent indicated that the need is unknown. Of the five respondents who suggested that more AEDs are needed, there was a general consensus that each building needs at

[33] For the full text of these responses, see questions 13 and 14 in Appendix A.

least one AED. Suggestions for density measurements within residential buildings from most suggested to least included number of rooms (with suggestions for one AED per 300 rooms and one per 150 rooms), one per building, square footage, and occupancy. One respondent representing a hotel pointed out that the measurement should be based on number of rooms per floor, not per building, as every hotel has a different floor plan.

Suggested density requirements: medical associations

Even though there does not appear to be a generally agreed upon density measurement in commercial and residential buildings, many respondents mentioned the AHA in their responses. As mentioned above, the AHA has stated that AEDs need to be applied within three to five minutes after a person collapses.[34] Therefore, the AHA recommends building owners use a three-minute response time (90 seconds away from any emergency) when determining how many AEDs to purchase and where to place them.[35] EMS Safety Services Inc, a leading provider of emergency response training courses and supplies, also recommends that an AED be applied within three minutes of cardiac arrest.[36] This time-based requirement could be a useful measurement when combined with another measurement based on the physical characteristics of the building, especially since many respondents are already aware of the AHA's guidelines.

Both the AHA and the Sudden Cardiac Arrest Foundation (SCAF) also emphasize that AEDs are only useful when placed in public places that are accessible during all hours and where there is a reasonable probability of a witnessed cardiac arrest.[37] Other best practices recommended by the SCAF include placing AEDs in locations such as airports, rail terminals, casinos, sports arenas, and buildings in which larger number of persons at risk for cardiac arrest frequent, and in locations in which there is at least one cardiac arrest event every five years.[38]

Barriers to increasing AED density

While developing the survey, members of the workgroup expressed concern over a potential increase in costs for both installation and maintenance if AED density were to be increased. Therefore, the survey asked several questions about the cost of AEDs, including how respondents paid for any AEDs they currently have, how much money respondents spend on maintenance, and any barriers that would prohibit them from installing more AEDs.[39] A brief accounting of AEDs show their cost being between $1000 and $2000 per unit. This cost varies by model and optional add ons. The mounting of a semi-permanent AED unit would add additional cost. Relevant procurement policies and other institutional requirements may also impact cost.

---

[34] Id.
[35] Id.
[36] *Sudden Cardiac Awareness Month 2018*, EMS SAFETY SERVICES, INC. (Oct. 9, 2018), https://www.emssafetyservices.com/2018/10/09/cardiac-arrest-awareness-month/.
[37] William J. Brady, *Lay Responder Use of Automated External Defibrillators*, SUDDEN CARDIAC ARREST FOUNDATION, https://www.sca-aware.org/about-sudden-cardiac-arrest/be-prepared/aed-deployment (last visited Nov. 1, 2021).
[38] Id.
[39] For the full text of questions and responses about AED cost, see questions 6 and 9-12 in Appendix A.

While 64% of respondents either did not know or preferred not to disclose how they paid for their AEDs, only 8% of respondents reported utilizing grant money, and 28% knew that they used private money to install their AEDs. Furthermore, the vast majority (95%) of respondents were unaware of any funds, grants, or other programs that would help them install AEDs in their facilities. Many respondents also reported spending a significant amount of money maintaining their AEDs, with the most respondents (29%) spending $101-$500 each year, and 13% spending more than $1,000. However, 21% spent $0-$100 and 23% did not know how much money was spent. A smaller percentage of respondents (14%) reported spending $501-$1000. The most significant maintenance expense is changing pads and batteries.

Respondents who identified barriers overwhelmingly reported that the cost of installing and maintaining additional AED units is the main barrier to installing more of them. However, other barriers besides cost include concerns over liability if units do not work; lack of authority to place AEDs due to intergovernmental relations, administrative approval requirements, or landlord/tenant contracts; lack of personnel to oversee maintenance; keeping the AEDs in a secure location/away from inmates; various issues related to training, such as adding AED usage and training to emergency response manuals and proper training of staff; theft; space for storage and charging; and aesthetic concerns.

Appendix A: Standard Survey Summary from Alchemer Survey Tool

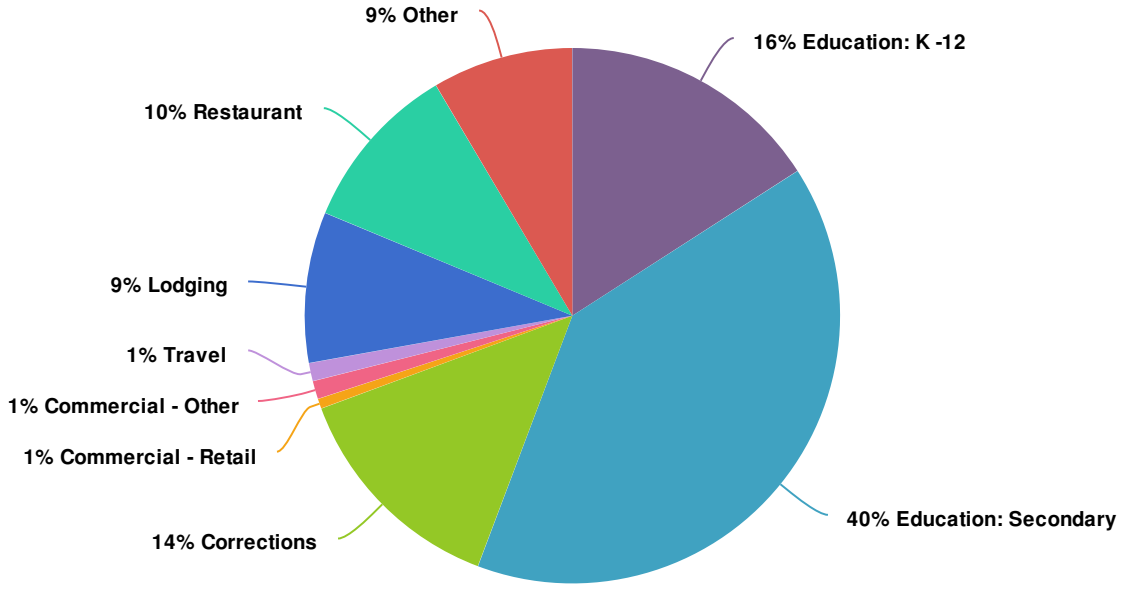
Report for AED Study Survey

Response Counts

Completion Rate:	**82.1%**		
	Complete		151
	Partial		33

Totals: 184

1. What industry do you represent?



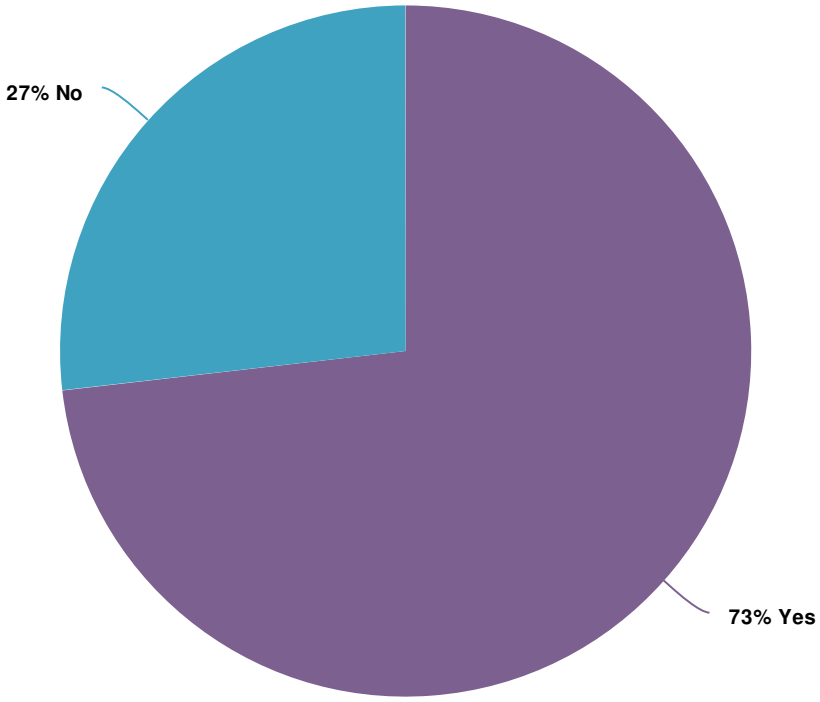
Value	Percent	Responses
Education: K -12	15.9%	28
Education: Secondary	39.8%	70
Corrections	13.6%	24
Commercial - Retail	0.6%	1
Commercial - Other	1.1%	2
Travel	1.1%	2
Lodging	9.1%	16
Restaurant	10.2%	18
Other	8.5%	15

Totals: 176

2. If "other" please describe.

Response
Public College
Accounting
Arena
Campground
Chamber of Commerce
College
Convention Center
Higher education
Non Profit Botanical Garden
Office
One Stop Location
Post secondary education
We house both a secondary education and a commercial business
amusement's
higher education
non-profit

3. Do you have AEDs at the facilities you represent/own?



Value	Percent	Responses
Yes	73.2%	131
No	26.8%	48

Totals: 179

4. How many total AEDs do you have across your facilities?

Response
2
3
1
6
4
5
7
12
15
24
10
11
14
16
9
1 in each building, 1 in gym, 1 for AT
100s
13
17
181
20
225
23

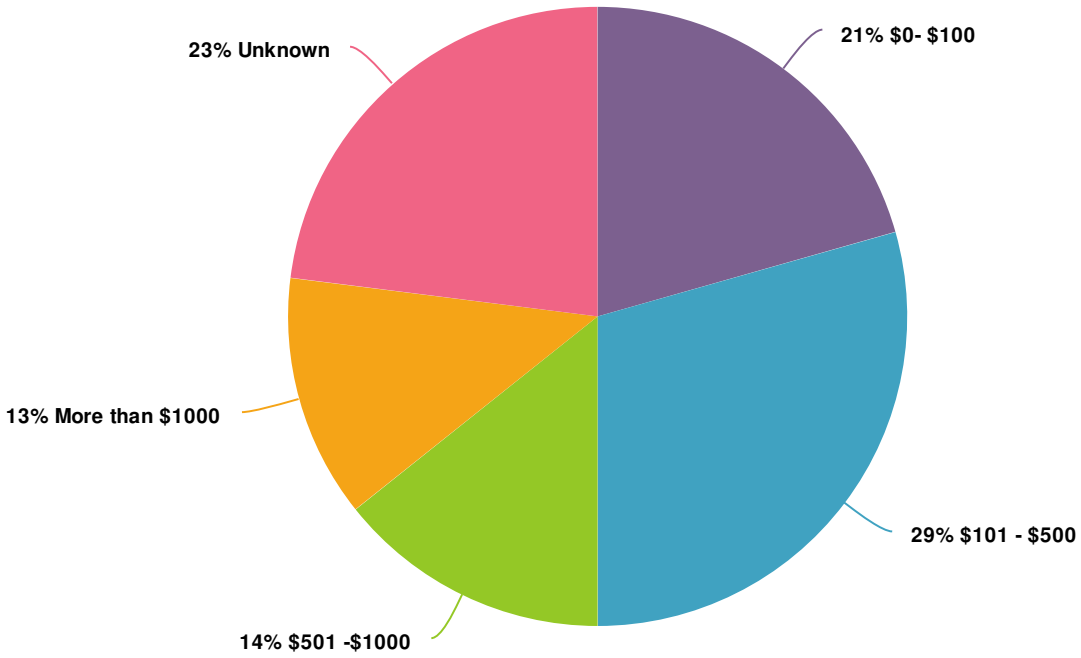
Response
27
33
38
4-5
40
45
67
680
683
72
8
Three
one
three that I know of

5. What is the approximate density of the AEDs across your facilities? Please average over all of your properties. If unknown, please write “unknown”

Response
unknown
Unknown
1
1 per building
3
4
.826
1 per 25000 sf
1 per building with exception of 2 larger academic facilities
1 per major use building
1 per occupied building
1,000 feet
1/HU and operational area
175 acres - 3 located near public gathering sites
2
2 AEDs for 2 main buildings
2 Per building
2 per 450 people
2 per building
2-8
21,000 sqft

Response
3 per building
4 AEDs per building; range is 2-9.
5
80
9.3% of our buildings have units and our 2 campus safety vehicles also have them.
A minimum of one AED in each building
At least one per building, some buildings that have multi-assembly events will have two AEDs located on separate floors. Our campus student centers have two AEDs, one on the first floor, one on the same floor as out fitness centers.
One in building, one designated for outside activities (athletics)
One per athletic field grouping
One per floor
Unkonwn
We generally have one per housing unit, each unit averages 200 people
We have enough to satisfy the 3-5min response time.
all sports and some academic
multiple per building
n/a
school nurse, gym, baseball/softball field, portable for football field
unknow

6. How much money, on average, do you spend each year maintaining your AEDs?



Value	Percent	Responses
$0- $100	20.6%	26
$101 - $500	29.4%	37
$501 -$1000	14.3%	18
More than $1000	12.7%	16
Unknown	23.0%	29

Totals: 126

7. What actions, such as changing pads and batteries or replacing broken or missing units, do you or your employees take to maintain your AEDs?

Count	Response
4	Employees monitor battery levels, battery and pad expiration dates, as well as perform periodic self-test of the units.
3	All of the above
1	AED's and supplies maintained by school health services. As the school nurse, I do the monthly checks and alert my supervisor to any needs, who then supplies them.
1	AEDs are maintained by an outside individual/party
1	All are monitored via internet connection - the provider lets us know if and when there is a problem
1	All listed along with weekly checks of function.
1	All of the above in addition to daily maintenance checks.
1	All of the above is done monthly.
1	Annual inspections. Batteries and Pads replaced when use, expired, or missing.
1	Batteries are checked and pads are replaced if the AED is used.
1	Change Pads & Batteries Training
1	Change pads & batteries as needed (expired).
1	Change pads and batteries when they expire
1	Change pads when used or expired and change batteries yearly.
1	Change pads, batteries, replace units as needed
1	Changing batteries when needed and pads when expired
1	Changing batteries, and pads when needed, and inspected yearly.
1	Changing batteries.
1	Changing pads replacing batteries Monthly checks
1	Changing pads & batteries when expired and as needed. Weekly check of machines power, function, safety, and supply inventory.

Count	Response
1	Changing pads and batteries
1	Changing pads and batteries and replacing broken units
1	Changing pads and replacing batteries. Just replaced and added new aeds this year for ATCs and around the school
1	Changing pads.
1	Check and replace batteries monthly
1	Check them monthly, change pad/battery back every 4 years, replace AEDs when they expire at the 8 year mark
1	Checked several times a year, replace pads, replace batteries, replace units as necessary
1	Checked weekly by nursing staff to ensure all parts are present and functional and to verify expiration date of pads and batteries. Batteries and pads are replaced as needed.
1	Checking pads and batteries every other month. Making sure they turn on and work correctly every other month
1	Checking the batteries each month and changing the pads when they are expired. Also keeping the supply kit up to date.
1	Contract for maintenance services through an outside vendor.
1	Contracted
1	Documented preventative maintenance system which is checked monthly by one employee and an alternate.
1	Each AED and its supplies are checked weekly for proper operations, damages, and expired supplies. All findings are reported, addressed and/ or replaced as appropriate.
1	Expiration and after each use. Order as needed
1	I'm the athletic trainer in my building. We have 4, 2 for athletics and one on each of our floors. I order new pads and batteries for all of our units. I am not certain of the other buildings We have 9 elementary schools, 4 middles schools, 3 high schools and then county buildings
1	Just routinely check to make sure we have a green light, replace pads and batteries on rotation as needed

Count	Response
1	Monthly check Order new pads, batteries when needed Stock CPR mask, guaze, scissors, with each AED
1	Monthly check and replace as needed
1	Monthly check of the unit.
1	Monthly check of units.
1	Monthly checks
1	Monthly checks and replacing batteries when applicable.
1	Monthly checks are conducted that requires a checklist to be completed. The checklist has 6 line items for pass or fail. Those line items include; Check the status indicator window is showing a green check mark indication the unit is ready to use, verify electrodes pads are within their expiration date, verify batteries are within their expiration date, verify electrodes are pre-connected to the input connector, verify that supplies are available for use (razor, mask, gloves), and verify the cabinet tamper alarm is activated and working. Inventory list identifies each AED unit with pad expiration date and battery install date, which is also labeled on each AED unit. Our program replaces all pads and batteries 5 years from installation, or sooner if pads have expired before then. Monthly checks are to also ensure AED units are not broken or missing and can be replaced if that is found to be the case.
1	Monthly checks on batter and pad life
1	Monthly checks, pad and battery replacements
1	Monthly inspection to ensure battery is good, equipment is in good condition.
1	Monthly inspections and replacing batteries and pads as needed.
1	Monthly inspections of all 67 AED's. Pads are changed every two years.
1	New FOOBAGS.
1	None, our host does as part of our lease agreement
1	Not allowing student to accidentally discharge them.
1	Only maintenance so far is battery replacement and pad replace due to expiration date on units
1	Our AED's are checked monthly to ensure that the battery is good and they are in working condition. The pads are replaced upon expiration and the batteries upon end of life or expiration.

Count	Response
1	Our Campus Safety Dept changes pads and batteries as needed. They check units once a month for proper operation.
1	Our School nurse checks our units regularly and makes sure they are working properly.
1	Our health services dept. is in charge of replacing batteries/pads and overall maintenance.
1	Pad and battery changes are the most frequent actions at my facility.
1	Periodic checks, change pads and batteries.
1	Primarily checking and replacing any items close to being out of date
1	Regular testing and maintenance
1	Replace batteries and pads
1	Replace batteries, Replace pads, Replace AED's
1	Replace batteries, changing pads, routine checks
1	Replace batteries, pads & conducts routine inspection test.
1	Replace once used. Yearly check on battery
1	Replacing batteries and pads if used.
1	Replacing expired pads, replacing expired batteries
1	Replacing the batteries is the only thing that has been done to the AEDs since the school received them.
1	School Nurse and Nurse coordinator, maintains all aspects of the AED
1	School nurse maintains
1	The cost identified is to change the pads and batteries annually because the consumables expire.
1	The machine is checked weekly to ensure that the dates are current for the batteries , pads etc.
1	The police department conducts monthly checks on AED's. Equipment is changed as needed, used or when expired.

Count	Response
1	Those actions are under a maintenance contract with Cintas
1	Visual inspection once a year, or after usage. Replace parts when necessary.
1	We check monthly for when pads,batteries expire.
1	We check units every six months
1	We do the above, but also determine if a unit needs to be upgraded or replaced.
1	We exchange batteries and other components as dates expire.
1	We have Philips Healthcare HeartStart OnSite (HS1) Automated External Defibrillators (AEDs) and the replacement of cartridge pads as well as the batteries are based upon the manufacturer's recommendations. The cartridge pads are replaced approximately every two years. Each AED has a cartridge pad in the unit and a spare cartridge pad in the case. The cartridge pads have an expiration date, so replacement pads are reordered based upon that date. The batteries are replaced based upon their installation date, because of the automatic self-test operation that occurs within each unit. The batteries typically last three years and replacement batteries are reordered based upon the installation date, plus three years. Replacement cartridge pads and batteries are purchased from State funds allocated for Administrative Services within the Facilities Department budget.
1	We have a company (Cintas) that comes in and maintains the AED when they maintain our first aid boxes.
1	We have a contract in place for this to be done for us annually.
1	We have a regular inspection and replacement cycle for batteries and pad replacements. Occasionally, we must replace a unit because of temperatures at outdoor locations.
1	We inspect AEDs weekly. We look for missing parts, damage, low battery, etc.
1	We perform semi-annual inspections of our AED's, change pads, batteries and replace broken or missing units as necessary.
1	We purchase parts online.
1	We replace pads and batteries as needed
1	We used to do it all; we now contact with a vendor to provide annual inspections and maintenance to include pads and batteries.
1	Weekly AED checks are done on the AEDs located in the medical department
1	Weekly Check

Count	Response
1	Weekly checks on function, batteries, and pads.
1	Weekly checks to include checking expiration dates on pads, battery and ensure it is functioning properly.
1	Weekly checks to verify expiration dates/damage.
1	Weekly inspections, repairs as needed, changing pads, batteries as needed
1	Yearly inventory, battery and pad changes.
1	all upkeep
1	annual training and updating of machine and accessories.
1	change batteries
1	change expired pads, change batteries, weekly checks on the units
1	change pads, batteries and maintain/ replace broken and missing parts
1	changing expired pads and batteries
1	changing expired pads, replacing batteries
1	changing pads and batteries
1	changing pads and batteries and yearly checks.
1	changing pads and batteries, testing and replacing broken units
1	changing pads and batteries. Replacing expired units.
1	check all pads, batteries, cords weekly
1	check batteries
1	check yearly replace as needed
1	checking batteries and expiration dates then report the info to maintance for replacement
1	just bought a brand new one
1	monthly checks of AED's and notify the building contact when pads/batteries need replacing. When the replacements arrive they are replaced by Fire Safety

Count	Response
1	monthly maintenance check that AED is operating properly, changing pads, changing batteries
1	perform weekly inspection of aed and exchange anything that needs corrected with the aed
1	report issues to be replaced
1	they are checked weekly, Batteries replaced after every use and every 3 years and pads replaced after use and per expiration dates
1	we do weekly checks for operation and expiration, if needed we order replacement
1	weekly checks replace batteries and pads as needed
1	weekly checks are performed by nurse

8. What rules, standards, or polices governed the placement of your AEDs?

Count	Response
4	When our AED's were placed, locations were determined through a regional collaboration that included healthcare, local government, our business community, as well as a public-private public access defibrillator program.
4	unknown
3	Unknown
2	N/A
2	None
2	Unknown
1	ACA standards and DOC standards
1	ADA Compliance
1	AED is placed in every building that houses inmates as well as work locations. Common employee areas have an AED.
1	AED placed near interior callbox locations and close proximity to entrances or security desks.
1	AED required in medical and at front entry.
1	AED's available in each building of the institution.
1	AHA
1	AHA standards, I believe.
1	Accessible on each floor of each campus building
1	All employees must take AED training. Units are checked each month by engineering department.
1	All sports/fitness locations. Try to locate the AED's in the same location in academic buildings (Elevator Lobby/under cameras near the exit)
1	All staff are AED trained. Yearly review with crisis team.
1	At least one per building.

Count	Response
1	Central location for easy access in an emergency
1	Checked weekly
1	Collaborative effort between school division, county government and the original AED vendor.
1	DOC policy
1	Departments request and pay for the AED. They are installed by the Facilities Dept. The Rescue Squad maintains the unit once installed.
1	Distance, time, accessibility
1	Easy access across all buildings.
1	Emergency euipment
1	Followed recommendations re mounting of units; no locality "standards or policies" were available related to placement
1	General rule was we placed them outside of our main offices in each school so it was easy for everyone to know the location as well as easy to notify staff of an emegency
1	Having AED's for faculty, staff, students, student-athletes, spectators, and visitors in various locations to meet 2-3 minute response time
1	Highly visible locations
1	Hilton Brand Standards
1	I am the athletic trainer at a high school. We have 4 for athletics. One stays with me, the others go with off campus teams or teams that are traveling. Our other 4 are located around the school.
1	I have created an emergency action plan for each sport venue we have. In each it discusses where the AEDs are and when to use them. I also have my EAP signs posted at each Venue. We also have AED signage all over to show where they are. We have boxes that hold the AEDs that have an alarm when they're opened to alert everyone. I also carry an AED with me at all times. Practice or competition
1	If it is determined AED may be needed, security officer brings it to area.
1	If used or out of date, replace
1	In development.

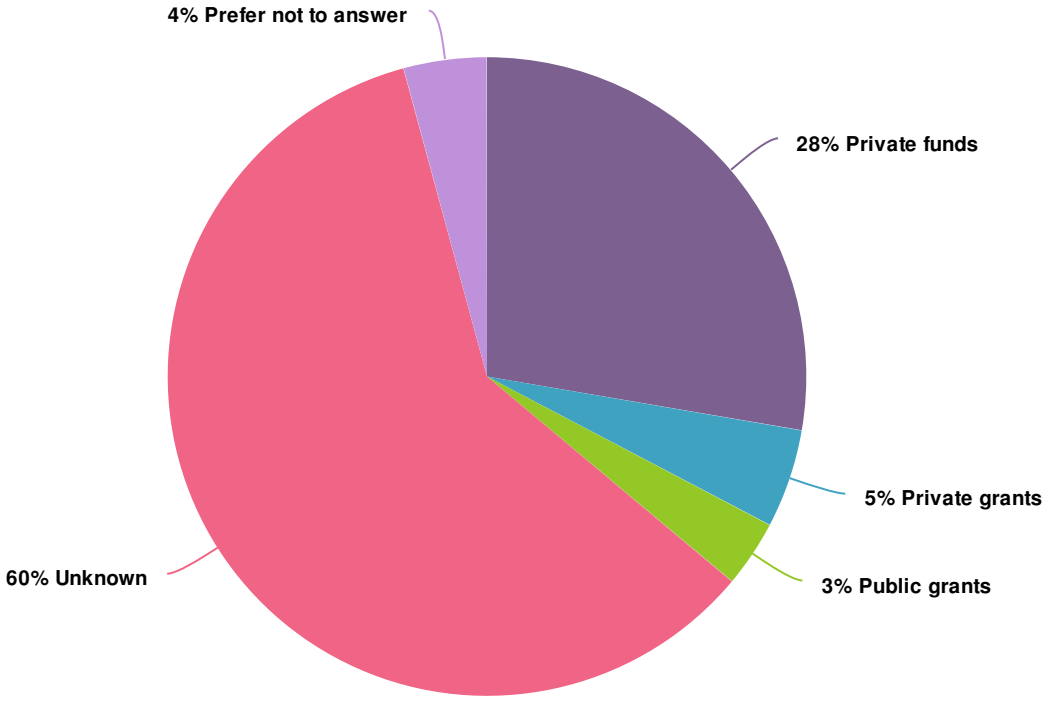
Count	Response
1	Industry standards, 90 sec retrieval I.e.
1	It is in a see thru cabinet at the front gate, easily accessible by all staff.
1	Largest gathering areas.
1	Lease agreement leaves this up to the host.
1	Less than 2 min. from any location. High traffic areas, with medical provider.
1	Local school board and state agencies
1	Located near public gathering sites, especially since we have multiple wedding sites that are being used.
1	Medical and Operational policy.
1	Medical guidelines
1	NATA we wanted them in each school and our county did it by numbers in each school and then athletics got their own to be able to take off site for game
1	Need within the building given the size
1	None particularly. Placed at least one in each building where they would be easily accessible.
1	None. We have them in several buildings, Gym, and police vehicles
1	One AED is placed on a wall outside the main office complex and the other on a wall outside the gym. All professional staff and the school nurse is trained in operating the AEDs.
1	One stays in school Three athletic aeds placed at field houses outside
1	One with the athletic trainer and one located in the building near athletic facilities and accessible to all.
1	Only rule is one per floor on out main campus in locations open to anyone, sub campus same and also located where employees only have access
1	Only used by professional staff
1	Operating Procedure 720.7
1	Operating procedure 720.7 defines emergency medical equipment and care

Count	Response
1	Our AED's are placed in easily accessible areas and the locations of each are published each year in our continuity plan.
1	Our nurses help implement the placement within the school. The NATA position statement of prevention of sudden deaths allow ATC to always carry AED with us or have it be within 3 minutes of us, to allow for immediate access to prevent any delay of care
1	Ownership initiative
1	Part of a comprehensive Emergency Management Plan.
1	Place in the main office and the gym
1	Placed in most academic buildings and staged during athletic events. University Police patrol vehicles have an AED in the trunk.
1	Policy states that I will have a minimum of 1 AED in the same building occupied by inmates.
1	Recommendation of contractor.
1	Required trained staff training
1	Sports Medicine Policies and Procedures Manual
1	Standard Treatment Guidelines
1	Strategic placing based on risk and possible need.
1	Strive to have an EAD 3 mins away from anywhere on campus
1	The AED is in a case in the Middle area of the school
1	The AED's are placed in areas within close proximity to our contract security offices (although not designated as first responders, TCC's security officers have cardiopulmonary resuscitation (CPR), first aid, and AED training), and in the Student Centers, near the fitness areas. There are no federal and/or state safety and health regulations that govern the placement of AED units. TCC's determination for the placement of the AEDs was based upon activities within the buildings.
1	The institution had them placed in the areas of highest foot traffic.
1	There are manufacturer's recommendations for monthly inspections, but our facility has a guideline of weekly inspection by a nurse.
1	These AED's were placed prior to the current team being here so this is unknown.

Count	Response
1	They are checked weekly. Kept in all buildings, medical, warehouse, and front search
1	They are with student health, campus security, and in the student center.
1	They have to be in a highly visible location and persons using them must be trained.
1	Time and distance required to access from any given point/location in the building when needed
1	Unknown; AEDs have been in place for 15+ years.
1	VADOC policy
1	VDOE
1	We are a Medical College and have many physicians trained to use AED's
1	We feel it is best practice to have at least one AED in each building. Some larger buildings have one AED per floor.
1	We have AED guideline
1	We have enough in the building so the response time is within 3-5 minutes as suggested by the NATA. We also have one that is on the stadium field with the AT during all contests.
1	We have recently upgraded our AED to a newer model. I'm not sure what the rules are for replacing them?
1	We have units placed in two vehicles so when Campus Safety responses to an emergency they have it with them. The other units are placed strategically in higher risk buildings such as our Health Clinic, Fitness and Athletic facility, one that goes to our athletic competitions, Riding Center etc.
1	We place these in proximity to most classrooms as well as athletic fields.
1	We placed onse on each floor with response time to be less then 2 minutes to activate.
1	We used density of people on our campus and the likelihood of choking and other secondary causes of cardiac arrest to inform our placement. Our Emergency Manager is an EMT.
1	Weekly checks, 720.7 policy
1	Worked with American Heart Association to help determine placement.
1	accessibility and need

Count	Response
1	must be trained to use
1	none.
1	refer to Risk Management with Prince William County Public Schools
1	unsure
1	we carry the AED to all medical emergency's
1	weekly checks.

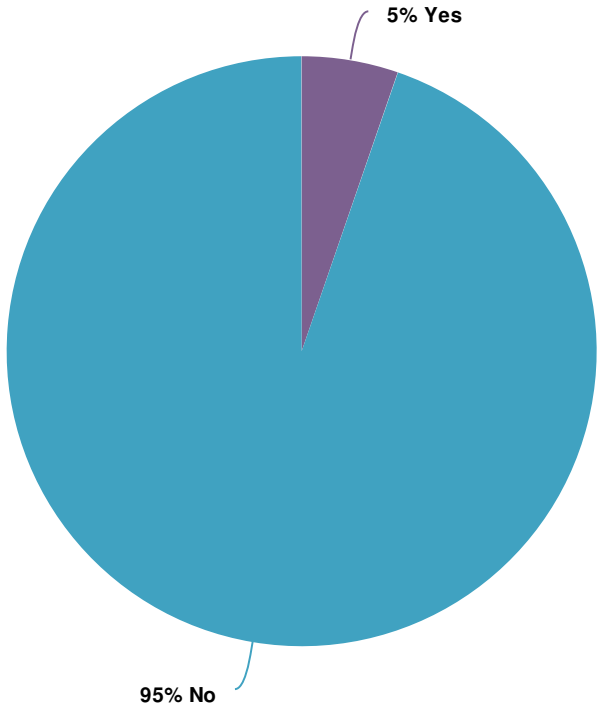
9. If known and you are comfortable providing this information, what funding source(s) were utilized to pay for and install your AEDs?



Value	Percent	Responses
Private funds	27.7%	33
Private grants	5.0%	6
Public grants	3.4%	4
Unknown	59.7%	71
Prefer not to answer	4.2%	5

Totals: 119

10. Are you aware of any funds, grants, or other programs that would help you pay for or install AEDs?



Value	Percent	Responses
Yes	5.3%	8
No	94.7%	142

Totals: 150

11. Please elaborate is "Yes".

Response
AEDGrant.com
Byrne grants and such
I see that some are available but it is usually just a small amount taken off. Nothing free.
Many hospitals have grants
There are various charitable organizations that provide grants or AEDs to schools.
We are working with the system's office to purchase additional AEDs
Williamsburg Health Foundation - for the Historic Triangle of Virignia

12. What barriers besides cost would prohibit you from installing more AEDs in your facility?

Count	Response
29	None
19	none
5	unknown
2	Funding
2	Just cost
2	N/A
2	None
2	Training
2	liability
1	None
1	.
1	Aesthetics
1	All areas are covered.
1	Approval by PWCPS administrators
1	As mentioned purchase expense as well as maintenance expense and labor resources impact our ability to purchase more units.
1	Being able to have a few practice units to ensure my staff is properly trained.
1	Cost
1	Cost and liability
1	Cost of units and replacement equipment
1	Cost only and maintenance cost
1	Costs
1	Costs for replacements upon expiration.

Count	Response
1	Decisions are made by the county and not the individual schools
1	Facility approval main barrier is cost.
1	Fear of liability
1	Financial.
1	Funding from our school board.
1	Have no other barriers besides cost
1	Having stafff who are able to use the equipment correctly and calmly in an emergency. Also storage and charging of the unit, which would require dedicated spaces and power supply.
1	Having to get approval from admin.
1	I believe that our facilities are optimally covered; however, if additional grant funds were available, we could equipment each of our police vehicles with an AED.
1	I don't believe we need more
1	Inmate population and secure location
1	Just cost.
1	Lawsuits. We had them but took out due to to many companies being sued over faulty systems, miss use, and other reasons.
1	Liability and on-going checks/verifications on the units and actual knowledge if one was going to use the unit in a real world emergency.
1	N/a
1	NA
1	No additional needed.
1	No barriers other than having the financial resources to do it; need about 4 more for our facility
1	No barriers, we have added several AED's and replaced several as well with our own funds.
1	No other barriers

Count	Response
1	None known
1	None, as this is a requirement.
1	None, the school has had AEDs for five years.
1	None.
1	None. Have full support from Superintendent.
1	None. If cost was covered to purchase additional AEDs in our facilities, we would do so. Also on question 8, AED units are purchased through public funds, which was not an option in the drop down selection.
1	None. We maintain our inventory using allotted funds.
1	Not really a need based on size of operation
1	Nothing
1	Nothing else. But like previously mentioned, with the help of public grants, we were able to add more in the school to helo
1	On a military base
1	Only cost and the actual need for more.
1	Our lease may require landlord to do this
1	Personnel to oversee maintenance
1	Safety
1	Security of the devices
1	Space
1	The individual departments purchase the equipment.
1	There are no barriers that I am aware of that would prevent installing more AEDs

Count	Response
1	Tidewater Community College's AED Program is maintained by the Safety Program Coordinator; and having more AEDs would place an even greater responsibility for that one person to maintain. Unless an employee is 'designated' as a first responder, and is fully trained to operate an AED during a life threatening medical emergency, and their position description includes that responsibility, there is the possibility that the AED, although available for use, would NOT be used. Having more AEDs does not guarantee people/employees will use one during a sudden cardiac arrest (SCA) medical emergency.
1	Time for training
1	Upkeep and maintenance to keep units working and up to date.
1	We are currently in the process of adding more AED's Post-wide.
1	We are good with four
1	We would need the necessary training to properly operate the device
1	We would question the need for more.
1	actual need
1	adding it to the already established EAP/ PP manual
1	approval from HR
1	cost only
1	just cost
1	n/a
1	none
1	only cost
1	permits
1	suitability
1	suitable locations
1	the numbers of clients in our population
1	theft

13. In your opinion, is there a need for a larger, smaller, or similar number of AEDs in your industry? If there is not a need for AEDs, please note this as well.

Count	Response
6	Larger
6	Similar
4	larger
4	similar
3	No
2	Similar
2	no need
2	unknown
2	yes
1	A few additional AEDs could be placed in other locations
1	A larger number of AED's are needed.
1	A larger number so there is more coverage
1	Additional AED's are always needed
1	Additional AEDs so there would be one in each building would be helpful.
1	An institution of our size should have at least one.
1	Current number is sufficient
1	Definitely need them in our facility - need about 4 more
1	Don't know
1	Each school should have the appropriate number needed
1	Every location should have them - it makes sense given their importance and ease of use.
1	Have not seen the need

Count	Response
1	I am sure across the VADOC there is an increased need with growing elderly population and acuity.
1	I believe all hotels should have at least one.
1	I believe our approach of one per floor per building is adequate
1	I don't believe that there is a need.
1	I feel one per 300 rooms in a hotel is sufficient
1	I think all buildings and businesses should have an AED.
1	I think due to the number of floors in each building on our campus, one unit per building would provide the coverage needed, currently we have one per floor
1	I think that each dorm should have a AED, so if an emergency arise it is there
1	I think we need at least two more the way our school is designed but our AED style is just fine we all have Phillips
1	I would like to see an AED in every single building and dorm area.
1	Ideally all residence and academic/administration buildings would have a AED unit.
1	In massage therapy, there is a growing client population of elderly clients. Also, clients with other health issues as well. I believe the industry as a whole would benefit from AED's. Knowing that time is always of the essence we would love to have an AED here.
1	In my opinion, I believe there should be more AED's available.
1	In my opinion, I would advocate for additional AEDs in all public buildings and outdoor recreation facilities.
1	In my opinion, having one AED per building, and two in buildings having events or group gatherings is more than adequate. In the nineteen years TCC has had an AED program, there has not been a single use of an AED during a sudden cardiac arrest event. We have AED's available as a best practice for our campuses and our safety and health program for students, faculty, staff and visitors.
1	In my opinion, one AED on each floor is sufficient.
1	In our school specifically, there's a need for an additional AED on the second floor - but overall, our county provides the necessary number of AEDs
1	It varies from school district

Count	Response
1	It would be beneficial to have updated technology when available.
1	Larger
1	Larger 1 AED minimal in each building.
1	Larger need
1	Larger need for accessibility in times of need.
1	Larger need, due to cosmetology service to general public and post secondary vocational students.
1	Larger number
1	Larger number of units.
1	Larger number.
1	Larger. Every facility in my industry should have at a minimum 1 AED located in it.
1	Luckily we haven't had to use ours yet, and it is extremely unlikely that we would need more than 2 at one time. We believe two is the perfect number.
1	More AEDs.
1	More would be better in a perfect world, one per building
1	Most hotels have one located near the front desk. Generally I see that as sufficient. Larger hotels with meeting space should also have one near the meeting space.
1	My high school of 2100 students has the most AEDs in the county. The majority of the schools have 2, 1 by the main office and 1 with the AT. The need for more units per school is definitely needed.
1	N/A
1	No additional ones needed at this time.
1	No idea
1	No idea.
1	No longer a need as we have added more

Count	Response
1	No. The emergency response to a medical event is fast—within 3 minutes of a 911 call, It would take al test that long to get the equiopment out and in use by someone who is trained to use it correctly.
1	No. I believe we have an adequate amount.
1	Not a need
1	Not a need at this time.
1	One AED per building would be ideal. That would mean an increase of 4 more
1	Penal institutions have a variety of configurations. Our facility with roughly 200 per housing unit means it makes sense (in my opinion) to have one AED available. On the other hand a "high rise" jail may want to have an AED on every floor. I do not know if the "industry" has enough AEDs overall.
1	Probably 5 or more in each school. You never know when you'll need them and it's better to have more and need them, than less and not have enough
1	Same
1	Similar number of AEDs
1	Smaller
1	The campus could always use more AED's throughout
1	The same or larger
1	There is a need for more aeds
1	There is a request for larger number--for example, our "admissions office" has requested a unit for their building rather than rely on access to the mobile unit our campus safety staff have.
1	There is no need for AEDs
1	There is not a need.
1	There should be an AED in every hotel and restaurant nationwide.
1	This school could use more.
1	Two AEDs adequately serve the school that I am the principal at. I feel some of the larger school could use more than two.

Count	Response
1	Unknown
1	Unsure
1	We are happy with the number of AEDs we have for our campuses.
1	We could always use more AEDS in the facility
1	We could possibly use one or two more in our bigger facilities
1	We could use more
1	We have 20 classrooms, we could use a couple of more in the admin building.
1	We have a sufficient amount
1	We have an adequate amount of AEDs
1	We have enough AED's
1	We have good coverage with their location now
1	We have had our AEDS for over ten years an4 have never had a medical issue that required their use. We are a convention center that hosts approximately 400,000 people a year.
1	We have installed additional AEDs as needed and at this time, feel our locations are covered.
1	We have not had any tenant press for these units in our office buildings recently.
1	We have the adequate amount at this time
1	We need a larger number
1	We need more AEDs
1	We would like to have them at our outdoor athletic fields
1	Would like to have the potential for more for bus travels for athletics.
1	Yes
1	Yes, I feel there is a need for a slightly larger number of AED's due to the size of our school campus.

Count	Response
1	Yes. There is a larger need because our campuses serve more than just our immediate community. We host many public events on our campus.
1	larger amount
1	larger need as we have no AEDs located at our outdoor facilities (athletic fields). 5 of our 6 AEDs are mounted inside the main school building and 1 is portable and gets taken to outdoor events.
1	larger number
1	larger, by the fields
1	maybe 1 more
1	na
1	no additional need for more aeds at this time
1	no opinion
1	none
1	same
1	similar need
1	smaller
1	we need at least 2 more AED's in building: 1 on second floor of building, 1 in West end of building by ROTC, Tech Ed hallway
1	we service a very large school system, so I would assume a larger number of AED's throughout the county would be warranted.
1	we would need more
1	yes more needed close to all spaces
1	yes, anywhere you have the public and staff, they are good to have

14. For your industry, what do you think would be the most useful density measurement for AEDs? For example, AED density can be measured based on occupancy limits, capacity limits, square footage, number of floors in a building, or number of rooms in a building, and may differ between indoor and outdoor spaces. Why would this measurement be helpful for your industry?

Count	Response
3	unknown
2	Unknown
1	1 AED per 100 student athletes or max number of spectators per facility.
1	1 for each building that has rentable rooms. Nothing for a parking structure.
1	1 for each floor
1	1 for each on campus athletic facility, as well as any team that travels. Current believe we have enough in the high school building.
1	AED density should be measured based on number of occupancy and number of rooms in a building
1	AED should be within 2 or 3 mins of any location in the school. Near main offices & gyms On Fields On EVERY floor
1	Access distance in likely usage areas.
1	All needs to be taken into consideration. One could have a large warehouse, sf wise, with only a couple of occupants so sf would not be a useful density measure.
1	Amount of people that attend events or festivals that we hold. How many AEDs should be available per events?
1	An AED per building and on our farm that has the majority of our inmates working on a daily basis
1	An available AED based on time no further away than 1 1/2 minutes would be the most useful measurement for our facility.
1	Any of the above would work. I think it would help to have an industry standard based on any or all of these measurements.
1	Based on a combo of population and per building. If there were a standard like fire extinguishers it would help .

Count	Response
1	Because there are many variables, I do not have an opinion, our college is one per floor which to me is to many units for the square footage and number of people on campus of which are younger and have fewer health issues
1	Building usage and or function (i.e. athletic facility, dining hall , etc.)
1	By floor (or space for outdoors) And one per 5,000 occupancy for large venues
1	Combination of number of hotel rooms and square footage of meeting space. For example 1 per 150 rooms and 1 per 10,000 square feet of meeting space.
1	Density of incidences where an AED would have been useful seems to be the most logical.
1	Depending on the location of the business, if there is not an AED in close proximity it could be beneficial to have one on site
1	Distance and time for foot travel should be the measurement.
1	Don't know
1	Due to high volume in our school, with overcrowding as an issue, it is helpful for these numbers to convey the useful help of adding AEDs to our overcrowding trailers and any more additional space needed.
1	Floors + sq. footage + other buildings on campus..
1	Floors and rooms in buildings
1	Floors in a building.
1	For hotels, number of rooms should determine number of AEDs.
1	For our industry, the most useful density measurement for AEDs is based on square footage.
1	Helpful information as this would increase the deployment of AEDs on campus.
1	I believe 3 would be the best density for our area due to the size of our campus and locations for athletics. We would like to have an AED within less than 5 minutes of all student, faculty, and staff. It would help us get our administration on board for distributing the funds.
1	I believe it would be a wonderful asset to have at our facility. Not just for our business, but I don't believe some of the surrounding businesses have them either. Our hours of operations are typically 9am-9pm M-F and we are open on Saturdays and Sundays as well. We our very fortunate to also have staff that are First Aid and CPR certified, including an instructor of First Aid and CPR.

Count	Response
1	I believe that each facility, outdoor area, etc. should use multiple variables when determining their AED needs; however, one of the most important is the assigned use group, occupancy loads, facility uses (i.e. classrooms, productions, athletic events, etc.), as well as coordination with local emergency services to determine average response time, response capabilities, etc.
1	I believe there should be a policy stating, for example, An AED should be located on each floor of a building and accessible within 1 min.
1	I do not know
1	I don't know
1	I feel square footage and the number of floors in a school building should be the determining factor in the number of AEDs needed.
1	I operate hotels and I have 1 per hotel. Our ability to use elevators to respond to an emergency make response to an emergency relatively quick in my opinion.
1	I see it being very arbitrary. They are only useful if someone is available to use it. With campus security, athletic training, and student health having access to them, I believe the coverage is already ample.
1	I think AEDs per building is the best measurement
1	I think a density of one unit per 50 people.
1	I think i depends upon the floor space. Can you quickly reach one located in a central area, or is it a hike? If the latter, than two or more units make more sense.
1	I think it's at least 1 per building, and if multiple floors one per floor as well. Quicker and easier access the better chance of saving someone
1	I think one has to consider both the population and configuration of a jail/prison. Some facilities are "sprawling" and even though the population may be low, having an AED in each housing unit is likely a wise choice. I think a formula that took into account proximity and population may work best.
1	I would do it based on number of floors and rooms per floor. You could not do just one or the other, mostly because every hotel has a different number of rooms per floor. You also wouldn't want to take one up or down more than 5 flights.
1	I would like to see an AED in every building and dorm area.
1	I would suggest 3-4 per floor in common areas
1	Inmates are in different classrooms.

Count	Response
1	It may help for Security to have access to the AED in the dormitories. They are often onsite and are the reporting staff when an emergency occurs.
1	It would not
1	Measurements might be helpful, but we would hate to see mandates to cover certain density measures. We cannot invest every year in new units. Upkeep is a factor as well as each unit requires $250-$800 of maintenance every 4 years.
1	Minimum of 1 AED on every floor
1	Not helpful for us. I am at a school
1	Not sure
1	Number of AEDs compared to the number of patients, staff, and visitors present
1	Number of floors and occupancy
1	Number of floors. You should not have to run up or down stairs looking for an AED.
1	Number of inmates per AED.
1	Number of rooms
1	Number of rooms in a facility, and how quickly those areas (inside and out) could be accessed through Security. Data collected would include the timeliness of reaching an individual from the first notification, route taken, barrier identification, trained staff availability and patient outcome, to name a few necessary for proper review of quality of care and necessity of equipment.
1	Number of rooms or inmates, some areas are more populated than others.
1	Number of rooms would be the best measure for the number of units.
1	Occupancy Amount of use of the facility Population density Population age and health Intended use of the building (gym, etc)
1	Occupancy Limits
1	Occupancy limits
1	Occupancy limits - we have a large campus but small number of students
1	Occupancy limits/capacity limits would be useful as we have facilities of various sizes

Count	Response
1	One in each building for quicker retrieval when needed.
1	One on each floor
1	One per building would be ideal, so if an emergency happens the AED would be available faster.
1	One per floor works best of our density
1	Placement is important so that everyone practicing has close access
1	Population density
1	Prefer to have one on each floor.
1	Probably it would be useful.
1	Several measurements should be taken into consideration. Occupancy limits can play a role, not just for classroom space, but also with event space (i.e. auditoriums). Square footage and number of floors in a building may also play a role for quick access to an AED. The farther you have to go to retrieve an AED, the higher risk of the patient not making it. This isn't necessarily just measurements for higher education, but for any facility.
1	Square Footage
1	Square footage
1	Square footage and capacity. Our AEDs are primarily located in schools and their locations are based on relative time required to travel from a given point in the building to the nearest AED and back.
1	Square footage and number of athletic venues
1	Square footage and number of floors, also amenity areas in the property (fitness)
1	Square footage and occupancy limit
1	Square footage and usage of building
1	Square footage, floors, and rooms. Helpful to determine need of AEDs.
1	Square footage. This would help in making sure the building is covered for access to AED
1	Square footage/ size. Number of floors. You don't need them often, but when you do it needs to be handy—nearby

Count	Response
1	The number of AED's provided in any industry should be based on the statistics maintained by the American Heart Association for the number of sudden cardiac arrest (SCA) events that occur within a specific North American Industry Classification System (NAICS) code. Building occupancy rates, number of floors, rooms etc., in my opinion, would result in an overabundance of AED's, and therefore, a higher financial burden on a state institution of higher education where funding is already limited based upon student enrollment which has declined since 2012.
1	The number of floors and square footage all contribute to the response time. Distance from outdoor venues is also a factor.
1	The number of floors in a building is a useful measurement for AEDs.
1	This measurement should be based on the number of inmates/staff and the physical set up of the facility. This measurement would help standardize our AED processes across the VADOC.
1	Time to retrieve AED from each location, less than 2 min.
1	To make sure each housing area has an AED on site
1	Unknown
1	Use of a measurement formula would be extremely useful for our secondary education facilities
1	We have several hallways that act as wings for subject areas. It would help to have one on each major hallway.
1	Would need guidance from medical community in regard to the timing of using the device on someone to figure out from every location in the facility where one was needed to meet that timeline.
1	Would suggest having at least one per building
1	Yes, I think it would be beneficial to determine a number of AED's needed based on square footage, number of floors and the number/ratio of AED's between our indoor and outdoor activities.
1	Yes, to set a standard of number and locations
1	capacity
1	capacity limits, square footage
1	density of the number of athletes to number of AEDs would be very telling
1	distance and not density

Count	Response
1	distance/time to go get AED and return to area where it's needed.
1	na
1	no clue
1	no opinion
1	not sure
1	number of floors in a building
1	number of floors, occupancy limits, and square footage
1	number of people in the building
1	number of rooms in a building
1	occupancy
1	occupancy limits
1	occupancy limits per floor
1	occupancy type and floors
1	occupancy. should be placed where highest traffic is
1	occupancy/capacity limits
1	should be occupancy?
1	sq ft and indoor and outdoor venues/ accessibility
1	square footage, due to the amount of time it takes to get to one area to another
1	square footage... need to have enough of them to be in places that are easy to get to. Not enough in a large space could lead to not being to get proper help on time
1	two per floor
1	unsure
1	would allow us to provide administrators the information to fight for more AED's

Appendix B: Item 116 of HB 30 (2020)

2020 Session

Budget Bill - HB30 (Chapter 1289)

Bill Order » Office of Commerce and Trade » Item 116

Department of Housing and Community Development

Item 116	First Year - FY2021	Second Year - FY2022
Regulation of Structure Safety (56200)	**$2,981,943**	**$2,981,943**
State Building Code Administration (56202)	$2,981,943	$2,981,943
Fund Sources:		
General	$517,160	$517,160
Special	$2,164,783	$2,164,783
Dedicated Special Revenue	$300,000	$300,000

Authority: Title 15.2, Chapter 9; Title 27, Chapters 1, 6, and 9; Title 36, Chapters 4, 4.1, 4.2, 6, and 8; Title 58.1, Chapter 36, Article 5; and Title 63.2, Chapter 17, Code of Virginia.

A. The Department of Housing and Community Development shall establish a workgroup to study the ideal Automated External Defibrillator (AED) density in commercial and residential buildings. The Department shall report its findings to the Chairs of the House Appropriations Committee and the Senate Finance and Appropriations Committee on or before November 1, 2021.

Appendix C: Chapter 978 of the 2003 Virginia Acts of Assembly

CHAPTER 978

An Act to amend and reenact § 8.01-225 of the Code of Virginia, and to repeal § 32.1-111.14:1 of the Code of Virginia, relating to eliminating the requirement for registration of automated external defibrillators; public-access defibrillation.

[H 1860]

Approved April 2, 2003

Be it enacted by the General Assembly of Virginia:

1. That § 8.01-225 of the Code of Virginia is amended and reenacted as follows:

§ 8.01-225. Persons rendering emergency care, obstetrical services exempt from liability.

A. Any person who:

1. In good faith, renders emergency care or assistance, without compensation, to any ill or injured person at the scene of an accident, fire, or any life-threatening emergency, or en route therefrom to any hospital, medical clinic or doctor's office, shall not be liable for any civil damages for acts or omissions resulting from the rendering of such care or assistance.

2. In the absence of gross negligence, renders emergency obstetrical care or assistance to a female in active labor who has not previously been cared for in connection with the pregnancy by such person or by another professionally associated with such person and whose medical records are not reasonably available to such person shall not be liable for any civil damages for acts or omissions resulting from the rendering of such emergency care or assistance. The immunity herein granted shall apply only to the emergency medical care provided.

3. In good faith and without compensation, administers epinephrine to an individual for whom an insect sting treatment kit has been prescribed shall not be liable for any civil damages for ordinary negligence in acts or omissions resulting from the rendering of such treatment if he has reason to believe that the individual receiving the injection is suffering or is about to suffer a life-threatening anaphylactic reaction.

4. Provides assistance upon request of any police agency, fire department, rescue or emergency squad, or any governmental agency in the event of an accident or other emergency involving the use, handling, transportation, transmission or storage of liquefied petroleum gas, liquefied natural gas, hazardous material or hazardous waste as defined in § 18.2-278.1 or regulations of the Virginia Waste Management Board shall not be liable for any civil damages resulting from any act of commission or omission on his part in the course of his rendering such assistance in good faith.

5. Is an emergency medical care attendant or technician possessing a valid certificate issued by authority of the State Board of Health who in good faith renders emergency care or assistance whether in person or by telephone or other means of communication, without compensation, to any injured or ill person, whether at the scene of an accident, fire or any other place, or while transporting such injured or ill person to, from or between any hospital, medical facility, medical clinic, doctor's office or other similar or related medical facility, shall not be liable for any civil damages for acts or omissions resulting from the rendering of such emergency care, treatment or assistance, including but in no way limited to acts or omissions which involve violations of State Department of Health regulations or any other state regulations in the rendering of such emergency care or assistance.

6. ~~Has attended and successfully completed a course in cardiopulmonary resuscitation which has been approved by the State Board of Health Who,~~ In good faith and without compensation, renders or administers emergency cardiopulmonary resuscitation, cardiac defibrillation, including, but not limited to, the use of an automated external defibrillator, or other emergency life-sustaining or resuscitative treatments or procedures which have been approved by the State Board of Health to any sick or injured person, whether at the scene of a fire, an accident or any other place, or while transporting such person to or from any hospital, clinic, doctor's office or other medical facility, shall be deemed qualified to administer such emergency treatments and procedures and shall not be liable for acts or omissions resulting from the rendering of such emergency resuscitative treatments or procedures.

7. ~~In compliance with § 32.1-111.14:1 registers an automated external defibrillator for use at the scene of an emergency,~~ Operates ~~a registered~~ *an* automated external defibrillator at the scene of an emergency, trains individuals to be operators of ~~registered~~ automated external defibrillators, or orders automated external defibrillators ~~which are subsequently registered~~, shall be immune from civil liability for any personal injury that results from any act or omission in the use of ~~a registered~~ *an* automated external defibrillator in an emergency where the person performing the defibrillation acts as an ordinary, reasonably prudent person would have acted under the same or similar circumstances, unless such personal injury results from gross negligence or willful or wanton misconduct of the person rendering such emergency care.

8. Is a volunteer in good standing and certified to render emergency care by the National Ski Patrol System, Inc., who, in good faith and without compensation, renders emergency care or assistance to any injured or ill person, whether at the scene of a ski resort rescue, outdoor emergency rescue or any other place or while transporting such injured or ill person to a place accessible for transfer to any available emergency medical system unit, or any resort owner voluntarily providing a ski patroller employed by him to engage in rescue or recovery work at a resort not owned or operated by him, shall not be liable for any civil damages for acts or omissions resulting from the rendering of such emergency care, treatment or assistance, including but not limited to acts or omissions which involve violations of any state regulation or any standard of the National Ski Patrol System, Inc., in the rendering of such emergency care or assistance, unless such act or omission was the result of gross negligence or willful misconduct.

9. Is an employee of a school board, authorized by a prescriber and trained in the administration of insulin and glucagon, who, upon the written request of the parents as defined in § 22.1-1, assists with the administration of insulin or administers glucagon to a student diagnosed as having diabetes who requires insulin injections during the school day or for whom glucagon has been prescribed for the emergency treatment of hypoglycemia shall not be liable for any civil damages for ordinary negligence in acts or omissions resulting from the rendering of such treatment if the insulin is administered according to the child's medication schedule or such employee has reason to believe that the individual receiving the glucagon is suffering or is about to suffer life-threatening hypoglycemia. Whenever any employee of a school board is covered by the immunity granted herein, the school board employing him shall not be liable for any civil damages for ordinary negligence in acts or omissions resulting from the rendering of such insulin or glucagon treatment.

B. Any licensed physician serving without compensation as the operational medical director for a licensed emergency medical services agency in this Commonwealth shall not be liable for any civil damages for any act or omission resulting from the rendering of emergency medical services in good faith by the personnel of such licensed agency unless such act or omission was the result of such physician's gross negligence or willful misconduct.

Any person serving without compensation as a dispatcher for any licensed public or nonprofit emergency services agency in this Commonwealth shall not be liable for any civil damages for any act or omission resulting from the rendering of emergency services in good faith by the personnel of such licensed agency unless such act or omission was the result of such dispatcher's gross negligence or willful misconduct.

Any individual, certified by the State Office of Emergency Medical Services as an emergency medical services instructor and pursuant to a written agreement with such office, who, in good faith and in the performance of his duties, provides instruction to persons for certification or recertification as a certified basic life support or advanced life support emergency medical services technician shall not be liable for any civil damages for acts or omissions on his part directly relating to his activities on behalf of such office unless such act or omission was the result of such emergency medical services instructor's gross negligence or willful misconduct.

Any licensed physician serving without compensation as a medical advisor to an E-911 system in this Commonwealth shall not be liable for any civil damages for any act or omission resulting from rendering medical advice in good faith to establish protocols to be used by the personnel of the E-911 service, as defined in § 58.1-3813.1, when answering emergency calls unless such act or omission was the result of such physician's gross negligence or willful misconduct.

Any licensed physician who directs the provision of emergency medical services, as authorized by the State Board of Health, through a communications device shall not be liable for any civil damages for any act or omission resulting from the rendering of such emergency medical services unless such act or omission was the result of such physician's gross negligence or willful misconduct.

Any licensed physician serving without compensation as a supervisor of ~~a registered~~ *an* automated external defibrillator in this Commonwealth shall not be liable for any civil damages for any act or omission resulting from rendering medical advice in good faith to the ~~registrant~~ *owner* of the automated external defibrillator relating to personnel training, local emergency medical services coordination, protocol approval, automated external defibrillator deployment strategies, and equipment maintenance plans and records unless such act or omission was the result of such physician's gross negligence or willful misconduct.

C. Any provider of telecommunication service, as defined in § 58.1-3812, including mobile service, in this Commonwealth shall not be liable for any civil damages for any act or omission resulting from rendering such service with or without charge related to emergency calls unless such act or omission was the result of such service provider's gross negligence or willful misconduct.

Any volunteer engaging in rescue or recovery work at a mine or any mine operator voluntarily providing personnel to engage in rescue or recovery work at a mine not owned or operated by such operator, shall not be liable for civil damages for acts or omissions resulting from the rendering of such rescue or recovery work in good faith unless such act or omission was the result of gross negligence or willful misconduct.

D. Nothing contained in this section shall be construed to provide immunity from liability arising out of the operation of a motor vehicle.

For the purposes of this section, the term "compensation" shall not be construed to include (i) the salaries of police, fire or other public officials or personnel who render such emergency assistance, (ii) the salaries or wages of employees of a coal producer engaging in emergency medical technician service or first aid service pursuant to the provisions of §§ 45.1-161.38, 45.1-161.101, 45.1-161.199 or § 45.1-161.263, (iii) complimentary lift tickets, food, lodging or other gifts provided as a gratuity to volunteer members of the National Ski Patrol System, Inc., by any resort, group or agency, or (iv) the salary of any person who~~, in compliance with § 32.1-111.14:1,~~ (a) ~~registers~~ *owns* an automated external defibrillator for the use at the scene of an emergency, (b) trains individuals, in courses approved by the Board of Health, to operate ~~registered~~ automated external defibrillators at the scene of emergencies, (c) orders automated external defibrillators for ~~subsequent registration and~~ use at the scene of emergencies, or (d) operates~~, in accordance with the training required by § 32.1-111.14:1, a registered~~ *an* automated external defibrillator at the scene of an emergency.

For the purposes of this section, an emergency medical care attendant or technician shall be deemed to include a person licensed or certified as such or its equivalent by any other state when he is performing services which he is licensed or certified to perform by such other state in caring for a patient in transit in this Commonwealth, which care originated in such other state.

Further, the public shall be urged to receive training on how to use cardiopulmonary resuscitation (CPR) and an automated external defibrillator (AED) in order to acquire the skills and confidence to respond to emergencies using both CPR and an AED.

2. That § 32.1-111.14:1 of the Code of Virginia is repealed.

3. That an emergency exists and this act is in force from its passage.