Campus Safety EXPERT SERIES

HOW TO EVALUATE Competing Technologies



Compare Alternatives



HOW TO EVALUATE COMPETING TECHNOLOGIES

A systematic approach will help to ensure your organization makes the right public safety and security technology purchasing decisions. *By Lt. John M. Weinstein*

Imagine this scenario: you are head of campus security and you are sitting in a meeting with the heads of IT and facilities, the school's vice president of finance and administration, and the college president. The purpose of your meeting is to consider the purchase of equipment to upgrade safety and security technologies.

There are three options on the table: a new video surveillance system, an electronic key/access control system and panic alarms for all classrooms and offices. Unfortunately, your budget is not sufficiently robust to select all three, so you need to evaluate what to buy. Further complicating the problem is that police and security want the camera system, facilities is supporting the access

control system and IT advocates the panic buttons. Each attendee can make a convincing argument in support of his or her desired option.

Often, in the byzantine world of procurement, all things being equal, the decision will reflect the personalities of the respective policy options, their alliances and their political and negotiation skills. As a result, the decision made may reflect the desires of the most capable and powerful advocate; not necessarily what's demonstrably best for the school.

This brief article provides an empirically verifiable evaluative framework to choose between equally attractive yet competing technologies. It also can be useful to vendors to suggest how to present their wares to make them most attractive to potential customers.

Determine Your Organization's Goals

So, what are some of the security goals of any campus? Seven are listed below, in no particular order, recognizing there may be more (such as creating a sense of community on campus or enhancing staff professionalism), and their priorities may change over time with dynamic trends, policies and experiences:

- 1. Create and maintain a safe and secure environment ("Environment" in Tables 1-4 on pages 4-8)
- 2. Enhance the school's reputation for safety ("Reputation")
- 3. Be prepared to respond to and recover from crises ("Response")
- 4. Avoid liability ("Liability")
- 5. Enhance situational awareness on campus to deter threatening activities ("Awareness")
- Enhance the campus community members' perception of safety ("Perception")
- Deter/respond to concerning behaviors ("Behaviors")

Identify Your Resources

All inputs needed to achieve a safe, secure and effective campus can be grouped into one of the following five categories: personnel, procedures, facilities, equipment and communications (and their integrating structure). For the sake of brevity, personnel and procedural factors will not be addressed further in this article, although they are integral to the operational success of whatever technologies are acquired and therefore must play a critical role in their assessment.

To illustrate this analytical methodology, let's consider potential technologies our campus might acquire. These items include but aren't limited to: ALL INPUTS NEEDED TO ACHIEVE A SAFE, SECURE AND EFFECTIVE CAMPUS CAN BE GROUPED INTO ONE OF THE FOLLOWING FIVE CATEGORIES: PERSONNEL, PROCEDURES, FACILITIES, EQUIPMENT AND COMMUNICATIONS (AND THEIR INTEGRATING STRUCTURE).

Facilities

- Emergency operations center
- Dispatch center
- Hardened and secure evacuation locations
- Hardened and distributed security office(s)
- First aid stations
- Remote security locations (indoors and outdoors, such as assembly areas)

Equipment

- Opaque film to cover windows in classes, offices, etc.
- Electronic locking/access control systems for classrooms and offices
- Gun-shot recognition system
- Automatic External Defibrillators (AEDs)
- Generators
- Tactical Emergency Casualty Care (TECC) kits

FACILITIES GOALS (TABLE 1)										
Means	Environment	Reputation	Response	Liability	Awareness	Perception	Behaviors			
EOC	1		1	1						
Dispatch Center	5	5	5	5	5	5				
Hardened Evacuation Centers	4	4	4	4		4				
Hardened Security Office	2	2	2	2		2				
First Aid Stations	2		2	2		2				
Remote Security Stations	0	0	0	0	0	0	0			
Number of Goals Affected	6	4	6	6	2	5	1			
Maximum Possible Score (number affected x 5)	30	20	30	30	10	25	5			
Score (Sum of Column)	14	11	14	14	5	13	0			
Proportion (Score ÷ Max Pos. Score)	.47	.55	.47	.47	.50	.52	0			

TWO KEY QUESTIONS TO BE CONSIDERED BY ACQUISITION AUTHORITIES ARE: WHICH INPUTS AFFECT THE INSTITUTION'S GOALS (I.E., DESIRED OUTPUTS); AND WHAT ARE THE STATUS AND CAPABILITY OF THOSE ASSETS (ASSUMING THEY ARE PRESENT ON CAMPUS)?

- Bollards to block entrances
- Speed bumps
- Security cameras

Communications

- Alert system
- Mobile safety app
- Hand-held radios for parking, facilities, wardens and administrators in addition to radios for police and security
- Alarm systems (internal)
- Panic buttons
- AV broadcast systems
- External emergency phones
- Loudspeakers

EQUIPMENT GOALS (TABLE 2)									
Means	Environment	Reputation	Response	Liability	Awareness	Perception	Behaviors		
Opaque Film	4			4		4			
Electronic Locks	3	3		3		3			
Gun-shot Recognition		0		0		0			
AEDs	5	5		5					
Generators	5		5						
TECC for Classrooms	1	1	1	1		1			
Bollards	3	3		3		3			
Cameras	4	4	4	4	4	4	4		
Number of Goals Affected	7	6	2	8	1	6	1		
Maximum Possible Score (number affected x 5)	35	30	10	40	5	30	5		
Score (Sum of Column)	25	16	5	25	4	15	4		
Proportion (Score ÷ Max Pos. Score)	.71	.53	.50	.62	.80	.50	.80		

Two key questions to be considered by acquisition authorities are: which inputs affect the institution's goals (i.e., desired outputs); and what are the status and capability of those assets (assuming they are present on campus)?

Tables 1-3 show which inputs affect which outputs of a hypothetical campus. Those that do are color-coded green, yellow or red, depending on whether they are fully (green), partially (yellow) or not mission-capable (red). Assets receive the following (judgmental) point scores: 5 — highly mission capable; 4 — mission capable; 3 — almost mission capable; 2 — partially mission capable; 1 — available asset but not mission capable; 0 — not present on campus. Notional ratings are applied to the tables.

These tables also show how remote security/police stations, a camera system, a mobile safety app and panic buttons each affect all seven of the iden-

COMMUNICATION GOALS (TABLE 3)									
Means	Environment	Reputation	Response	Liability	Awareness	Perception	Behaviors		
Alert System	5	5	5	5	5	5			
Mobile Safety App	0	0	0	0	0	0	0		
Hand-Held Radios	5	5	5	5		5			
Alarm Systems	5	5		5	5	5			
Panic Alarms/ Buttons	5	5	5	5	5	5	5		
AV Broadcast System	2	2	2	2	2	2			
Loud Speakers	3	3	3	3	3	3			
External Emergency Phones	2	2		2		2			
Number of Goals Affected	8	8	6	8	6	8	2		
Maximum Possible Score (number affected x 5)	40	40	30	40	30	40	10		
Score (Sum of Column)	27	27	20	27	20	27	5		
Proportion (Score ÷ Max Pos. Score)	.68	.68	.67	.68	.67	.68	.50		

SINCE REMOTE SECURITY STATIONS AND A MOBILE SAFETY APP ARE NON-MISSION CAPABLE INPUTS AFFECTING TWO LOWER ACHIEVEMENT GOALS, THEY DESERVE PRIORITY CONSIDERATION AS INITIATIVES TO IMPROVE AGENCY GOAL ACHIEVEMENT. tified institutional goals; and how a dispatch center, alert system and an AV system and loudspeakers each affect six of the seven goals. The following assets each affect five goals: hardened security/police office, hardened evacuation centers and TECC units located in classes. Generators have the lowest impact according to the assessment of this particular campus.

For the sake of illustration, the inputs at our mythical institution are rated with regards to their mission capability as follows. This is just an example; your evaluations of these technologies could be different:

Fully mission capable (Green, and receiving 4 – 5 points based on their full capability status as low [4] or high [5]):

- Dispatch center (5 points)
- Hardened evacuation centers (4)
- Opaque film over windows and glass (4)
- AEDs (5)
- Generators (5)
- Camera surveillance system (4)
- Alert system (5)
- Hand-held radios for police and wardens (5)
- Alarm systems (5)
- Panic buttons (5)

Partially mission capable (Yellow, and receiving 2 – 3 points based on their low or high partial capability status.)

- Hardened police/security main office (2 points)
- First aid stations (2)
- Electronic locking systems (3)
- Bollards (3)
- AV broadcast system (2)
- External loudspeakers (3)
- External emergency phones (2)

Not mission capable (Red and receiving 0-1 points depending on needing but not having a capability [0] or having an inadequate capability [1])

- Emergency operations center (1)
- Remote security stations, distributed throughout campuses (0)
- Gun-shot recognition system (0)
- Tactical Emergency Casualty Care (TECC) kits for classrooms (1)
- Mobile safety app for each member of the college community (0)

By counting the numbers in each column (i.e., each goal), we can identify how many inputs affect that given goal. The number of inputs affecting each goal, that goal's maximum score, its actual score and the proportion of the sum of the inputs divided by the maximum total appears in Table 4. By counting the numbers in each column (i.e., each goal), we can identify how many inputs affect that given goal. If each affecting input were in perfect condition (i.e., receiving a score of 5), the total maximum score for that goal would be 5 multiplied (x) by the number of affecting inputs.

Using the first goal, "Creating a safer environment," as an example, 21 inputs affect that goal, so a maximum score would be 105 points. If you add the actual input scores in that column, the sum, 66 equals a proportion of .63 of the maximum total score.

The number of inputs affecting each goal, that goal's maximum score, its actual score and the proportion of the sum of the inputs divided by the maximum total appears in Table 4.

According to this analysis, the goals of enhancing situational awareness and creating a safer environment (.64 and .63 respectively), are in relatively good shape. The school's ability to avoid liability, enhance its reputation and improve the perception of safety trail slightly behind at .60, .60 and .58 respectively. The ability to respond (.56) and deter concerning behavior (.45) are less strong.

OVERALL GOALS (TABLE 4)											
Means	Environment	Reputation	Response	Liability	Awareness	Perception	Behaviors				
Number of Goals Affected	21	18	14	22	9	19	4				
Maximum Possible Score (number affected x 5)	105	90	70	110	45	95	20				
Score (Sum of Column)	66	54	39	66	29	55	9				
Proportion (Score ÷ Max Pos. Score)	.63	.60	.56	.60	.64	.58	.45				

Now what?

Let's assume a leader decides to strengthen protections against liability and improve the campus' ability to deter concerning behaviors. Since the agency scores well on many response items, it would make sense for the leader to pursue improvements in inputs that affect these two goals but are not mission capable; namely the establishment of an EOC, establishing remote security stations, gun-shot detectors, locating TECC kits in classrooms, and providing a mobile safety app to college community members.

Similarly, any effort to improve the ability to deter or respond to concerning behaviors would be best focused on areas where mission capability is low: remote security stations and a mobile safety app. Since remote security stations and a mobile safety app are non-mission capable inputs affecting two lower achievement goals, they deserve priority consideration as initiatives to improve agency goal achievement.

Of course, the leader is still likely to be constrained by finances, so a set of criteria is needed to identify ways to "rack and stack" desirable initiatives.

In addition to identifying how many goals are affected by non-mission capable inputs, a leader will consider the following discriminators:

- **Cost:** What improvements can be made at no or low cost? Providing a mobile safety app is likely to be less expensive than building a new camera surveillance system or remote security stations.
- Implementation times: How long will it take to acquire, implement and train staff members on new initiatives? Installing bollards, getting people to sign up for the school's alerting system and installing opaque film can be done more quickly than upgrading a dispatch center.
- Lifecycle: How long will the initiative last, and what are its mean times between failure? Bollards and opaque film, for instance, are durable and not prone to failure. On the other hand, cameras must be replaced and software upgrades are required periodically.
- **Maintenance costs:** Bollards and film require less maintenance than more technically sophisticated systems.
- **Predicates:** Some initiatives logically precede others, so it would be unwise to commit resources to an initiative that depends on another. For instance, when one considers the four phases of any emergency (i.e., deterrence/prevention, response, mitigation and recovery), it would behoove a leader to invest first in inputs that enhance situational awareness in an effort to prevent disasters. Similarly, liability will be reduced after other initiatives are accomplished.

SOME INITIATIVES LOGICALLY PRECEDE OTHERS, SO IT WOULD BE UNWISE TO COMMIT RESOURCES TO AN INITIATIVE THAT DEPENDS ON ANOTHER. • Shared costs: One strategy to improve safety and security on campus is to adopt a community approach to security that recognizes that many actors beyond campus police and security (such as IT, facilities, parking, mental health, registrar, emergency management and others) have critical roles to play in all four phases of an emergency.

Don't Forget About Policies and Training

This brief overview has identified a systematic approach for evaluating technology. What it has not addressed is the non-technical, but equally important factors of practicing with equipment, writing policies to govern its use and maintenance, instituting processes to identify best practices and lessons learned, and socializing department members and school decision-makers on the new technology to encourage their support.

In some ways, these non-technical considerations can be the most vexing and elusive. Building support to incorporate new technology and picking the right technologies that upgrade performance are simultaneously the toughest and most rewarding aspects of leadership.

About the Author:

Lt. John M. Weinstein is the commander of strategic planning and outreach for the Northern Virginia Community College Police Department. He has a PhD in international politics and is a nationally recognized expert in nuclear weapons command/control. He contributes regularly to Campus Safety and serves on its editorial board. INSTALLING BOLLARDS, GETTING PEOPLE TO SIGN UP FOR THE SCHOOL'S ALERTING SYSTEM AND INSTALLING OPAQUE FILM CAN BE DONE MORE QUICKLY THAN UPGRADING A DISPATCH CENTER.

TABLES I-4 (FOR REFERENCE)

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