ACCESS CONTROL SECURITY UPGRADES

Capital Project Proposal 2017-2019

Active Minds Changing Lives

WESTERN
WASHINGTON UNIVERSITY

Institution
Western Washington University
Project Title
Access Control Security Upgrades
Project Location (City)
Bellingham

1. Problem Statement (short description of the project – the needs and the benefits)

Western's existing access control system, which is installed in roughly 30% of campus buildings, does not meet current and future operational needs. The access system is fully integrated with our campus fire alarm system, meaning both functions share the same fiber optic cabling and system software (Edwards Systems Technology). In 2013, Western was informed that Edwards would be phasing out the access control portion of its software with the next system upgrade of the fire alarm system, thus Western's access control system would no longer be supported. The obsolescence of the access control software and acquisition of modern access software necessitates complete separation of the access control function from the fire alarm function in order to preserve the full functionality of the fire alarm system. In addition, with increasing attention to active shooter incidents around the country, Western has identified a need to expand its access control functionality across campus, in particular to exterior doors in order to facilitate more agile and effective emergency response.

This project is proposed to accomplish the following:

1. Enable full functionality and software currency of our fire alarm system by completely segregating all existing electronic access control from the fire alarm system.
2. Convert all existing building access controlled doors to a new access control system.
3. Provide centralized lock down functionality to facilitate appropriate response capabilities in the event of a campus emergency. This will be accomplished through expansion of electronic control to all exterior doors of major academic buildings and designated high security internal doors within those buildings.
4. Improve campus building access and security by consolidating existing three generations of keying systems into a single, more simplified system designed for current campus size and operations. This will entail rekeying all internal academic doors to bring all academic buildings under a single grand master keying system.
5. Reduce operating costs by reducing or eliminating the need for manual locking and opening of academic buildings on a daily basis.

2. History of the project or facility

Access control security upgrades have been on Western's Ten-Year Plan since 2014. It was considered for capital funding to the state Legislature as part of WWU's 2015-17 biennial budget, and was submitted as part of Western's 2016 supplemental capital budget request but was not funded.

This project scope represents a convergence of two critical infrastructure challenges: First, Western's need to increase our capacity to protect the health and well-being of students, faculty, staff, and visitors on campus; second, the looming obsolescence of Western's existing access control software is a threat to the operational viability of our fire alarm system.

Active shooter incidents are increasing at an alarming rate, with university and college campuses being some of the most vulnerable locations for such tragedies to occur. Western's Emergency Response Preparedness team has recently determined the highest return on investment for mitigating risk and protecting over 15,000 students, faculty and staff on campus related to an Active Shooter incident is to have the ability to electronically lockdown all the buildings on campus as efficiently and quickly as possible. The University has determined that the ability to electronically lock down campus is a high priority and needs to be put in place as soon as possible.

- *The FBI's September 16, 2013 "Study of Active Shooter Incidents in the United States Between 2000 and 2013" (Appendix B) highlights that there were 160 total active shooter incidents. Of those incidents, an average of 11.4 occurs annually with an increasing trend.*
- *The second largest grouping (approximately 24.4%) occurred in educational settings of which 7.5% were institutions of higher education.*
- *Nationally, educational facilities account for some of the higher casualty counts. For example, the 2007 incident at Virginia Polytechnic Institute and State University in Blacksburg, Virginia (Virginia Tech) resulted in 32 killed and 17 wounded. Another incident occurred in 2008 at Northern Illinois University in DeKalb, Illinois. That incident resulted in 5 killed and 16 wounded.*
- *Locally, in June 2014, a shooting at Seattle Pacific University in Seattle resulted in one student killed and three injured.*

Western's existing electronic access control system does not provide sufficient functionality to facilitate appropriate response capabilities in the event of a campus emergency. The proposed access controls conversion and upgrade shall provide for campus-wide lockdown capability of both academic and non-academic (funded from other sources) buildings to be initiated by Public Safety.

Roughly two-thirds of campus exterior doors and nearly all interior doors have no electronic access functionality, meaning access is via traditional brass keys. Western's brass key system is actually three generations of key systems dating back to the late 70's when Western was less than half its current size. Aside from the obvious challenges of managing three separate systems, traditional brass keying systems have inherent vulnerabilities and administrative challenges that can be reduced or eliminated with electronic access. When brass keys are lost, stolen, or simply not returned to the University, the most effective security response is to replace all locks which can be opened with that particular key – a very high cost activity for both materials and labor. With electronic access, the corrective action entails simple and inexpensive keystrokes within the software.

3. University programs addressed or encompassed by the project

All programs on the Western campus are operated out of and depend on safe, reliable, and fully functioning buildings. As infrastructure systems, the fire alarm and access control systems described in this proposal are by nature tied to all programs, and support every program on campus.

Campus auxiliary programs, while beneficiaries of the infrastructure, will bear the costs of converting their buildings and doors to the new electronic access control system.

4. Significant Health, Safety, and Code Issues:

As a complex university, Western Washington's building inventory includes nearly all types of occupancy found in the building code. Chapter 9 of the International Building Code describes the requirements for manual and automatic fire alarm systems in various building occupancies; Chapter 9 of the International Fire Code outlines the application, installation, performance, and maintenance of fire alarm systems; National Fire Protection Association standard NFPA72 – National Fire Alarm and Signaling Code – provides the design standard for installed systems. In order to maintain compliance with the life safety code with a fully functioning fire alarm system, Western must fully segregate the fire alarm and access control functionality.

From the safety and security standpoint, WWU has determined that emergency lockdown capability during an active shooter event is of paramount importance. Recommendations from active shooter analyses across the country have concluded that locking, blocking, or otherwise obstructing access to a classroom is a highly effective deterrent to an active shooter – thus an important lifesaving functionality. This new lockdown functionality will complement Western's emergency preparedness and response plans, which include text, cell phone, and voice notification.

Although a small subset of this project, this scope will also improve ADA compliance through modification of existing hardware. As we rekey internal doors, we will also replace (where necessary) existing traditional door knobs with ADA compliant openers.

5. Evidence of increased repairs and/or service interruption:

Fire Alarm System Maintenance: The integrated fire alarm/access control software is a Windows XP based system, which has not been supported by Microsoft since April 2014. In conjunction with the end of Microsoft support, Edwards stopped issuing software updates to the combined fire/access software in late 2013. Western is currently operating our combined system on a stand-alone Windows XP computer, with three brand new XP computers in ready standby in case of failure. There have been numerous security patches and two significant software revisions issued to the fire system software, but Western cannot take advantage of these updates until access control is completely separated from fire detection.

While Western has been able to respond to software system glitches with existing resources and technology, we cannot responsibly wait until the fire system experiences frequent failures before proceeding with corrective action.

6. Impact on Institutional Operations without the Infrastructure Project:

This project impacts operations in two ways. A safe and reliable fire alarm system and a fully capable access control system are both equally essential to campus operations.

In order to ensure full fire alarm functionality, Western must remove access control from the fire system. Without a replacement access control system, Western will lose all current electronic access functionality. Such a condition is considered unacceptable from an emergency response standpoint, from the standpoint of effective & efficient security systems, and from the standpoint of public relations.

Having determined that the ability to electronically lock down campus during an active shooter emergency is a critical mitigating functionality, any reduction or removal of functionality will be a clear step backwards in emergency preparedness efforts.

Although considered a non-viable solution, moving backwards to a traditional brass key system greatly increases operating costs and liability. In the event of a lost electronic device, electronic access control enables an immediate elimination of access privileges, while loss of a brass key may entail physical replacement of several, if not dozens of locks and keys at the cost of hundreds of dollars per new lock core.

A safe, secure, and welcoming campus is critical to the success of Western Washington University. Today's parents and students expect a full suite of safety and security protections on campus, and elimination of such capability would inevitably reflect poorly on Western's reputation as well as impact our recruiting and retention efforts.

7. Reasonable Estimate:

The cost estimates are based on actual costs seen in recent campus work. During FY13, Western completed a minor works capital funded project that brought electronic access control into two campus buildings. Per unit costs in that project are extrapolated to produce this much larger project estimate in many more buildings. See Appendix C.

8. Engineering Study:

In 2013, Western contracted with TRUSYS, an operational security assessment company, to define a roadmap for conversion of our existing access control system. This capital request reflects the recommendations of that study. See Appendix G.

9. Supports Facilities Plan:

In order to provide the opportunity for Washington's residents to complete a post-secondary education program (Results Washington Goal 1), we must first provide a learning environment that is attractive to prospective students and parents, conducive to learning once those students are on campus, and always provide a sense of personal well-being and safety (Results Washington Goal 4) to everyone on campus. See Appendix D.

Western's institutional master planning, while focused on long range development zoning and relationships with surrounding neighbors, also contains six guiding principles for that development. http://www.wwu.edu/fm/CampusStandards/PlanningPrinciples/index.shtml this project is fully aligned with Principle #3 – "Provide convenient and safe access to and through the campus for the University's guests, faculty, staff and students." See Appendix E.

As stated earlier, all academic and research programs on the Western campus are operated out of and depend on safe, reliable, and fully functioning buildings. As stewards of state resources Western is expected and required to provide a safe learning and working environment. Highly qualified faculty, motivated students, and expert staff all inherently depend on fully functioning, highly capable infrastructure systems.

The proposed project supports the campus Access Control Policy (Appendix F) as well as that policy's supporting standards and procedures.

10. Resource Efficiency and Sustainability:

Western will recognize energy conservation with the enhanced ability to manage access control of buildings. By limiting unauthorized access to academic buildings, conservation of resources can be managed more efficiently and effectively. Also, exterior doors will not be able to be propped open after hours, conserving energy within the buildings.

Access Control Security Upgrade

Appendix Contents

Appendix A

OFM

380 - Western Washington University
Capital Project Request

2017-19 Biennium

*

Version: WV Working Version 2017-19 Budget Req

Report Number: CBS002
Date Run: 7/29/2016 1:18PM

Project Number: **30000604**
Project Title: **Access Control Security Upgrades**

Description

Starting Fiscal Year: 2018
Project Class: Program
Agency Priority: 5

Project Summary

The Access Control Security Upgrades project will provide critical safety and security protections for the Western campus by replacing and expanding the University's current access control system which is integrated with the campus fire alarm system. The current access control system will no longer be supported when necessary system upgrades are made to the campus fire alarm system.

Project Description

A safe, secure, and welcoming campus is critical to the success of Western Washington University. Today's parents and students expect a full suite of safety and security protections on campus. This project scope represents a convergence of two critical infrastructure challenges: first, Western's need to increase our capacity to protect the health and well-being of students, faculty, staff, and visitors with a campus-wide access control system; second, the looming obsolescence of Western's existing access control software is a threat to the operational viability of our fire alarm system.

Our current access control system, which is installed in roughly 30% of campus buildings, is integrated with the fire alarm system provided by Edwards Systems Technology. The two systems share the same fiber optic cabling and system software. However Edwards Systems Technology is phasing out the access control portion of its software with the next fire alarm system upgrade, and Western's access control system will no longer be supported. The obsolescence of the access control software and acquisition of modern access software necessitates complete separation of the access control function from the fire alarm function in order to preserve the full functionality of the fire alarm system. In addition, with increasing attention to active shooter incidents around the country, Western has identified a need to expand its access control functionality across campus, in particular to exterior doors in order to facilitate more agile and effective emergency response.

This project is proposed to accomplish the following:

1. **Enable full functionality and software currency of our fire alarm system by completely segregating all existing electronic access control from the fire alarm system**. There have been numerous security patches and two significant software revisions issued to the fire system software, but Western cannot take advantage of these updates until access control is completely separated from fire detection. While Western has been able to respond to software system glitches with existing resources and technology, we cannot responsibly wait until the fire system experiences frequent failures before proceeding with corrective action.

2. **Convert all existing building access controlled doors to a new access control system and expand electronic control to all exterior doors of major academic buildings and designated high security doors within those buildings.**

3. **Provide centralized lock down functionality to facilitate appropriate response capabilities in the event of a campus emergency**. Active shooter incidents are increasing at an alarming rate, with university and college campuses being some of the most vulnerable locations for such tragedies to occur. Western's Emergency Response Preparedness team has recently determined the highest return on investment for mitigating risk and protecting over 10,000 students, faculty and staff on campus related to an Active Shooter incident is to have the ability to electronically lockdown all the buildings on campus as efficiently and quickly as possible. The University has determined that the ability to electronically lock down campus is a high priority and needs to be put in place as soon as possible.

4. **Improve campus building access and security by consolidating existing three generations of keying systems into a single, more simplified system designed for current campus size and operations**. This will entail rekeying all internal academic doors to bring all academic buildings under a single grand master keying system. As we rekey internal doors, we will also replace (where necessary) existing traditional door knobs with ADA compliant openers.

5. **Reduce operating costs** by reducing or eliminating the need for manual locking and opening of academic buildings on a daily basis.

OFM

380 - Western Washington University
Capital Project Request
2017-19 Biennium

*

Version: WV Working Version 2017-19 Budget Req

Report Number: CBS002
Date Run: 7/29/2016 1:18PM

Project Number: **30000604**
Project Title: **Access Control Security Upgrades**

Description

Campus auxiliary programs, while beneficiaries of the infrastructure, will bear the costs of converting their buildings and doors to the new electronic access control system.

Project Schedule: September 2017 – March 2019

Location
City: Bellingham **County:** Whatcom **Legislative District:** 040

Project Type
Infrastructure (Major Projects)

Growth Management impacts
none

New Facility: No

Funding

Acct Code	Account Title	Estimated Total	Expenditures Prior Biennium	Expenditures Current Biennium	2017-19 Fiscal Period Reapprops	2017-19 Fiscal Period New Approps
057-1	State Bldg Constr-State	7,200,000				7,200,000
	Total	**7,200,000**	**0**	**0**	**0**	**7,200,000**

Acct Code	Account Title	Future Fiscal Periods 2019-21	2021-23	2023-25	2025-27
057-1	State Bldg Constr-State				
	Total	**0**	**0**	**0**	**0**

Operating Impacts

No Operating Impact

STATE OF WASHINGTON
AGENCY / INSTITUTION PROJECT COST SUMMARY

Agency	Western Washingtn University
Project Name	Access Control Security Upgrades
OFM Project Number	30000604

Contact Information	
Name	Rick Benner, FAIA
Phone Number	(360) 650-3550
Email	rick.benner@wwu.edu

Statistics			
Gross Square Feet		MACC per Square Foot	
Usable Square Feet		Escalated MACC per Square Foot	
Space Efficiency		A/E Fee Class	B
Construction Type	Other Sch. B Projects	A/E Fee Percentage	11.81%
Remodel	Yes	Projected Life of Asset (Years)	50
Additional Project Details			
Alternative Public Works Project	No	Art Requirement Applies	No
Inflation Rate	2.80%	Higher Ed Institution	No
Sales Tax Rate %	8.70%	Location Used for Tax Rate	
Contingency Rate	10%		
Base Month	July-16		
Project Administered By	Agency		

Schedule			
Predesign Start		Predesign End	
Design Start	September-17	Design End	May-18
Construction Start	June-18	Construction End	March-19
Construction Duration	9 Months		

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Project Cost Estimate

Total Project	**$6,773,630**	Total Project Escalated	**$7,199,806**
		Rounded Escalated Total	**$7,200,000**

STATE OF WASHINGTON
AGENCY / INSTITUTION PROJECT COST SUMMARY

Agency	Western Washingtn University
Project Name	Access Control Security Upgrades
OFM Project Number	30000604

Cost Estimate Summary

Acquisition			
Acquisition Subtotal	**$0**	**Acquisition Subtotal Escalated**	**$0**

Consultant Services			
Predesign Services	$0		
A/E Basic Design Services	$400,495		
Extra Services	$133,296		
Other Services	$179,933		
Design Services Contingency	$71,372		
Consultant Services Subtotal	**$785,096**	**Consultant Services Subtotal Escalated**	**$824,089**

Construction			
Construction Contingencies	$446,792	Construction Contingencies Escalated	$475,968
Maximum Allowable Construction Cost (MACC)	$4,467,924	Maximum Allowable Construction Cost (MACC) Escalated	$4,759,680
Sales Tax	$427,580	Sales Tax Escalated	$455,502
Construction Subtotal	**$5,342,297**	**Construction Subtotal Escalated**	**$5,691,150**

Equipment			
Equipment	$0		
Sales Tax	$0		
Non-Taxable Items	$0		
Equipment Subtotal	**$0**	**Equipment Subtotal Escalated**	**$0**

Artwork			
Artwork Subtotal	**$0**	**Artwork Subtotal Escalated**	**$0**

Agency Project Administration			
Agency Project Administration Subtotal	$291,236		
DES Additional Services Subtotal	$0		
Other Project Admin Costs	$0		
Project Administration Subtotal	**$291,236**	**Project Administation Subtotal Escalated**	**$310,255**

Other Costs			
Other Costs Subtotal	**$355,000**	**Other Costs Subtotal Escalated**	**$374,312**

Project Cost Estimate

Total Project	**$6,773,630**	Total Project Escalated	**$7,199,806**
		Rounded Escalated Total	**$7,200,000**

Cost Estimate Details

Acquisition Costs					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Purchase/Lease					
Appraisal and Closing					
Right of Way					
Demolition					
Pre-Site Development					
Other					
Insert Row Here					
ACQUISITION TOTAL	**$0**		**NA**	**$0**	

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Cost Estimate Details

Consultant Services				
Item	**Base Amount**	**Escalation Factor**	**Escalated Cost**	**Notes**
1) Pre-Schematic Design Services				
Programming/Site Analysis				
Environmental Analysis				
Predesign Study				
Other				
Insert Row Here				
Sub TOTAL	**$0**	**1.0328**	**$0**	Escalated to Design Start
2) Construction Documents				
A/E Basic Design Services	$400,495			69% of A/E Basic Services
Other				
Insert Row Here				
Sub TOTAL	**$400,495**	**1.0423**	**$417,437**	Escalated to Mid-Design
3) Extra Services				
Civil Design (Above Basic Svcs)				
Geotechnical Investigation				
Commissioning				
Site Survey				
Testing				
LEED Services				
Voice/Data Consultant				
Value Engineering				
Constructability Review				
Environmental Mitigation (EIS)				
Landscape Consultant				
Security Consultant	$74,796			
Travel & Per Diem	$50,000			
Advertising	$3,500			
Document Reproduction	$5,000			
Insert Row Here				
Sub TOTAL	**$133,296**	**1.0423**	**$138,935**	Escalated to Mid-Design
4) Other Services				
Bid/Construction/Closeout	$179,933			31% of A/E Basic Services
HVAC Balancing				
Staffing				
Other				
Insert Row Here				
Sub TOTAL	**$179,933**	**1.0653**	**$191,683**	Escalated to Mid-Const.
5) Design Services Contingency				
Design Services Contingency	$71,372			
Other				
Insert Row Here				
Sub TOTAL	**$71,372**	**1.0653**	**$76,034**	Escalated to Mid-Const.
CONSULTANT SERVICES TOTAL	**$785,096**		**$824,089**	

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Cost Estimate Details

Construction Contracts				
Item	**Base Amount**	**Escalation Factor**	**Escalated Cost**	**Notes**
1) Site Work				
G10 - Site Preparation				
G20 - Site Improvements				
G30 - Site Mechanical Utilities				
G40 - Site Electrical Utilities				
G60 - Other Site Construction				
Other				
Insert Row Here				
Sub TOTAL	**$0**	**1.0544**	**$0**	
2) Related Project Costs				
Offsite Improvements				
City Utilities Relocation				
Parking Mitigation				
Stormwater Retention/Detention				
Other				
Insert Row Here				
Sub TOTAL	**$0**	**1.0544**	**$0**	
3) Facility Construction				
A10 - Foundations				
A20 - Basement Construction				
B10 - Superstructure				
B20 - Exterior Closure				
B30 - Roofing				
C10 - Interior Construction				
C20 - Stairs				
C30 - Interior Finishes				
D10 - Conveying				
D20 - Plumbing Systems				
D30 - HVAC Systems				
D40 - Fire Protection Systems				
D50 - Electrical Systems				
F10 - Special Construction				
F20 - Selective Demolition				
General Conditions				
MACC	$4,467,924			
Insert Row Here				
Sub TOTAL	**$4,467,924**	**1.0653**	**$4,759,680**	
4) Maximum Allowable Construction Cost				
MACC Sub TOTAL	**$4,467,924**		**$4,759,680**	

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7) Construction Contingency				
Allowance for Change Orders	$446,792			
Other				
Insert Row Here				
Sub TOTAL	**$446,792**	**1.0653**	**$475,968**	
8) Non-Taxable Items				
Other				
Insert Row Here				
Sub TOTAL	**$0**	**1.0653**	**$0**	
Sales Tax				
Sub TOTAL	**$427,580**		**$455,502**	
CONSTRUCTION CONTRACTS TOTAL	**$5,342,297**		**$5,691,150**	

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Cost Estimate Details

Equipment				
Item	**Base Amount**	**Escalation Factor**	**Escalated Cost**	**Notes**
E10 - Equipment				
E20 - Furnishings				
F10 - Special Construction				
Other				
Insert Row Here				
Sub TOTAL	**$0**	**1.0653**	**$0**	
1) Non Taxable Items				
Other				
Insert Row Here				
Sub TOTAL	**$0**	**1.0653**	**$0**	
Sales Tax				
Sub TOTAL	**$0**		**$0**	
EQUIPMENT TOTAL	**$0**		**$0**	

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Cost Estimate Details

Artwork					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Project Artwork	$0				0.5% of Escalated MACC for new construction
Higher Ed Artwork	$0				0.5% of Escalated MACC for new and renewal construction
Other					
Insert Row Here					
ARTWORK TOTAL	**$0**		**NA**	**$0**	

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Cost Estimate Details

Project Management					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Agency Project Management	$291,236				
Additional Services					
Other					
Insert Row Here					
PROJECT MANAGEMENT TOTAL	**$291,236**		**1.0653**	**$310,255**	

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Cost Estimate Details

Other Costs					
Item	**Base Amount**		**Escalation Factor**	**Escalated Cost**	**Notes**
Mitigation Costs					
Hazardous Material Remediation/Removal					
Historic and Archeological Mitigation					
Plan Review	$55,000				
M & O Assist	$300,000				
Insert Row Here					
OTHER COSTS TOTAL	**$355,000**		**1.0544**	**$374,312**	

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C-100(2016)
Additional Notes

Tab A. Acquisition
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Tab B. Consultant Services
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Tab C. Construction Contracts
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Tab D. Equipment
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Tab E. Artwork
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Tab F. Project Management
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Tab G. Other Costs
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Appendix B

U.S. Department of Justice
Federal Bureau of Investigation

A Study of Active Shooter Incidents in the United States Between 2000 and 2013

September 16, 2013
Washington Navy Yard,
Washington, D.C.

Acknowledgments

This publication is in the public domain. Authorization to reproduce this publication in whole or in part is granted. While permission to reprint is not necessary, the citation should be: Blair, J. Pete, and Schweit, Katherine W. (2014). A Study of Active Shooter Incidents, 2000 - 2013. Texas State University and Federal Bureau of Investigation, U.S. Department of Justice, Washington D.C. 2014.

Special Acknowledgments are extended to several individuals who provided research and editing assistance. Particular appreciation is extended to the primary research team of Lieutenant Commander David Knoff of the California Highway Patrol, Deputy Dennis Jahnke of the Hennepin County (Minnesota) Sheriff's Office, FBI Honors Intern Jessica Seay, and FBI Supervisory Intelligence Analyst Deborah Cryan. M. Hunter Martaindale, M.S., of the Advanced Law Enforcement Rapid Response Training Center at Texas State University (TXST) provided critical analysis as part of the primary research team, contributing input that assisted the team in understanding the purposes and research parameters used in a previously published active shooter study released by TXST. In addition, the following employees of the FBI are recognized for their research assistance: LaTasha Houston, Della Mays-Prince, Alvin Thibodeaux, Stephanie Preshlock, and Kerry Riley. Appreciation also is extended to FBI employees Kathryn Crotts and Brian Jackson, and to Jeffrey R. McCrehan and Andrew C. Ames for their final editing expertise.

TEXAS STATE UNIVERSITY
The rising STAR *of Texas*

A Study of Active Shooter Incidents in the United States between 2000 and 2013

Click on a link above to jump to a page.

On the cover: An FBI evidence response team collects evidence at Building 197 at the Washington Navy Yard. A gunman killed 12 people at the base Sept. 16, 2013. (U.S. Navy photo by Mass Communication Specialist 2nd Class Pedro A. Rodriguez/Released)

Introduction

In 2013, the president signed into law the Investigative Assistance for Violent Crimes Act of 2012, which granted the attorney general the authority to assist in the investigation of "violent acts and shootings occurring in a place of public use" and in the investigation of "mass killings and attempted mass killings at the request of an appropriate law enforcement official of a state or political subdivision."[1]

To provide further clarity on these threats, the Federal Bureau of Investigation (FBI) in 2014 initiated a study of "active shooter" incidents[2]. The goal of the FBI study is to provide federal, state, and local law enforcement with data so they can better understand how to prevent, prepare for, respond to, and recover from these incidents.

Photo: Shane T. McCoy/U.S. Marshals

Active shooter is a term used by law enforcement to describe a situation in which a shooting is in progress and an aspect of the crime may affect the protocols used in responding to and reacting at the scene of the incident. Unlike a defined crime, such as a murder or mass killing, the active aspect inherently implies that both law enforcement personnel and citizens have the potential to affect the outcome of the event based upon their responses.

1 Investigative Assistance for Violent Crimes Act of 2012, 28 USC 530C(b)(1)(M)(i).

2 The FBI's Uniform Crime Reporting system does not capture data specific to active shooters but rather is data derived from more than 18,000 city, university/college, country, state, tribal, and federal law enforcement agencies that voluntarily report monthly on criminal activity in their jurisdictions.

The agreed-upon definition of an active shooter by U.S. government agencies—including the White House, U.S. Department of Justice/FBI, U.S. Department of Education, and U.S. Department of Homeland Security/Federal Emergency Management Agency—is "an individual actively engaged in killing or attempting to kill people in a confined and populated area."[3] Implicit in this definition is that the subject's criminal actions involve the use of firearms.[4]

For purposes of its study, the FBI extended this definition to include individuals, because some incidents involved two or more shooters. Though the federal definition includes the word "confined," the FBI excluded this word in its study, as the term confined could omit incidents that occurred outside a building.

Whether inside or out, these incidents still posed a threat to both law enforcement and the citizens they seek to protect.[5]

This is not a study of mass killings or mass shootings, but rather a study of a specific type of shooting situation law enforcement and the public may face. Incidents identified in this study do not encompass all gun-related situations; therefore caution should be taken when using this information without placing it in context. Specifically, shootings that resulted from gang or drug violence—pervasive, long-tracked, criminal acts that could also affect the public—were not included in this study. In addition, other gun-related shootings were not included when those incidents appeared generally not to have put others in peril (e.g., the accidental discharge of a firearm in a school building or a person who chose to publicly commit suicide in a parking lot). The study does not encompass all mass killings or shootings in public places and therefore is limited in its scope.[6] Nonetheless, it was undertaken to provide clarity and data of value to both law enforcement and citizens as they seek to stop these threats and save lives during active shooter incidents.[7]

As a result, the FBI identified 160 active shooter incidents that occurred in the United States between 2000 and 2013.[8] Though additional active shooter incidents may have occurred during this time period, the FBI is confident this research captured the vast majority of incidents falling within the search criteria. To gather information for this study, researchers relied on official police records (where available), FBI records, and open sources.[9] The time span researched was intended to provide substantive results to aid in preparedness and response efforts. This study is not intended to explore all facets of active shooter incidents, but rather is intended to provide a baseline to guide federal, state, tribal, and campus law enforcement along with other first responders, corporations, educators, and the general public to a better understanding of active shooter incidents.

3 White House, http://www.whitehouse.gov/sites/default/files/docs/developing_eops_for_houses_of_worship_final.pdf; Department of Justice/FBI, http://www.fbi.gov/about-us/cirg/active-shooter-and-mass-casualty-incidents; Department of Homeland Security/Federal Emergency Management Agency, http://www.dhs.gov/active-shooter-preparedness and http://www.fema.gov/media-library/assets/documents/33597; Department of Education, http://www2.ed.gov/about/offices/list/oese/oshs/rems-k-12-guide.pdf.

4 Incidents involving only knives, vehicles, and other weapons were not part of this study.

5 See Appendix B for the full methodology used to select incidents.

6 Other private and public entities have studied mass casualty incidents, murder rates, and school or workplace violence. (e.g., Campus Attacks: Targeted Violence Affecting Institutions of Higher Education, a joint publication of U.S. Secret Service, U.S. Department of Education, and Federal Bureau of Investigation, 2010, http://rems.ed.gov/docs/CampusAttacks_201004.pdf).

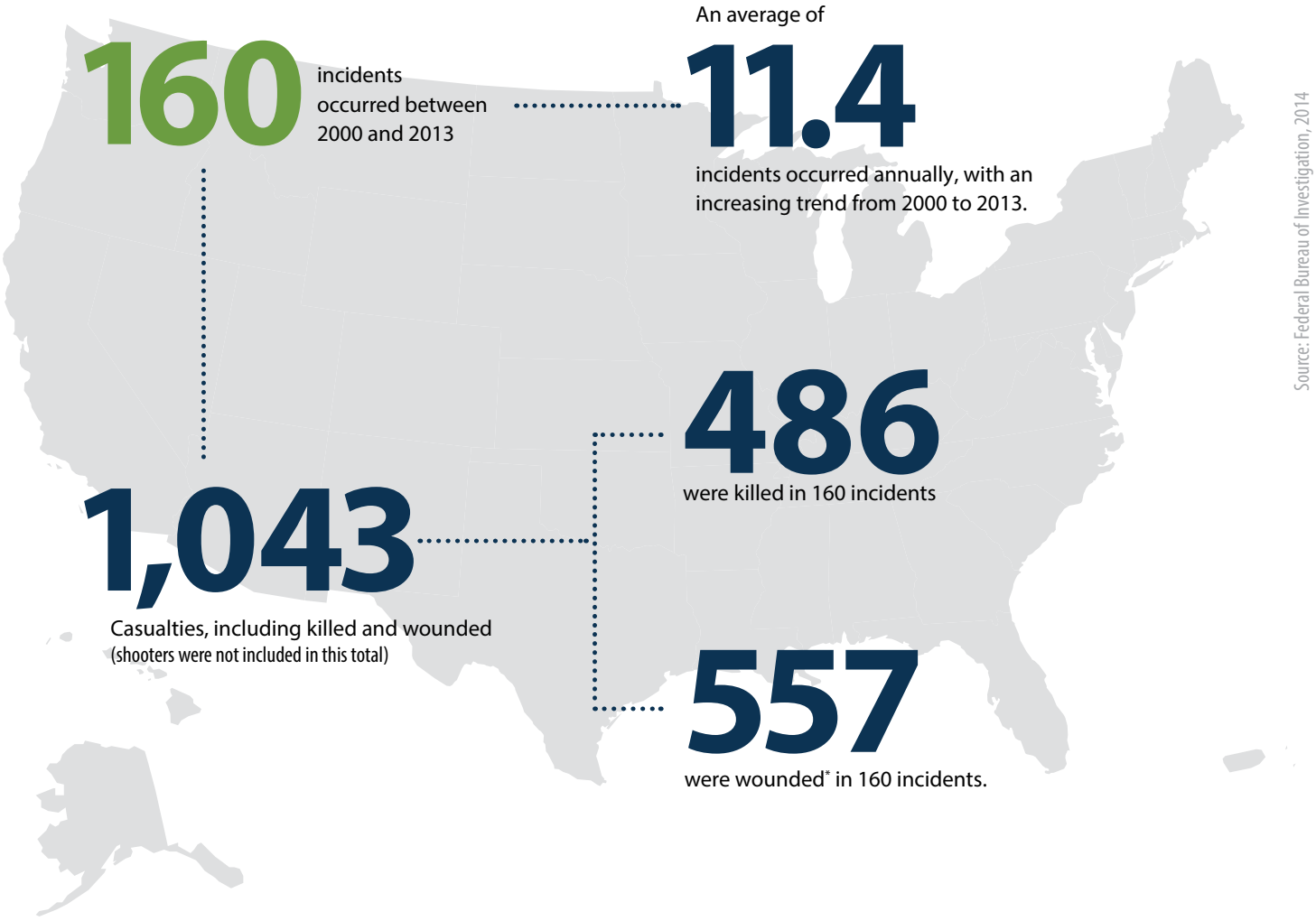
7 Limited details on the shooters are included in this study. In 2015, the FBI Behavioral Threat Assessment Center will research shooter pre-attack behavioral indicators with a focus on findings that will enhance prevention methods.

8 See Appendix A for a summary of incidents examined in this study.

9 Researchers relied on 104 police department records, after action reports, shooting commission reports, open sources, and FBI resources.

Snapshot

The following characteristics of the 160 active shooter incidents identified between 2000 and 2013 are noted:



Source: Federal Bureau of Investigation, 2014

INCIDENTS

- An average of 11.4 incidents occurred annually.
- An average of 6.4 incidents occurred in the first 7 years studied, and an average of 16.4 occurred in the last 7 years.
- 70.0% of the incidents occurred in either a commerce/business or educational environment.[10]
- Shootings occurred in 40 of 50 states and the District of Columbia.
- 60.0% of the incidents ended before police arrived.

*A handful of those identified as "wounded" were not injured by gunfire but rather suffered injuries incidental to the event, such as being hit by flying objects/shattered glass or falling while running. This does not account for all those wounded in this fashion or any mental or emotional trauma that resulted in potential medical treatment.

10 All percentages are rounded to the nearest tenth

CASUALTIES

- Casualties (victims killed and wounded) totaled 1,043. The individual shooters are not included in this total.
- A total of 486 individuals were killed.
- A total of 557 individuals were wounded.[11]
- In 64 incidents (40.0%), the crime would have fallen within the federal definition of "mass killing"—defined as "three or more" killed—under the new federal statute.

INCIDENTS WITH THE HIGHEST CASUALTY COUNTS:

- Cinemark Century 16 Theater in Aurora, Colorado:
  70 (12 killed, 58 wounded), July 20, 2012.
- Virginia Polytechnic Institute and State University in Blacksburg, Virginia:
  49 (32 killed, 17 wounded), April 16, 2007.[12]
- Ft. Hood Soldier Readiness Processing Center in Ft. Hood, Texas:
  45 (13 killed, 32 wounded), November 5, 2009.
- Sandy Hook Elementary School and a residence in Newtown, Connecticut:
  29 (27 killed, 2 wounded), December 14, 2012.

SHOOTERS

- All but 2 incidents involved a single shooter.[13]
- In at least 9 incidents, the shooter first shot and killed a family member(s) in a residence before moving to a more public location to continue shooting.[14]
- In at least 6 incidents, the shooters were female.[15]
- In 64 incidents (40.0%), the shooters committed suicide; 54 shooters did so at the scene of the crime.
- At least 5 shooters from 4 incidents remain at large.[16]

11 A handful of those counted as wounded were not injured by gunfire but rather suffered injuries incidental to the event, such as being hit by flying objects/shattered glass, or falling while running. These were included in the casualty count when research may not have easily allowed for the type of injury to be discerned. This does not account for all those wounded in this fashion, to include those suffering any mental or emotional trauma that resulted in potential medical treatment.

12 Six additional students were injured after they climbed out of a second floor window in Norris Hall but are not included in the study's tally of those wounded because they could be easily discerned from those wounded by the shooter.

13 House Party in South Jamaica, New York, August 27, 2011; Streets of Tulsa, Oklahoma, April 6, 2012. (See Appendix A).

14 Amko Trading Store, January 9, 2001; Red Lake High School, March 21, 2005; Orange High School and Residence, August 30 2006; Residence, Latah County Courthouse, and First Presbyterian Church, May 19, 2007; Coffee and Geneva Counties, Alabama, March 10, 2009; Gainesville, Florida, October 4, 2010; Sandy Hook Elementary School and Residence, December 14, 2012; Jacksonville, North Carolina, and Brady, Texas, May 26, 2013; Santa Monica College and Residence, June 7, 2013.

15 Laidlaw Transit Services Maintenance Yard, April 23, 2001; Santa Barbara U.S. Postal Processing and Distribution Center, January 30, 2006; Louisiana Technical College, February 8, 2008; Shelby Center, University of Alabama, February 12, 2010; Publix Super Market, March 30, 2010; Kraft Foods Factory, September 9, 2010.

16 Burger King and Huddle House, November 22, 2005; Club LT Tranz, July 25, 2009; Washington, D.C. Department of Public Works, October 13, 2010; House Party in South Jamaica, New York, August 27, 2011.

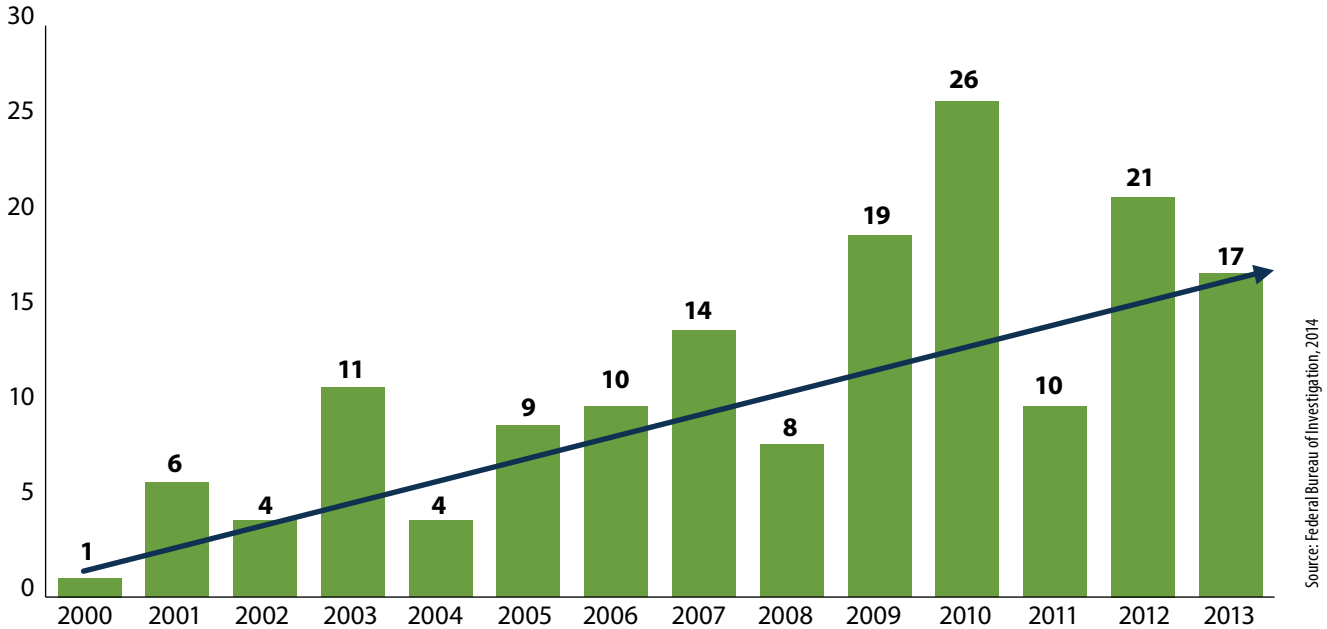
Findings

In this study, the FBI identified 160 active shooter incidents, noting they occurred in small and large towns, in urban and rural areas, and in 40 of 50 states and the District of Columbia. Though incidents occurred primarily in commerce and educational environments (70.0%), they also occurred on city streets, on military and other government properties, and in private residences, health care facilities, and houses of worship. The shooters victimized young and old, male and female, family members, and people of all races, cultures, and religions.

The findings establish an increasing frequency of incidents annually. During the first 7 years included in the study, an average of 6.4 incidents occurred annually. In the last 7 years of the study, that average increased to 16.4 incidents annually. This trend reinforces the need to remain vigilant regarding prevention efforts and for law enforcement to aggressively train to better respond to—and help communities recover from—active shooter incidents.

The findings also reflect the damage that can occur in a matter of minutes. In 64 incidents where the duration of the incident could be ascertained, 44 (69.0%) of 64 incidents ended in 5 minutes or less, with 23 ending in 2 minutes or less. Even when law enforcement was present or able to respond within minutes, civilians often had to make life and death decisions, and, therefore, should be engaged in training and discussions on decisions they may face.[17]

A Study of 160 Active Shooter Incidents in the United States Between 2000 - 2013:
Incidents Annually



17 In 6 incidents (and, in addition, at least 4 schools), officers were on the scene when the shooting began.

As expected, therefore, many incidents ended before police arrived.[18] Of the 160 incidents, at least 107 (66.9%) ended before police arrived and could engage the shooter, either because a citizen intervened, the shooter fled, or the shooter committed suicide or was killed by someone at the scene.

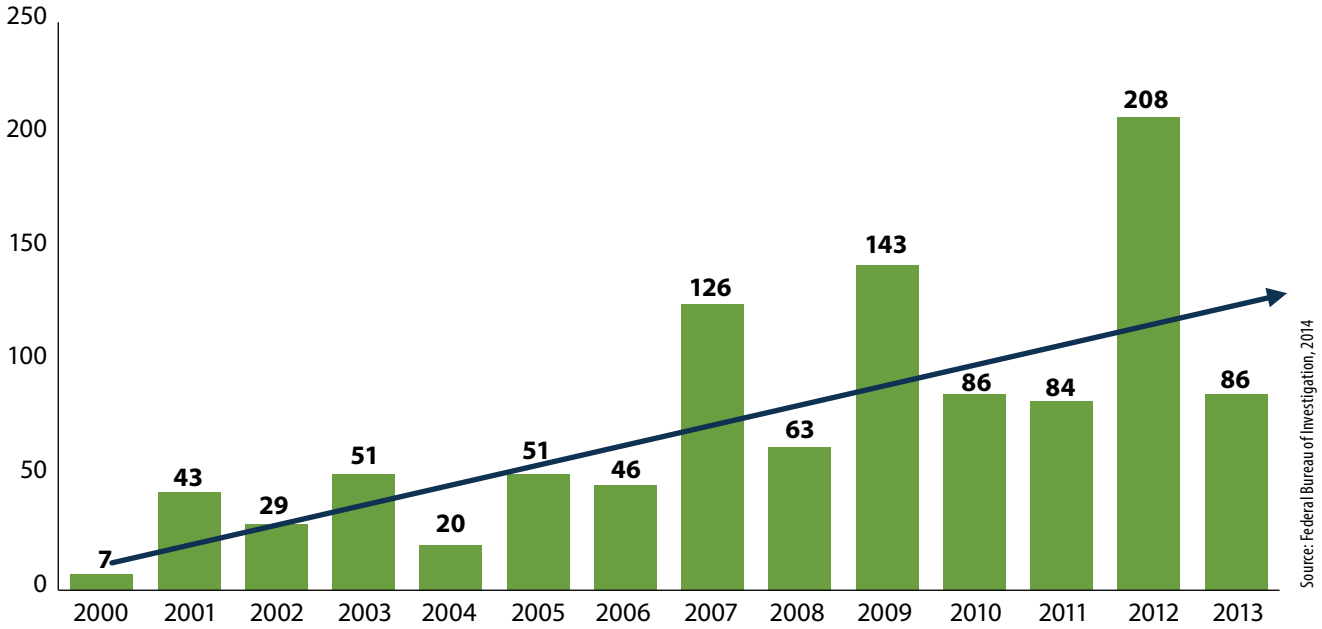
Casualties

A total of 1,043 casualties occurred during the incidents included in this study (486 killed, 557 wounded). If a shooter died as a result of the incident, that individual was not included in the casualty totals. In addition, a small number of those identified as wounded were not injured by gunfire but rather suffered injuries incidental to the event, such as being hit by flying objects/shattered glass or falling while running. For the purposes of this study, the FBI did not seek to isolate the exact number of individuals that fell into this category, when research did not allow for that type of injury to be easily discerned.

The median number of individuals killed in each incident was 2, and the median number of individuals wounded in each incident was 2.

The FBI found that 64 incidents (40.0%) would have been categorized as falling within the new federal definition of "mass killing," which is defined as "three or more killings in a single incident."[19]

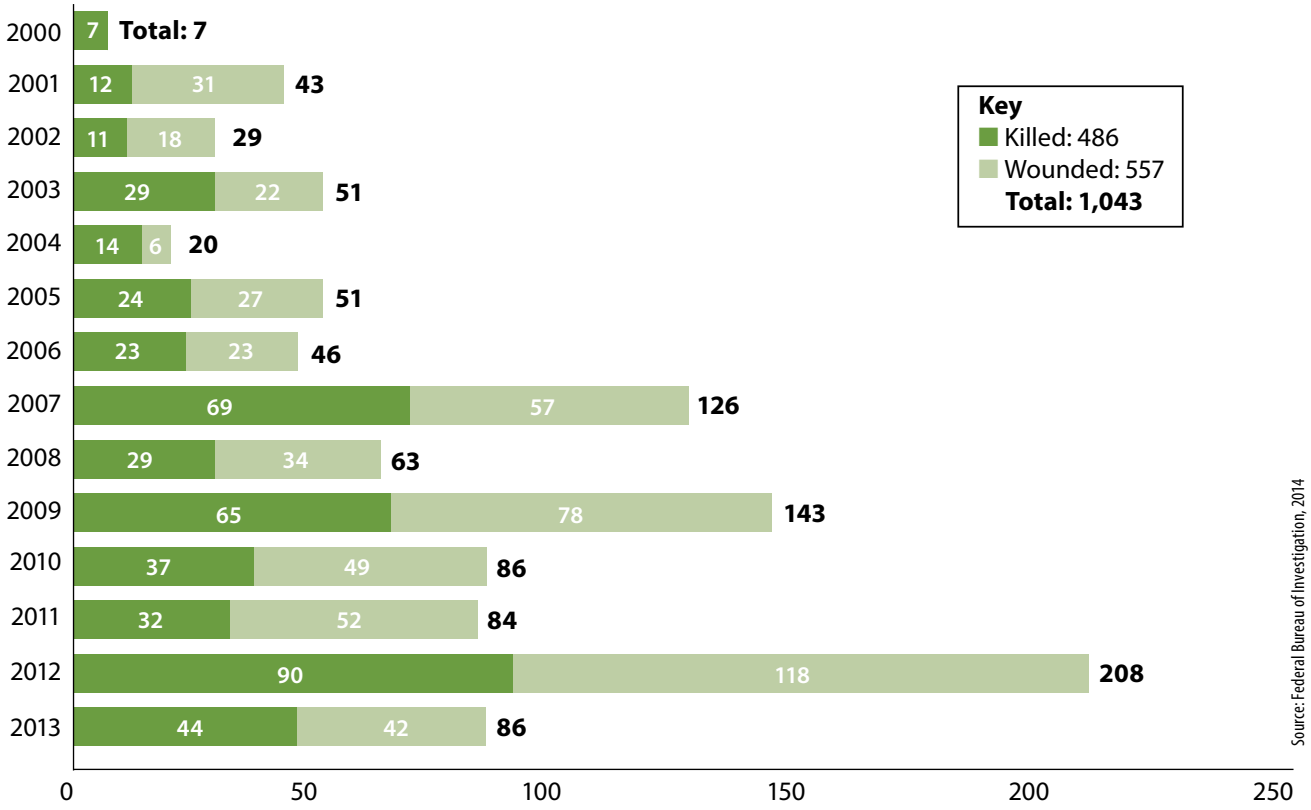
A Study of 160 Active Shooter Incidents in the United States Between 2000 - 2013:
Annual Totals of 1,043 Casualties



18 According to the 2007 National Crime Victimization Survey, 53.4% of the time, law enforcement was able to respond to a reported violent crime in less than 10 minutes. Bureau of Justice, National Crime Victimization Survey, Criminal Victimization in the United States, 2007 Statistical Tables, February 2010.

19 Investigative Assistance for Violent Crimes Act of 2012, 28 USC 530C(b)(1)(M)(i).

A Study of 160 Active Shooter Incidents in the United States Between 2000 - 2013: **Broken Down by Casualty Type; Killed or Wounded**



At least 25 (15.6%) of the 160 incidents involved shootings at more than one location. Several casualties involved family members or individuals who had a close personal relationship with the shooter. In at least 15 (9.4%) of the 160 incidents, the shooters targeted family members, resulting in the deaths of 20 and the wounding of 1.[20] In 9 of these incidents, or about half, the shooters then moved on to another location and continued shooting.

Of note, male shooters also acted violently against women with whom they had or once had a romantic relationship. In 16 (10.0%) of the 160 incidents, the shooters targeted current, estranged, or former wives as well as current or former girlfriends. In 12 incidents, the women were killed;[21] in 3 incidents, the women sustained significant injuries but survived;[22] and in 1 incident, the shooter could not find the woman.[23] While perpetrating this violence, an additional 42 people were killed and another 28 were wounded.

20 Amko Trading Store, January 9, 2001; Gold Leaf Nurseries, July 28, 2003; Red Lake High School, March 21, 2005; Orange High School and Residence, August 30 2006; Residence, Latah County Courthouse, and First Presbyterian Church, May 19, 2007; Coffee and Geneva Counties, Alabama, March 10, 2009; Family Dental Care, July 1, 2009; Legacy Metrolab, November 10, 2009; Residence in Brooksville, Florida, January 14, 2010; Yoyito Café, June 6, 2010; Gainesville, Florida, October 4, 2010; Azana Day Salon, October 21, 2012: Sandy Hook Elementary School and Residence, December 14, 2012; Jacksonville, North Carolina, and Brady, Texas, May 26, 2013; Santa Monica College and Residence, June 7, 2013. (See Appendix A).

21 Amko Trading Store, January 9, 2001; Gold Leaf Nurseries, July 28, 2003; Parking Lots in Philadelphia, Pennsylvania, October 7, 2005; Residence, Latah County Courthouse, and First Presbyterian Church, May 19, 2007; Residence in Crandon, Wisconsin, October 7, 2007; Family Dental Care, July 1, 2009; Legacy Metrolab, November 10, 2009; Yoyito Café, June 6, 2010; Salon Meritage, October 12, 2011; Azana Day Salon, October 21, 2012; Pinewood Village Apartments, April 21, 2013; Jacksonville, North Carolina, and Brady, Texas, May 26, 2013.

22 Emcore Corporation, July 12, 2010; Copley Township Neighborhood, Ohio, August 7, 2011; Las Dominicanas M&M Hair Salon, October 18, 2012.

23 Essex Elementary School, August 24, 2006.

Resolutions

The majority of the 160 incidents (90 [56.3%]) ended on the shooter's initiative—sometimes when the shooter committed suicide or stopped shooting, and other times when the shooter fled the scene.

There were at least 25 incidents where the shooter fled the scene before police arrived. In 4 additional incidents, at least 5 shooters fled the scene and were still at large at the time the study results were released.

In other incidents, it was a combination of actions by citizens and/or law enforcement that ended the shootings. In at least 65 (40.6%) of the 160 incidents, citizen engagement or the shooter committing suicide ended the shooting at the scene before law enforcement arrived. Of those:

- In 37 incidents (23.1%), the shooter committed suicide at the scene before police arrived.
- In 21 incidents (13.1%), the situation ended after unarmed citizens safely and successfully restrained the shooter. In 2 of those incidents,[24] 3 off-duty law enforcement officers were present and assisted.
  - Of note, 11 of the incidents involved unarmed principals, teachers, other school staff and students who confronted shooters to end the threat (9 of those shooters were students).
- In 5 incidents (3.1%), the shooting ended after armed individuals who were not law enforcement personnel exchanged gunfire with the shooters. In these incidents, 3 shooters were killed, 1 was wounded, and 1 committed suicide.
  - The individuals involved in these shootings included a citizen with a valid firearms permit and armed security guards at a church, an airline counter, a federally managed museum, and a school board meeting.[25]
- In 2 incidents (1.3%), 2 armed, off-duty police officers engaged the shooters, resulting in the death of the shooters. In 1 of those incidents, the off-duty officer assisted a responding officer to end the threat.[26]

In 6 instances the shooter was female; all others were male.

Even when law enforcement arrived quickly, many times the shooter still chose to end his life. In 17 (10.6%) of the 160 incidents, the shooter committed suicide at the scene after law enforcement arrived but before officers could act.

In 45 (28.1%) of the 160 incidents, law enforcement and the shooter exchanged gunfire. Of those 45 incidents, the shooter was killed at the scene in 21, killed at another location in 4, wounded in 9, committed suicide in 9, and surrendered in 2.

24 Santana High School, March 5, 2001; Appalachian School of Law, January 16, 2002. (See Appendix A).

25 Player's Bar and Grill, May 25, 2008; Tom Bradley International Terminal at Los Angeles International Airport, July 4, 2002; Youth with a Mission Training Center/New Life Church, December 9, 2007; United States Holocaust Memorial Museum, June 10, 2009; Panama City School Board Meeting, December 14, 2010, Shooter wounded.

26 AT&T Wireless, May 27, 2010; Trolley Square Mall, February 12, 2007.

Law Enforcement/Security Personnel Casualties

Law enforcement suffered casualties in 21 (46.7%) of the 45 incidents where they engaged the shooter to end the threat. This resulted in 9 officers killed (4 of whom were ambushed in a shooting) and 28 wounded.

In 3 (1.9%) of the 160 incidents, armed, non-sworn security personnel were killed.[27] In 2 additional incidents, 2 unarmed security officers were killed and 2 were wounded.[28]

Shooter Outcomes

In all, 64 (40.0%) of the shooters ultimately committed suicide. Most shooters were males acting alone. Only 2 (1.3%) of the 160 incidents had more than 1 shooter and only 6 (3.8%) involved a female shooter. Of note, 2 of the 12 shootings at institutions of higher education (IHEs) were perpetrated by females. At least 5 shooters were at large at the time of the publication of this study.

Results showed 3 shooters carried improvised explosive devices (IEDs); 1 shooter used the device (a Molotov cocktail).[29] And, 1 shooter booby-trapped his residence with IEDs.[30] At least 6 shooters wore or were carrying body armor.

21

of the 45 incidents (46.7%) required law enforcement to engage the shooter, resulting in 9 officers killed and 28 wounded.

Locations

The FBI identified 11 separate incident location categories[31] when seeking to identify the primary locations where the public was most at risk during an incident. These location categories include commercial areas (divided into malls, businesses open to pedestrian traffic, and businesses closed to pedestrian traffic), educational environments (divided into schools [pre-kindergarten through 12th grade] and IHEs), open spaces, government properties (divided into military and other government properties), residences, houses of worship, and health care facilities.

When an incident occurred in two or more locations, the FBI sought to identify where the public was most at risk. For example, in instances where casualties occurred inside a private residence before a shooter moved to a public area, those incidents were categorized at the location where the public was more at risk. In addition, some specialized business locations (i.e., malls and health care facilities) were identified separately to provide added transparency.

In all, 24 (15.0%) of the 160 incidents involved shootings at more than one location. This supports the value in quickly assessing the circumstances where the first shooting occurs and may aid law enforcement's ability to predict other potential targets.

27 United States Holocaust Memorial Museum, June 10, 2009; Lloyd D. George U.S. Courthouse and Federal Building, January 4, 2010; Washington Navy Yard Building 197, September 16, 2013 . (See Appendix A).

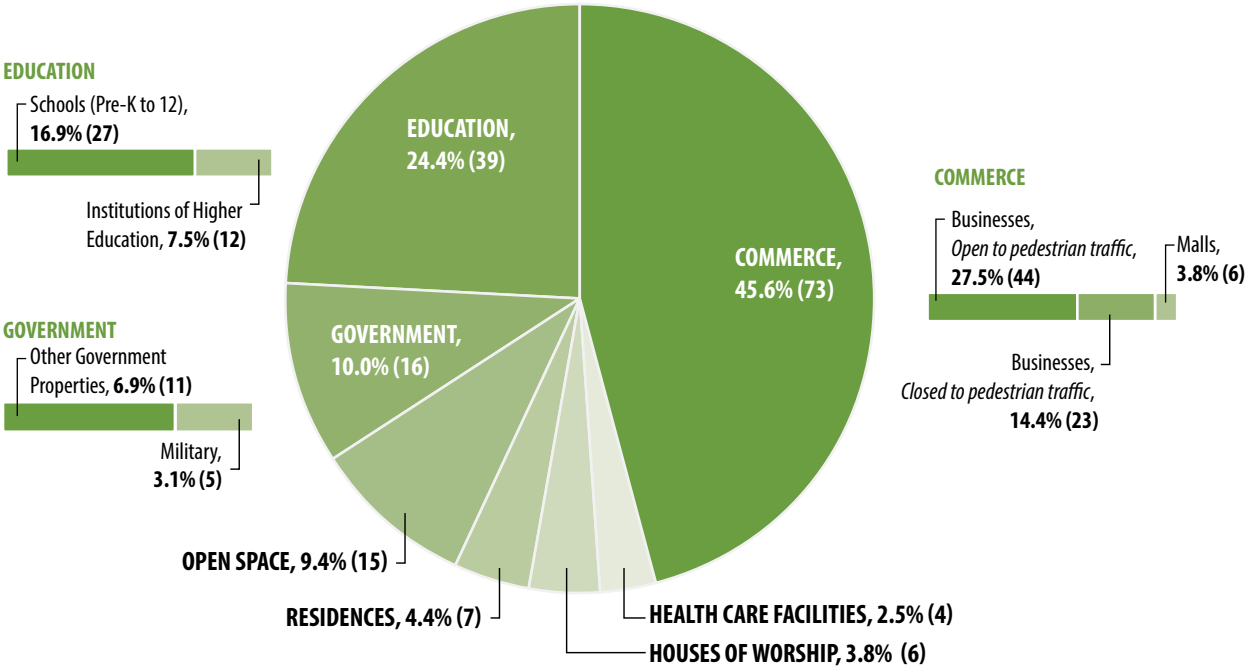
28 Red Lake High School, March 21, 2005; Los Angeles International Airport, November 1, 2013.

29 Arapahoe High School, December 13, 2013.

30 Cinemark Century 16, Aurora, Colorado, July 20, 2012.

31 See Appendix C for a summary of location definitions.

A Study of 160 Active Shooter Incidents in the United States Between 2000 - 2013: **Location Categories**



The study results identified 73 (45.6%) of 160 incidents that occurred in areas of commerce. These included businesses open to pedestrian traffic (44 [27.5%]), businesses closed to pedestrian traffic (23 [14.3%]), and malls (6 [3.8%]). These distinctions were made in order to determine whether the public was more at risk in areas where pedestrian traffic was likely.

Educational environments were identified as the second-largest location grouping (39 [24.4%]). These were further broken down as those occurring in schools (27 [16.9%], including two school board meetings) and IHEs (12 [7.5%]).

Other incidents, in descending order, were located in:

- Open spaces (15 [9.4%]);
- Government properties (16 [10.0%]);
  - Other (non-military) government properties (11 [6.9%])
  - Military properties (5 [3.1%])
- Residences (7 [4.4%]);
- Houses of worship (6 [3.8%]); and
- Health care facilities (4 [2.5%]).

Breakdown by location:

COMMERCE AREAS

Businesses Open to Pedestrian Traffic

The 44 incidents that occurred in business environments generally open to pedestrian traffic resulted in 124 people killed (including 2 company co-owners in 1 incident) and 181 people wounded (including 1 manager). The most incidents occurred on Tuesdays (10), with others occurring on Fridays (9), Mondays (6), Wednesdays (6), Thursdays (5), Sundays (5), and Saturdays (3).

The majority of the shooters in these incidents were not employed at the location. Specifically:

- 30 shooters (68.2%) were not employed by the businesses, though 7 had a relationship with at least 1 current employee;
- 12 shooters (27.3%), including 1 woman, were employed or previously employed by the businesses (8 current employees [2 possibly facing termination, 1 terminated the day of the shooting] and 4 former employees); and
- 2 or more shooters from 2 incidents fled the scene and remain at large, so their connection to the incident location is unknown.

These incidents ended when:

- 19 shooters committed suicide (11 did so at the scene before police arrived, 3 did so at the scene after police arrived, and 5 shooters fled the scene and committed suicide at another location);
- 9 shooters were apprehended at the scene (1 after being restrained by a citizen);
- 8 shooters fled and were apprehended by law enforcement at another location;
- 4 shooters were killed by law enforcement (2 at the scene);
- 2 shooters fled and were not apprehended;
- 1 shooter was killed by an off-duty law enforcement officer at the scene; and
- 1 shooter was killed at the scene by a citizen with a valid firearms permit.

73

of the 160 incidents, occurred in an environment related to commerce.

Businesses Closed to Pedestrian Traffic

The 23 incidents that occurred in business environments generally closed to pedestrian traffic resulted in 69 individuals killed and 73 wounded. In 12 incidents, supervisors/managers and owners of companies were killed (10) or wounded (5). The most incidents occurred on Wednesdays (7), with others occurring on Tuesdays (5), Thursdays (4), Mondays (3), Fridays (2), and a Sunday (1).

These incidents almost exclusively involved employees. In all, 22 of the 23 shooters, including 2 females, were employed or previously employed at the business. The sole shooter not employed by a business had a relationship with a current employee. The 22 shooters who were employees included:

- 14 current employees;
- 4 employees fired the day of the shooting;
- 3 former employees; and
- 1 suspended employee.

These incidents ended when:

- 16 shooters committed suicide (13 did so at the scene before police arrived, 1 did so at the scene after police arrived, and 2 shooters fled the scene and committed suicide at another location);
- 3 shooters were apprehended at the scene (2 after being restrained by citizens);
- 3 shooters were killed by police (2 at the scene and 1 elsewhere); and
- 1 shooter fled and was apprehended by police at another location.

Malls

The 6 incidents that occurred in malls resulted in 17 killed and 18 wounded. It appeared the shooters were neither employed by businesses in the affected malls nor had relationships with mall employees. The most incidents occurred on Sundays (2), with others occurring on a Monday (1), a Tuesday (1), and Wednesday (1), and a Thursday (1).

These incidents ended when:

- 3 shooters committed suicide at the scene before law enforcement arrived;
- 2 shooters were apprehended by law enforcement at the scene (1 after being restrained by a citizen); and
- 1 shooter was killed by law enforcement during an exchange of gunfire with responding officers, including an off-duty officer at the mall at the time.

Incidents in educational facilities account for some of the higher casualty counts.

EDUCATION ENVIRONMENTS

The 39 incidents that occurred in educational environments (27 schools, 12 IHEs) resulted in 117 individuals killed and 120 wounded. Note that in this study, schools are defined as pre-kindergarten through 12th grade (PreK-12) educational facilities; incidents that occurred at school-related facilities such as school administration buildings are also included in this category.

Incidents in educational facilities account for some of the higher casualty counts. For example, the highest death tolls among the 160 incidents occurred at Virginia Polytechnic Institute and State University in Blacksburg, Virginia (32 killed, 17 wounded) and Sandy Hook Elementary School in Newtown, Connecticut (26 killed, 2 wounded [1 additional death at a residence]). Other high casualty counts occurred during the shootings at Northern Illinois University in DeKalb, Illinois (5 killed, 16 wounded) and Santana High School in Santee, California (2 killed, 13 wounded).

No law enforcement officers were killed or wounded in school incidents, and no officers were killed in incidents at IHEs. One officer was wounded in 1 incident at an IHE, however, it occurred at a medical facility on the campus and not in a campus residence or classroom.

IHEs

The 12 IHE shootings resulted in 60 individuals killed and 60 individuals wounded. The shooters, 2 of whom were female, ranged in age from 18 to 62. The shooters included 5 former students, 4 current students, 2 employees, and 1 patient visiting a medical center. The most incidents occurred on Fridays (5) with others occurring on Mondays (2), Thursdays (2), a Sunday (1), a Tuesday (1), and a Wednesday (1).

These incidents ended when:

- 5 shooters were apprehended by police at the scene (1 after 2 off-duty officers and a citizen restrained him, and 1 after a being restrained by an off-duty mall security officer);
- 4 shooters committed suicide at the scene (3 before police arrived, 1 after);
- 2 shooters were killed by police at the scene; and
- 1 shooter fled the scene and was apprehended by police at another location.

Schools

The 27 school incidents resulted in 57 individuals killed and 60 individuals wounded. In 2 of the incidents, an adult fired on school board members during a board meeting. Of the remaining 25 incidents, 14 occurred in a high school (HS), 6 occurred in a middle school or junior high school (MS), 4 occurred in an elementary school (ES), and 1 occurred at a school including grades PreK-12.

64

of the shooters ultimately committed suicide.

Where shootings occurred inside buildings, 14 (51.9%) took place in school classrooms and hallways (9 HS, 3 MS, 1 ES, 1 PreK-12), 3 in the school cafeteria (2 HS, 1 MS), 2 in school administrative offices, 2 in school board meeting rooms, and 2 in the school when no classes were in session. An additional 4 incidents were initiated outside (1 HS, 2 MS, 1 ES), including 2 where the shooters were in vehicles.

In addition to the many student victims, the casualties included school employees, resulting in at least 14 killed (6 teachers, 5 five principals or assistant principals, and 3 other staff members) and another 16 wounded (9 teachers, 5 administrators, and 2 staff members).

In a majority of HS and MS incidents, the shooter was a student at the school; this was the case in 12 of 14 HS shootings and 5 of 6 MS shootings. Incidents at elementary schools did not involve the actions of a student.

School Board Meetings

The 2 incidents at school board meetings resulted in 1 individual wounded. The shooters were 56- and 58-year-old males. One shooter committed suicide after an exchange of gunfire with the school district's armed security guard, and the other shooter was arrested by police after other school administrators wrestled him to the ground.

High Schools

The 14 HS incidents resulted in 21 killed (including 5 school employees) and 40 wounded (including 11 school employees). The shooters ages ranged from 14 to 19. All but 2 shooters were current students at the affected school; one was a former student and the other was a high school student at another school. The most incidents occurred on Mondays (5), followed by Wednesdays (4), Thursdays (2), Fridays (2), and a Tuesday (1).

These incidents ended when:

- 10 shooters were apprehended at the scene (2 by responding police officers, 7 after being initially restrained by school employees [including 1 incident where students assisted], and 1 by an off-duty police officer);
- 3 shooters committed suicide at the scene (1 before police arrived, 2 after); and
- 1 shooter fled and committed suicide at another location.

Middle Schools

The 6 MS incidents resulted in 2 killed (2 school employees) and 6 wounded. The 5 MS shooters, who were students at the affected school, ranged in age from 12 to 15; the other shooter was 32. The incidents occurred on Mondays (3), Tuesdays (2) and a Thursday (1).

In all but 2 of the 160 incidents, the shooters chose to act alone.

These incidents ended when:

- 3 shooters were apprehended by police after being restrained by school employees;
- 2 shooters committed suicide at the scene before police arrived; and
- 1 shooter was apprehended by police at the scene.

Elementary Schools

The 4 ES incidents resulted in 29 killed (7 school employees) and 8 wounded (5 school employees). The shooters ranged in age from 20 to 48. None of the shooters worked at the schools, though 1 was a former teacher and 1 had a relationship with an individual at 1 of the schools. The shootings occurred on Fridays (2), a Wednesday (1), and a Thursday (1).

These incidents ended when:

- 3 shooters were apprehended at the scene (1 after being restrained by citizens); and
- 1 shooter committed suicide at the scene after police arrived.

Pre-K Through 12th Grade School

A single incident occurred at a PreK-12 school resulting in 5 killed and 5 wounded. The incident, which occurred on a Monday, involved a 32-year-old shooter who committed suicide while law enforcement was on the scene.

OPEN SPACES

The 15 incidents that occurred in open spaces resulted in 45 people killed, including 1 law enforcement officer, and 54 people wounded (including 10 law enforcement officers). The shooters ranged in age from 17 to 72. Only 1 incident had 2 shooters. Most incidents occurred on Fridays (6) with the rest occurring on Saturdays (3), Sundays (3), Tuesdays (2), and a Monday (1). In all, 4 shooters committed suicide (2 at the scene and 2 at another location). Police killed 4 shooters (3 at the scene and 1 at another location) and apprehended 7 shooters (4 at another location, 2 at the scene, and 1 after the shooter was restrained by a citizen). In the 15 incidents, 11 of the shooters were in vehicles during a portion of the incident.

MILITARY AND OTHER GOVERNMENT PROPERTIES

The 11 incidents that occurred on non-military government properties resulted in 24 killed (including 3 law enforcement officers) and 14 wounded (including 4 law enforcement officers). The ages of the shooters, 1 of whom was female, ranged from 23 to 88. One unknown shooter remains at large. Most incidents occurred on Mondays (3) and Wednesdays (3) with the rest occurring on Thursdays (2), a Tuesday (1), a Friday (1), and a Saturday (1). In all, 4 shooters were killed by police at the scene, 1 shooter was killed by an airport security guard, 3 shooters were apprehended by police at the scene (1 after the shooter was restrained by a citizen), 2 shooters committed suicide at the scene (1 before and 1 after police arrived), and 1 shooter fled and is still at large.

21

incidents (13.1%), ended after unarmed citizens safely and successfully restrained the shooter.

June 10, 2009, United States Holocaust Memorial Museum

Photo: Washington Field Office photographer Jennifer Hill

The 5 incidents that occurred on military property resulted in 27 killed and 43 wounded (including 5 law enforcement officers). The shooters ranged in age from 23 to 63. Most incidents occurred on Mondays (3) with the rest occurring on Thursdays (2). In all, police killed 3 shooters at the scene and apprehended 2 shooters at the scene. Two shooters had prior military service, 2 shooters had no military experience, and 1 shooter was an active duty member of the military.

RESIDENCES

The 7 incidents that occurred solely at a residence resulted in 32 people killed (including 1 law enforcement officer) and 17 wounded. The ages of the shooters ranged from 20 to 55, excluding 2 additional unidentified shooters who remain at large. Most incidents occurred on Sundays (3) and Saturdays (2), with the rest occurring on a Thursday (1) and a Friday (1). In all, 3 shooters were killed by police, 2 committed suicide after police arrived, and 2 were apprehended. One incident involved 3 shooters, and 2 of those shooters remain at large.[32]

In 9 incidents, the shooter first shot and killed family members in a residence before moving to a more public location to continue shooting.

HOUSES OF WORSHIP

The 6 incidents in houses of worship resulted in 21 people killed and 27 wounded (including 1 law enforcement officer). The ages of the shooters ranged from 24 to 69. Most incidents occurred on Sundays (3), with the rest occurring on a Tuesday (1), a Friday (1), and a Saturday (1). In all, 3 shooters were apprehended (2 of whom were restrained by citizens until police arrived) and 3 committed suicide at the scene (2 before police arrived and 1 after).

HEALTH CARE FACILITIES

The 4 incidents in health care facilities resulted in 10 killed and 10 wounded (including 2 law enforcement officers). The ages of the shooters ranged from 38 to 51. All incidents occurred on different days of the week: a Monday (1), a Tuesday (1), a Saturday (1), and a Sunday (1). In all, 2 shooters committed suicide at the scene (1 before police arrived, and 1 after), 1 was apprehended at the scene, and 1 was killed by police at the scene.

32 An additional 7 shootings took place at a residence before the shooter moved on to another more public location. In those instances, a shooter killed a close friend or family member before driving to the location where the majority of the casualties occurred. These incidents, therefore, were coded as having occurred within the other locations (e.g. businesses open to pedestrian traffic, schools, houses of worship).

Conclusion

The FBI initiated this study to add to the resources available to law enforcement and others who must consider their best course of action to prepare for, respond to, and recover from active shooter incidents. Using the same criteria over a 14-year span, the FBI sought to determine whether the number of active shooter incidents had changed, concluding the trend over the study period showed a steady rise. In the first half of the years studied, the average annual number of incidents was 6.4, but that average rose in the second half of the study to 16.4, an average of more than one incident per month.

Of the 160 incidents studied, 64 (40.0%) would have met the criteria to fall under the federal statute passed in 2012 which defines mass killing as three or more killed in a single incident. Of the 64, 39 of these mass killings occurred within the final 7 years studied.

Study results also indicate that, of the 11 defined location categories, the majority of incidents—45.6% of the 160—occurred in an environment related to commerce. The second most common incident locations were in educational environments (24.4%), and the study results established that some of these incidents involved some of the highest casualty numbers.

Study results provided added clarity on instances where law enforcement appeared to be most at risk when responding to the scene. For example, though law enforcement responded to a large number of school incidents, no law enforcement officers were killed or wounded when responding to a school incident. However, in 45 of the 160 incidents where law enforcement did engage a shooter, law enforcement suffered casualties in 21 (46.7%) of the incidents, resulting in 9 officers killed and 28 wounded.

Significantly, 10 of the officers were wounded in gunfights categorized as occurring in open spaces where the shooters were moving through streets and between buildings. In addition, 3 of the officers were wounded on military property, and another 3 were killed and 9 wounded in gunfights on other government properties. Based on these study results, therefore, the FBI will no longer use the term “confined” as part of the “active shooter” definition.

Though this study did not focus on the motivation of the shooters, the study did identify some shooter characteristics. In all but 2 of the incidents, the shooter chose to act alone. Only 6 female shooters were identified. Shooter ages as a whole showed no pattern. However, some patterns were seen in incident sub-groups. For example, 12 of 14 shooters in high school shootings were students at the schools, and 5 of the 6 shooters at middle schools were students at the schools.

In addition, research results identified some location categories where victim targets were more readily identifiable, in part because of the shooters’ connections to the locations. For example, in businesses generally closed to pedestrian traffic, 22 of the 23 shooters were employees or former employees of the involved company. In other instances, the location category appeared less significant than the victims targeted. For example, in 15 (9.3%) of the 160 incidents, the shooter targeted family members. And in 15 (9.3%) of the 160 incidents, the shooter targeted his current, estranged, or former spouse or his current or former girlfriend.

This study helps clarify the environment with regard to both the level of risk citizens face and the speed with which active shooter incidents occur. A majority of the 160 incidents (90 [56.3%]) ended on the shooter's initiative before the police arrived—sometimes when the shooter committed suicide or stopped shooting, and other times when the shooter fled the scene. In 64 incidents where the duration of the incident could be ascertained, 44 (69.0%) of 64 incidents ended in 5 minutes or less, with 23 ending in 2 minutes or less.

The study identified 21 (13.1%) of 160 incidents where unarmed citizens made the selfless and deeply personal choices to face the danger of an active shooter. In those instances, the citizens safely and successfully disrupted the shootings. In 11 of those 21 incidents, unarmed principals, teachers, other school staff and students confronted the shooters to end the threat. In 10 incidents, citizens, working or shopping when the shootings began, successfully restrained shooters until police could arrive. And in 6 other incidents, armed off-duty police officers, citizens, and security guards risked their lives to successfully end the threat. These actions likely saved the lives of students and others present.

Recognizing the increased active shooter threat and the swiftness with which active shooter incidents unfold, these study results support the importance of training and exercises—not only for law enforcement but also for citizens. It is important, too, that training and exercises include not only an understanding of the threats faced but also the risks and options available in active shooter incidents.

Finally, the FBI recognizes that seeking to avoid these tragedies is clearly the best result. The FBI remains dedicated to supporting prevention efforts within all communities affected by these tragedies. As the FBI continues to study the active shooter phenomenon, the Bureau remains committed to assist state, local, tribal, and campus law enforcement in developing better prevention, response, and recovery practices involving active shooter incidents.

Appendix A:

The following is a list of 160 active shooter incidents that occurred in the United States between 2000 and 2013 and were identified as part of a study conducted in 2014 by the Federal Bureau of Investigation*.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Edgewater Technology, Inc.

On December 26, 2000, at 11:15 a.m., Michael M. McDermott, 42, armed with a rifle, a shotgun, and a handgun, began shooting co-workers in the Edgewater Technology Inc. building in Wakefield, Massachusetts. Seven people were killed; no one was wounded. The shooter was apprehended when police arrived and found him sitting in a conference room.

Amko Trading Store

On January 9, 2001, at 12:00 p.m., Ki Yung Park, 54, fatally shot his estranged wife at a convenience store they owned in Houston, Texas. Armed with two handguns, he then drove to the nearby Amko Trading Store and continued shooting. Four people were killed; no one was wounded. The shooter committed suicide when police arrived after being flagged down by a citizen.

Navistar International Corporation Factory

On February 5, 2001, at 9:40 a.m., William Daniel Baker, 57, armed with two rifles, a handgun, and a shotgun, began shooting co-workers in the Navistar International Corporation factory in Melrose Park, Illinois. He was to have reported to prison the next day for stealing from Navistar. Four people were killed; four were wounded. The shooter committed suicide before police arrived.

Santana High School

On March 5, 2001, at 9:20 a.m., Charles Andrew Williams Jr., 15, armed with a handgun, began shooting in Santana High School in Santee, California. Two people were killed; 13 were wounded. The shooter was apprehended by an off-duty officer who heard gunshots.

Granite Hills High School

On March 22, 2001, at 12:55 p.m., Jason Anthony Hoffman, 18, armed with a shotgun and a handgun, began shooting in Granite Hills High School in El Cajon, California. No one was killed; five were wounded. The shooter was shot by police. He committed suicide in jail one week before sentencing.

Laidlaw Transit Services Maintenance Yard

On April 23, 2001 at 6:00 a.m., Cathline Repunte (female), 36, armed with a handgun, began shooting in the Laidlaw Transit Services maintenance yard in San Jose, California. One person was killed; three were wounded. The shooter was restrained by a co-worker until police arrived and took her into custody.

Nu-Wood Decorative Millwork Plant

On December 6, 2001 at 2:31 p.m., Robert L. Wissman, 36, armed with a shotgun, began shooting in the Nu-Wood Decorative Millwork plant in Goshen, Indiana. He had been fired from his job that morning and returned in the afternoon to begin shooting. One person was killed; six were wounded. The shooter committed suicide before police arrived.

*Some litigation was incomplete at the time of the study's release.

Key
- Commerce
- Education
- Government
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Appalachian School of Law

On January 16, 2002, at 1:15 p.m., Peter Odighizuma, 43, armed with a handgun, began shooting in the Appalachian School of Law located in Grundy, Virginia. Three people were killed; three were wounded. Three students—two of whom were off-duty police officers—tackled and restrained the shooter until police arrived and took him into custody.

Bertrand Products, Inc.

On March 22, 2002, at 8:15 a.m., William Lockey, 54, armed with a rifle and a shotgun, began shooting co-workers in the Bertrand Products, Inc. facility in South Bend, Indiana. As he attempted to flee the scene in a stolen company van, he exchanged gunfire with police, eventually committing suicide. Four people were killed; five were wounded, including three police officers.

Tom Bradley International Terminal at Los Angeles International Airport

On July 4, 2002, at 11:30 a.m., Hesham Mohamed Ali Hadayet, 43 (41, using an alias DOB), entered Los Angeles International Airport (LAX) in Los Angeles, California, armed with two handguns. He began shooting while standing in line at the EL AL Israel Airlines ticket counter in the Tom Bradley International Terminal of LAX. Two people were killed; two were wounded, including one knife injury. An EL AL security official killed the shooter.

18 Miles of U.S. Route 64 from Sallisaw to Roland, Oklahoma

On October 26, 2002, at 5:00 p.m., Daniel Hawke Fears, 18, armed with a shotgun, began shooting from his vehicle at pedestrians and drivers in Sallisaw, Oklahoma, after a pedestrian accused him of reckless driving. He continued to drive and shoot at victims for 90 minutes until he crashed into a police blockade in Roland and was taken into custody. Two people were killed; eight were wounded.

Labor Ready, Inc.

On February 25, 2003, at 6:25 a.m., Emanuel Burl Patterson, 23, armed with a handgun, began shooting in the lobby of Labor Ready Inc., in Huntsville, Alabama, after arguing with others about a CD player. He then fled the scene. Four people were killed; one was wounded. The shooter surrendered after police surrounded his apartment eight hours later.

Red Lion Junior High School

On April 24, 2003, at 7:34 a.m., James Sheets, 14, armed with three handguns, shot and killed the school principal in the cafeteria at Red Lion Junior High School in Red Lion, Pennsylvania. Though others were present at the scene, the shooter committed suicide after killing the principal, before police arrived.

Case Western Reserve University, Weatherhead School of Management

On May 9, 2003, at 3:55 p.m., Biswanath A. Halder, 62, armed with a rifle and a handgun, began shooting in the Weatherhead School of Management building at Case Western Reserve University in Cleveland, Ohio. One person was killed; two were wounded. The shooter was wounded during an exchange of gunfire with police.

Modine Manufacturing Company

On July 1, 2003, at 10:28 p.m., Jonathon W. Russell, 25, armed with a handgun, began shooting co-workers in the Modine Manufacturing Company building in Jefferson City, Missouri. Three people were killed; five were wounded. The shooter fled the premises and then committed suicide during an exchange of gunfire with police.

Key
- Commerce
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- Government
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- Residences
- Health Care
- House of Worship

Lockheed Martin Subassembly Plant

On July 8, 2003, at 9:30 a.m., Douglas Paul Williams, 48, armed with a shotgun and a rifle, began shooting in the Lockheed Martin subassembly plant in Meridian, Mississippi. Six people were killed; eight were wounded. The shooter committed suicide before police arrived.

Kanawha County Board of Education

On July 17, 2003, at 7:00 p.m., Richard Dean Bright, 58, armed with two rifles and two handguns, began shooting during a Kanawha County Board of Education meeting in Charleston, West Virginia. He attempted to light a board member on fire and fired one round at board members before three administrators wrestled the gun away from him. No one was killed; one was wounded.

Gold Leaf Nursery

On July 28, 2003, at 11:40 a.m., Agustin Casarubias-Dominguez, 45, aka Andres Casarrubias, 47, armed with a handgun, began shooting in the Gold Leaf Nursery facility in Boynton Beach, Florida, where his estranged wife and the man he believed to be her boyfriend were employed. Three people, including his estranged wife, were killed; no one was wounded. The shooter was restrained by a citizen while attempting to reload his gun and was taken into custody by police.

Andover Industries

On August 19, 2003, at 8:20 a.m., Richard Wayne Shadle, 32, armed with four handguns, began shooting in the Andover Industries facility in Andover, Ohio, after his boss threatened to fire him. One person was killed; two were wounded. The shooter committed suicide before police arrived.

Windy City Core Supply, Inc.

On August 27, 2003, at 8:30 a.m., Salvador Tapia Solis, 36, armed with a handgun, began shooting in Windy City Core Supply, Inc. in Chicago, Illinois, a business from which he had been fired six months prior. Six people were killed; no one was wounded. After a two-hour standoff, the shooter was killed by police.

Rocori High School

On September 24, 2003, at 11:35 a.m., John Jason McLaughlin, 15, armed with a handgun, began shooting in Rocori High School in Cold Spring, Minnesota. A teacher at the school confronted the shooter and ordered him to place his gun on the ground. The shooter complied. Two people were killed; no one was wounded. Police took the shooter into custody.

Watkins Motor Lines

On November 6, 2003, at 9:57 a.m., Joseph John Eschenbrenner, III (aka Tom West), 50, armed with two handguns, began shooting in the offices of Watkins Motor Lines in West Chester, Ohio. He had been employed by the Atlanta,Georgia, office of Watkins Motor Lines until he resigned in 2001. Two people were killed; three were wounded. The shooter was apprehended by police in Indiana later that day.

Columbia High School

On February 9, 2004, at 10:30 a.m., Jon William Romano, 16, armed with a shotgun, began shooting while entering Columbia High School in East Greenbush, New York. No one was killed; one person was wounded. The shooter was restrained by administrators before police arrived and took him into custody.

Key
- Commerce
- Education
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- Residences
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- House of Worship

ConAgra Plant
On July 2, 2004, at 5:00 p.m., Elijah J. Brown, 21, armed with a handgun, began shooting employees in the ConAgra plant in Kansas City, Kansas. He had been laid off due to a production slowdown but was rehired six weeks prior to the incident. Six people were killed; two were wounded. The shooter committed suicide before police arrived.

Radio Shack in Gateway Mall
On November 18, 2004, at 6:45 p.m., Justin Michael Cudar, 25, armed with a handgun, began shooting in the Radio Shack at the Gateway Mall in St. Petersburg, Florida. Two people were killed; one was wounded. The shooter committed suicide before police arrived.

Private Property near Meteor, Wisconsin
On November 21, 2004, at 12:00 p.m., Chai Soua Vang, 36, armed with a rifle, began shooting at hunters in a wooded area outside of Meteor, Wisconsin, after the hunters found him on their private land. Six people were killed; two were wounded. The shooter was apprehended by police.

DaimlerChrysler's Toledo North Assembly Plant
On January 26, 2005, at 8:34 p.m., Myles Wesley Meyers, 54, armed with a shotgun, returned from his lunch break and began shooting in DaimlerChrysler's Toledo North Assembly plant in Toledo, Ohio. He took a woman hostage before beginning to shoot at his co-workers. One person was killed; two were wounded. The shooter committed suicide before police arrived.

Best Buy in Hudson Valley Mall
On February 13, 2005, at 3:15 p.m., Robert Charles Bonelli Jr., 25, armed with a rifle, began shooting in the Best Buy at the Hudson Valley Mall in Kingston, New York. The shooter continued firing as he ran farther into the mall until he ran out of ammunition. No one was killed; two people were wounded. The shooter was restrained by two mall workers until police arrived and took him into custody.

Living Church of God
On March 12, 2005, at 12:51 p.m., Terry M. Ratzmann, 44, armed with a handgun, began shooting during a Living Church of God service at the Sheraton Hotel in Brookfield, Wisconsin. Seven people were killed; four were wounded. The shooter committed suicide before police arrived.

Red Lake High School and Residence
On March 21, 2005, at 2:49 p.m., Jeffery James Weise, 16, armed with a shotgun and two handguns, began shooting at Red Lake High School in Red Lake, Minnesota. Before the incident at the school, the shooter fatally shot his grandfather, who was a police officer, and another individual at their home. He then took his grandfather's police equipment, including guns and body armor, to the school. A total of nine people were killed, including an unarmed security guard, a teacher, and five students; six students were wounded. The shooter committed suicide during an exchange of gunfire with police.

California Auto Specialist and Apartment Complex
On August 8, 2005, at 2:40 p.m., Louis Mitchell Jr., 35, armed with a handgun, began shooting in the California Auto Specialist facility in Colton, California. The shooter then fled to a nearby apartment complex and continued shooting. Three people were killed; three were wounded. The shooter was wounded by police as he was apprehended the next day.

Key
- Commerce
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- Government
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- Residences
- Health Care
- House of Worship

Parking Lots in Philadelphia, Pennsylvania

On October 7, 2005, at 10:13 a.m., Alexander Elkin, 45, armed with a handgun, shot two people in different parking lots in Philadelphia, Pennsylvania. He shot his ex-wife and then drove with her body in the car to kill her friend at another location. An off-duty police officer witnessed the shooting and flagged down an on-duty police officer to pursue the shooter. After an exchange of gunfire with police, the shooter retreated to his car, where he committed suicide. Two people were killed; no one was wounded.

Campbell County Comprehensive High School

On November 8, 2005, at 2:14 p.m., Kenneth S. Bartley, 14, armed with a handgun, began shooting in Campbell County Comprehensive High School in Jacksboro, Tennessee. Before the shooting, he had been called to the office when administrators received a report that he had a gun. When confronted, he shot and killed an assistant principal and wounded the principal and another assistant principal. The shooter was restrained by students and administrators until police arrived and took him into custody.

Tacoma Mall

On November 20, 2005, at 12:00 p.m., Dominick Sergil Maldonado, 20, armed with a rifle and a handgun, began shooting at shoppers in the Tacoma Mall in Tacoma, Washington. After he stopped shooting, he barricaded himself and four hostages in a store. The shooter was apprehended by police after a three-hour standoff. No one was killed; six people were wounded.

Burger King and Huddle House

On November 22, 2005, at 6:10 a.m., an unidentified male armed with a rifle, began shooting in a Burger King in North Augusta, South Carolina, and then ran to a nearby Huddle House restaurant, where he continued shooting before fleeing. One person was killed; two were wounded. The suspect was still at large as of September 2014.

Santa Barbara U.S. Postal Processing and Distribution Center

On January 30, 2006, at 7:15 p.m., former postal worker Jennifer San Marco (female), 44, armed with a handgun, began shooting at her previous place of employment, the Santa Barbara U.S. Postal Processing and Distribution Center in Goleta, California. Six people were killed; no one was wounded. The shooter committed suicide before police arrived.

Pine Middle School

On March 14, 2006, at 9:00 a.m., James Scott Newman, 14, armed with a handgun, began shooting outside the cafeteria at Pine Middle School in Reno, Nevada. No one was killed; two were wounded. The shooter was restrained by a teacher until police arrived and took him into custody.

Residence in Capitol Hill Neighborhood, Seattle, Washington

On March 25, 2006, at 7:03 a.m., Kyle Aaron Huff, 28, armed with a handgun, a shotgun, and a rifle, began shooting at a rave after-party in the Capitol Hill neighborhood of Seattle, Washington. Six people were killed; two were wounded. The shooter committed suicide as police confronted him.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
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- House of Worship

Safeway Warehouse

On June 25, 2006, at 3:03 p.m., Michael Julius Ford, 22, armed with a handgun, began shooting in a Safeway warehouse in Denver, Colorado, after having recently been passed over for a job promotion. After shooting at his co-workers, he began setting fires in the warehouse. One person was killed; five were wounded, including one police officer. The shooter was killed by police during an exchange of gunfire.

Jewish Federation of Greater Seattle

On July 28, 2006, at 4:00 p.m., Naveed Afzal Haq, 30, armed with two handguns, began shooting in the Jewish Federation of Greater Seattle in Seattle, Washington. He had forced his way in by holding a gun to a 13-year-old girl's head. One person was killed; five were wounded. The shooter surrendered to police and was taken into custody.

Essex Elementary School and Two Residences

On August 24, 2006, at 1:55 p.m., Christopher Williams, 26, armed with a handgun, shot at various locations in Essex, Vermont. He began by fatally shooting his ex-girlfriend's mother at her home and then drove to Essex Elementary School, where his ex-girlfriend was a teacher. He did not find her, but as he searched, he killed one teacher and wounded another. He then fled to a friend's home, where he wounded one person. A total of two people were killed; two were wounded. The shooter also shot himself twice but survived and was apprehended when police arrived at the scene.

Orange High School and Residence

On August 30, 2006, at 1:00 p.m., Alvaro Castillo, 19, armed with two pipe bombs, two rifles, a shotgun, and a smoke grenade, began shooting a rifle from his vehicle at his former high school, Orange High School in Hillsborough, North Carolina. He had fatally shot his father in his home that morning. One person was killed; two were wounded. The shooter was apprehended by police.

Weston High School

On September 29, 2006, at 8:00 a.m., Eric Jordan Hainstock, 15, armed with a handgun and a rifle, began shooting in Weston High School in Cazenovia, Wisconsin. One person was killed; no one was wounded. The shooter was restrained by school employees until police arrived and took him into custody.

West Nickel Mines School

On October 2, 2006, at 10:30 a.m., Charles Carl Roberts, IV, 32, armed with a rifle, a shotgun, and a handgun, began shooting at the West Nickel Mines School in Bart Township, Pennsylvania. After the shooter entered the building, he ordered all males and adults out of the room. After a 20-minute standoff, he began firing. The shooter committed suicide as the police began to breach the school through a window. Five people were killed; five were wounded.

Memorial Middle School

On October 9, 2006, at 7:40 a.m., Thomas White, 13, armed with a rifle and a handgun, began shooting in Memorial Middle School in Joplin, Missouri. His rifle jammed after firing one shot. Hearing the shot, the school principal located the shooter, escorted him from the building, and turned him over to police. No one was killed or wounded.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Trolley Square Mall

On February 12, 2007, at 6:42 p.m., Sulejman Talovic, 18, armed with a shotgun and a handgun, began shooting as he entered the Trolley Square Mall in Salt Lake City, Utah. Five people were killed; four were wounded. The shooter was killed during an exchange of gunfire by responding officers, including an off-duty police officer who was in the mall at the time of the shooting.

ZigZag Net, Inc.

On February 12, 2007, at 8:00 p.m., Vincent Dortch, 44, armed with a rifle and a handgun, began shooting during a ZigZag Net, Inc. board meeting at the Naval Business Center in Philadelphia, Pennsylvania. The shooter had scheduled the board meeting to discuss a financial dispute with other board members. Three people were killed; one was wounded. The shooter committed suicide after firing at the police.

Kenyon Press

On March 5, 2007, at 9:00 a.m., Alonso Jose Mendez, 68, armed with a handgun, began shooting at his co-workers in the Kenyon Press facility in Signal Hill, California. No one was killed; three were wounded. The shooter committed suicide before police arrived.

Virginia Polytechnic Institute and State University

On April 16, 2007, at 7:15 a.m., Seung Hui Cho, 23, armed with two handguns, began shooting in a dormitory at Virginia Polytechnic Institute and State University in Blacksburg, Virginia. Two-and-a-half hours later, he chained the doors shut in a classroom building and began shooting at the students and faculty inside. Thirty-two people were killed; 17 were wounded. In addition, six students were injured jumping from a second floor classroom and were not included in other reported injury totals. The shooter committed suicide as police entered the building.

Target Store

On April 29, 2007, at 3:25 p.m., David Wayne Logsdon, 51, armed with a rifle, shot an officer after being pulled over near a Target retail store in the Ward Parkway Shopping Center in Kansas City, Missouri. He drove into the Target parking lot and continued shooting as he ran into the building. Two people were killed; eight were wounded, including one police officer. The shooter was killed by police.

Residence, Latah County Courthouse, and First Presbyterian Church

On May 19, 2007, around 11:00 p.m., Jason Kenneth Hamilton, 36, armed with two rifles, began shooting outside the Latah County Courthouse in Moscow, Idaho, killing one police officer and wounding two people, including another police officer. He then fled to the First Presbyterian Church across the street and continued shooting, killing a citizen and wounding two people, including another police officer. Before driving to the courthouse, he had fatally shot his wife in their residence. A total of three people were killed; three were wounded. The shooter committed suicide after police arrived.

Liberty Transportation

On August 8, 2007, at 3:15 p.m., Calvin Coolidge Neyland Jr., 43, armed with at least two handguns and two rifles, began shooting at his co-workers in the Liberty Transportation facility in Perrysburg, Ohio. He had just been fired. Two people were killed; no one was wounded. The shooter fled the scene and was apprehended by police two hours later.

Key
- Commerce
- Education
- Government
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- Residences
- Health Care
- House of Worship

Co-op City Apartment Building's Leasing Office

On August 30, 2007, at 7:50 a.m., Paulino Valenzuela, 44, armed with a handgun, began shooting in Co-op City's leasing office in the Bronx, New York. He had recently lost his job as a janitor at Co-op City and had filed a lawsuit to get his job back. One person was killed; two were wounded. The shooter fled the scene and later surrendered to police and was taken into custody.

Giordano and Giordano Law Office

On October 4, 2007, at 2:00 p.m., John Chester Ashley, 63, armed with a handgun, began shooting in the Giordano and Giordano law office in Alexandria, Louisiana. Two people were killed; three were wounded. The shooter was killed by police after a 10-hour standoff.

Residence in Crandon, Wisconsin

On October 7, 2007, at 2:45 a.m., Tyler Peterson, 20, a sheriff's deputy armed with a rifle, began shooting during a party at his ex-girlfriend's house in Crandon, Wisconsin. Six people were killed, including his ex-girlfriend; one was wounded. The shooter later committed suicide during an exchange of gunfire with police.

Am-Pac Tire Pros

On October 8, 2007, at 7:30 a.m., Robert Becerra, 29, armed with a handgun, began shooting at customers and employees of Am-Pac Tire Pros in Simi Valley, California. One person was killed; two were wounded. The shooter committed suicide before police arrived.

SuccessTech Academy

On October 10, 2007, at 1:02 p.m., Asa Halley Coon, 14, armed with two handguns, began shooting in SuccessTech Academy in Cleveland, Ohio. No one was killed; four were wounded. The shooter committed suicide before police arrived.

Von Maur in Westroads Mall

On December 5, 2007, at 1:42 p.m., Robert Arthur Hawkins, 19, armed with a rifle, began shooting as he exited the elevator on the third floor of the Von Maur department store in the Westroads Mall in Omaha, Nebraska. Eight people were killed; four were wounded. The shooter committed suicide before police arrived.

Youth with a Mission Training Center/New Life Church

On December 9, 2007, at 12:29 a.m., Matthew John Murray, 24, armed with a rifle, two handguns, and smoke bombs, entered the Youth with a Mission Training Center in Arvada, Colorado, and began shooting. Two people were killed; two were wounded. He then walked seven miles overnight to the New Life Church in Colorado Springs, Colorado, and began shooting again. The shooter had been expelled from the training center three years prior to the incident. Two additional people were killed there; three more were wounded. The shooter committed suicide after being shot by church security. A total of four people were killed; five were wounded.

Kirkwood City Hall

On February 7, 2008, at 7:00 p.m., Charles Lee Thornton, 52, armed with two handguns, shot a police officer outside the Kirkwood City Hall in Kirkwood, Missouri. He then took the officer's gun and continued shooting inside the Kirkwood City Council chambers. Six people were killed, including two police officers; no one was wounded. The shooter was killed by responding officers who came from the police department across the street.

Key
- Commerce
- Education
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- Open Space
- Residences
- Health Care
- House of Worship

Louisiana Technical College

On February 8, 2008, at 8:35 a.m., Latina Williams (female), 23, armed with a handgun, began shooting in a second-floor classroom at Louisiana Technical College in Baton Rouge, Louisiana. She fired six rounds, then reloaded and committed suicide before police arrived. Two people were killed; no one was wounded.

Cole Hall Auditorium, Northern Illinois University

On February 14, 2008, at 3:00 p.m., Steven Phillip Kazmierczak, 27, armed with a shotgun and three handguns, began shooting in the Cole Hall Auditorium at Northern Illinois University in DeKalb, Illinois. He had attended graduate school at the university. Five people were killed; 16 were wounded, including three who were injured as they fled. The shooter committed suicide before police arrived.

Wendy's Fast Food Restaurant

On March 3, 2008, at 12:15 p.m., Alburn Edward Blake, 60, armed with a handgun, began shooting in a Wendy's restaurant in West Palm Beach, Florida. One person was killed; four were wounded. The shooter committed suicide before police arrived.

Player's Bar and Grill

On May 25, 2008, at 2:25 a.m., Ernesto Villagomez, 30, armed with a handgun, began firing inside Player's Bar and Grill in Winnemucca, Nevada. Two people were killed; two were wounded. The shooter was killed by a citizen with a valid firearm permit before police arrived.

Atlantis Plastics Factory

On June 25, 2008, at 12:00 a.m., Wesley Neal Higdon, 25, armed with a handgun, began firing at his co-workers in the Atlantis Plastics factory in Henderson, Kentucky. Prior to the incident, he was reprimanded by a supervisor for having an argument with a co-worker and was escorted from the plant. He returned a short time later and began shooting. Five people were killed; one was wounded. The shooter committed suicide before police arrived.

Tennessee Valley Unitarian Universalist Church

On July 27, 2008, at 10:18 a.m., Jim David Adkisson, 58, armed with a shotgun, began shooting in the Tennessee Valley Unitarian Universalist Church in Knoxville, Tennessee. Two people were killed; seven were wounded. The shooter was restrained by citizens before police arrived and took him into custody.

Interstate 5 in Skagit County, Washington

On September 2, 2008, at 2:15 p.m., Isaac Lee Zamora, 28, armed with a rifle, shot a police officer at the shooter's home and then drove down Interstate 5 near Alger in Skagit County, Washington, shooting drivers and another police officer. Six people were killed, including one police officer; four were wounded, including one police officer. The shooter drove to a police station and surrendered 40 minutes after the incident began.

The Zone

On January 24, 2009, at 10:37 p.m., Erik Salvador Ayala, 24, armed with a handgun, began shooting at a crowd outside of The Zone, an under-21 nightclub in Portland, Oregon, and then shot himself before police arrived. He died in the hospital two days later. Two people were killed; seven were wounded.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Coffee and Geneva Counties, Alabama

On March 10, 2009, at 4:00 p.m. Michael Kenneth McLendon, 28, armed with a rifle, killed five family members at various locations as he traveled through Coffee and Geneva Counties in southeast Alabama and continued shooting. A total of 10 people were killed; one police officer was wounded. During an exchange of gunfire with police, the shooter committed suicide.

Pinelake Health and Rehabilitation Center

On March 29, 2009, at 10:00 a.m., Robert Kenneth Stewart, 45, armed with a handgun, a shotgun, and a rifle, began shooting in the Pinelake Health and Rehabilitation Center in Carthage, North Carolina, where his estranged wife worked. He did not find her. Eight people were killed; three were wounded, including one police officer. The shooter was apprehended after being wounded during an exchange of gunfire with police.

American Civic Association Center

On April 3, 2009, at 10:31 a.m., Linh Phat Voong, aka Jiverly Wong, 41, armed with two handguns, began shooting in the American Civic Association Center in Binghamton, New York. He previously had taken classes at the center. The shooter blocked the back door of the building with his car and then entered through the front door. Thirteen people were killed; four were wounded. The shooter committed suicide before police arrived.

Kkottongnae Retreat Camp

On April 7, 2009 at 7:23 p.m., John Suchan Chong, 69, armed with a handgun, began shooting at residents in the Kkottongnae Retreat Camp in Temecula, California, where he was employed as a handyman. The shooter walked from cabin to cabin shooting residents until he was restrained by citizens. One person was killed; two were wounded.

Harkness Hall at Hampton University

On April 26, 2009, at 12:57 a.m., Odane Greg Maye, 18, armed with three handguns, began shooting in Harkness Hall, a residence hall at Hampton University in Hampton, Virginia, and then shot himself before police arrived. The shooter had briefly attended the university. A dormitory manager pulled the fire alarm when the shooting began, emptying the building. No one was killed; two were wounded. He was apprehended by police.

Larose-Cut Off Middle School

On May 18, 2009, at 9:00 a.m., Justin Doucet, 15, armed with a handgun, fired once at a teacher at Larose-Cut Off Middle School in Cut Off, Louisiana, then went to the bathroom and shot himself. He died a week later. No one was killed or wounded.

U.S. Army Recruiting Center

On June 1, 2009, at 10:19 a.m., Carlos Leon Bledsoe, aka Adbulhakim Mujahid Muhammad, 23, armed with two rifles and a handgun, drove up and began firing on soldiers outside the U.S. Army Recruiting Center in North Little Rock, Arkansas. One person was killed; one was wounded. The shooter was apprehended by police.

United States Holocaust Memorial Museum

On June 10, 2009, at 12:52 p.m., James Wenneker von Brunn, 88, armed with a rifle, began shooting in the United States Holocaust Memorial Museum in Washington, D.C. He shot the security guard who opened the door to the building and exchanged gunfire with other security guards. One person was killed; no one was wounded. The shooter was wounded and died in custody six months later.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Family Dental Care
On July 1, 2009, at 10:30 a.m., Jaime Paredes, 30, armed with a rifle, allegedly began shooting in his wife's place of employment, Family Dental Care office in Simi Valley, California. She had recently filed for divorce. His wife was killed; four were wounded. The shooter was apprehended by police.

Club LT Tranz
On July 25, 2009, at 4:40 a.m., an unidentified shooter began shooting at employees of Club LT Tranz in Houston, Texas. One person was killed; two were wounded. The suspect was still at large as of September 2014.

LA Fitness
On August 4, 2009, at 7:56 p.m., George Sodini, 48, armed with three handguns, began shooting in a LA Fitness aerobics class at the Great Southern Shopping Center in Collier Township, Pennsylvania. He entered the gym, removed his guns from his gym bag, and began firing in the aerobics studio. Three people were killed; nine were wounded. The shooter committed suicide before police arrived.

Multiple Locations in Owosso, Michigan
On September 11, 2009, at 7:20 a.m., Harlan James Drake, 33, armed with three handguns, shot at people at two locations in Owosso, Michigan. He shot a protestor on the street and then drove to a gravel quarry, where he killed another person. Two people were killed; no one was wounded. The shooter surrendered to police a few hours later and was taken into custody.

Fort Hood Soldier Readiness Processing Center
On November 5, 2009, at 1:20 p.m., Nidal Malik Hasan, 39, armed with two handguns, began shooting inside the Fort Hood Soldier Readiness Processing Center in Fort Hood, Texas. Thirteen people were killed; 32 were wounded, including one police officer. During an exchange of gunfire, the shooter was wounded and taken into custody.

Reynolds, Smith and Hills
On November 6, 2009, at 11:44 a.m., Jason Samuel Rodriguez, 40, armed with a handgun, began shooting in the consulting firm of Reynolds, Smith and Hills in Orlando, Florida, his former workplace. One person was killed; five were wounded. The shooter surrendered to police a few hours later at a family member's home.

Sandbar Sports Grill
On November 7, 2009, at 7:28 p.m., Richard Allan Moreau, 63, armed with a handgun, began shooting in the Sandbar Sports Grill in Vail, Colorado. Before the attack, Moreau had an argument inside the bar and was escorted out by security. One person was killed; three were wounded. The shooter was apprehended by responding police.

Legacy Metrolab
On November 10, 2009, at 11:49 a.m., Robert Beiser, 39, armed with a handgun, a rifle, and a shotgun, began firing in the Legacy Metrolab in Tualatin, Oregon, his wife's place of employment. One week earlier, his wife had filed for divorce. His wife was killed; two were wounded. The shooter committed suicide before police arrived.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Forza Coffee Shop

On November 29, 2009, at 8:15 a.m., Maurice Clemmons, aka Dawson A. Carlisle, 37, armed with a handgun, began shooting in the Forza Coffee Shop in Pierce County, Washington, a regular gathering place for police officers. Four uniformed police officers were killed at the scene; no one was wounded. The shooter was killed during an exchange of gunfire with police after a two-day manhunt.

Grady Crawford Construction Company

On December 23, 2009, at 1:50 p.m., Richard Matthews, 53, armed with a handgun, allegedly began shooting in the Grady Crawford Construction facility in Baton Rouge, Louisiana. Two people were killed; one was wounded. The shooter was restrained by his co-workers until police arrived and took him into custody.

Lloyd D. George U.S. Courthouse and Federal Building

On January 4, 2010, at 8:02 a.m., Johnny Lee Wicks Jr., 66, armed with a shotgun, began firing inside the lobby of the Lloyd D. George Federal Building and U.S. Courthouse in Las Vegas, Nevada. He had recently filed a lawsuit against the Social Security Administration over a reduction in his benefits. One person was killed; one federal law enforcement officer was wounded. The shooter was killed by federal law enforcement officers as he fled the scene.

ABB Plant

On January 7, 2010, at 6:30 a.m., Timothy Hendron, 51, armed with two handguns, a shotgun, and a rifle, began shooting at his co-workers in the parking lot at the ABB Plant in St. Louis, Missouri, before moving into the building. He was a party in a pending lawsuit against his employer regarding the company's retirement plan. Three people were killed; five were wounded. The shooter committed suicide before police arrived.

Penske Truck Rental

On January 12, 2010, at 2:00 p.m., Jesse James Warren, 60, armed with two handguns, allegedly began shooting in the Penske Truck Rental facility in Kennesaw, Georgia, from where he had recently been fired. He entered through the ground-level bay area where trucks were kept. Three people were killed; two were wounded. The shooter was apprehended by police.

Residence in Brooksville, Florida

On January 14, 2010, at 2:59 p.m., John William Kalisz, 55, armed with a handgun, began shooting in a residence in Brooksville, Florida, where family members ran a home-based business. He then fled to a gas station, where he exchanged gunfire with police. Three people were killed, including one police officer and one family member; two were wounded, including one family member. The shooter was shot and apprehended by police.

Farm King Store

On February 3, 2010, at 12:45 p.m., Jonathan Joseph Labbe, 19, armed with a rifle, began shooting inside a Farm King Store in Macomb, Illinois. Eight people barricaded themselves in the office and remained hidden until police arrived. No one was killed or wounded. The shooter committed suicide after police arrived.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Inskip Elementary School

On February 10, 2010, at 12:49 p.m., Mark Stephen Foster, 48, armed with a handgun, began shooting inside Inskip Elementary School in Knoxville, Tennessee. He had just been informed that his teaching contract would not be renewed. The shooting occurred after he left the office and returned with a gun. No one was killed; two members of the administration were wounded. The shooter was apprehended by responding police.

Shelby Center, University of Alabama

On February 12, 2010, at 4:00 p.m., Amy Bishop Anderson (female), 44, armed with a handgun, began shooting during a biology department meeting in the Shelby Center at the University of Alabama in Huntsville, Alabama. She sat in the meeting for 30 minutes, then stood up and began firing. Three people were killed; three were wounded. The shooter surrendered to responding police.

Deer Creek Middle School

On February 23, 2010, at 3:10 p.m., Bruco Strongeagle Eastwood, 32, armed with a rifle, began shooting in Deer Creek Middle School in Littleton, Colorado. No one was killed; two people were wounded. The shooter was restrained by teachers until police arrived and took him into custody.

The Pentagon

On March 4, 2010, at 6:36 p.m., John Patrick Bedell, 36, armed with a handgun, began shooting at Pentagon police officers as he approached the entrance to the security screening area at the Pentagon in Arlington, Virginia. No one was killed; two federal law enforcement officers were wounded. The shooter was killed by federal law enforcement officers.

The Ohio State University, Maintenance Building

On March 9, 2010, at 3:30 a.m., Nathaniel Alvin Brown, 50, armed with two handguns, began shooting in the maintenance building at The Ohio State University in Columbus, Ohio. He had just been fired for allegedly lying on his job application. One person was killed; one was wounded. The shooter committed suicide before police arrived.

Publix Super Market

On March 30, 2010, at 12:00 p.m., Arunya Rouch (female), 41, armed with a handgun, began shooting in the parking lot of a Publix Supermarket in Tarpon Springs, Florida, killing one person. She had just been fired from the store for threatening a co-worker. She continued shooting on her way into the store, passing customers on the way to her former supervisor's office. Responding police officers intercepted her before she reached the office. After an exchange of gunfire, she was wounded. One person was killed; no one was wounded.

Parkwest Medical Center

On April 19, 2010, at 4:30 p.m., Abdo Ibssa, 38, armed with a handgun, began shooting in the Parkwest Medical Center in Knoxville, Tennessee. He had been distressed over the outcome of his recent surgery and was trying to find his doctor, who he believed had implanted a microchip in him. When he was unable to find the doctor, he moved to the emergency room and began shooting. One person was killed; two were wounded. The shooter committed suicide before police arrived.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Blue Sky Carnival

On May 7, 2010, at 10:22 p.m., Rasheed Cherry, 17, armed with a handgun, began shooting as he ran through the crowd at a carnival in Bloomfield, New Jersey operated by Blue Sky Amusements and Entertainment, Ltd. No one was killed; one person was wounded. The shooter was shot by responding police and died several days later.

Boulder Stove and Flooring

On May 17, 2010, at 11:05 a.m., Robert Phillip Montgomery, 53, armed with a handgun, began shooting at the owners in the back office of Boulder Stove and Flooring in Boulder, Colorado. Two people were killed; no one was wounded. The shooter committed suicide before police arrived.

AT&T Cellular

On May 27, 2010 at 1:00 p.m., Abraham Dickan, 79, armed with a handgun, began shooting in an AT&T Wireless Store in New York Mills, New York. He had recently been reported to the police by AT&T for harassing and threatening employees. No one was killed; one person was wounded. The shooter was killed by an off-duty police officer who was a customer in the store.

Yoyito Café

On June 6, 2010, at 10:00 p.m., Gerardo Regalado, 37, armed with a handgun, began shooting in Yoyito Café in Hialeah, Florida, where his estranged wife was employed. Four people were killed, including his estranged wife; three were wounded. The shooter fled the scene and committed suicide several blocks away.

Emcore Corporation

On July 12, 2010, at 9:30 a.m., Robert Reza, 37, armed with a handgun, began shooting in the Emcore Corporation building in Albuquerque, New Mexico, his girlfriend's place of employment. After confronting her, he began shooting throughout the building. Two people were killed; four were wounded, including his girlfriend. The shooter committed suicide after corporate security arrived.

Hartford Beer Distribution Center

On August 3, 2010, at 7:00 a.m., Omar Sheriff Thornton, 34, armed with two handguns, began shooting at his co-workers in the Hartford Beer Distribution Center in Manchester, Connecticut. He had been asked to quit for stealing beer from the warehouse. Eight people were killed; two were wounded. The shooter committed suicide after police arrived.

Kraft Foods Factory

On September 9, 2010, at 8:35 p.m., Yvonne Hiller (female), 43, armed with a handgun, began shooting at her co-workers in the Kraft Foods Factory in Philadelphia, Pennsylvania. She had just been suspended from her job and escorted from the building, but then returned. Two people were killed; one was wounded. The shooter and police exchanged gunfire, and she was apprehended a short time later.

Fort Bliss Convenience Store

On September 20, 2010, at 3:00 p.m., Steven Jay Kropf, 63, armed with a handgun, began shooting in a convenience store at Fort Bliss in El Paso, Texas. One person was killed; one was wounded. The shooter was killed by police.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

AmeriCold Logistics

On September 22, 2010, at 9:54 p.m., Akouch Kashoual, 26, armed with a handgun, began shooting at his co-workers in the break room of the AmeriCold Logistics plant in Crete, Nebraska. No one was killed; three were wounded. The shooter committed suicide before police arrived.

Gainesville, Florida

On October 4, 2010, at 4:00 p.m., Clifford Louis Miller Jr., 24, armed with a handgun, began shooting as he drove around Gainesville, Florida. One person—his father—was killed; five were wounded. The shooter committed suicide in a friend's driveway 13 minutes after the shooting began.

Kelly Elementary School

On October 8, 2010, at 12:10 p.m., Brendan O'Rourke, aka Brandon O'Rourke, 41, armed with a handgun, began shooting at Kelly Elementary School in Carlsbad, California, after having jumped the school fence. No one was killed; two students were wounded. The shooter was tackled and restrained by nearby construction workers until police arrived and took him into custody.

Washington, D.C. Department of Public Works

On October 13, 2010, at 6:14 a.m., an unidentified shooter, armed with a handgun, entered a Department of Public Works fleet management center in Washington, D.C., and began shooting. One person was killed; one was wounded. The shooter escaped before police arrived. The suspect was still at large as of September 2014.

Walmart

On October 29, 2010, at 8:57 a.m., John Dennis Gillane, 45, armed with two handguns, began shooting at his co-workers in a Walmart store in Reno, Nevada. The shooter purchased ammunition for one of the handguns at the store before the shooting. No one was killed; three were wounded. The shooter surrendered to police after a standoff where he barricaded himself in an office.

Panama City School Board Meeting

On December 14, 2010, at 2:14 p.m., Clay Allen Duke, 56, armed with a handgun, began shooting during a school board meeting in the Nelson Administrative Building in Panama City, Florida. The shooter's wife had previously been employed by the school district. After allowing several people to leave the room, the shooter fired in the direction of board members. No one was killed or wounded. The shooter committed suicide during an exchange of gunfire with the school district's armed security.

Millard South High School

On January 5, 2011, at 12:44 p.m., Richard L. Butler Jr., 17, armed with a handgun, began shooting in Millard South High School in Omaha, Nebraska. Earlier that day, the assistant principal had suspended the shooter for allegedly driving his car onto the football field. The assistant principal was killed; the principal was wounded. The shooter committed suicide after fleeing the site of the shooting.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Safeway Grocery

On January 8, 2011, at 10:10 a.m., Jared Lee Loughner, 22, armed with a handgun, began shooting during a congressional town hall meeting sponsored by U.S. Representative Gabrielle Giffords outside a Safeway store in Tucson, Arizona. Six people were killed; 13 were wounded, including Rep. Giffords. The shooter was restrained by citizens before police arrived and took him into custody.

Minaret Temple 174

On April 8, 2011, at 11:27 p.m., Kanai Daniel Avery, 16, armed with a handgun, allegedly began shooting during a party at the Minaret Temple 174 in Chester, Pennsylvania. Two people were killed; eight were wounded. The shooter was apprehended by police.

Copley Township Neighborhood, Ohio

On August 7, 2011, at 10:55 a.m., Michael Edward Hance, 51, armed with two handguns, began shooting in a neighborhood in Copley Township, Ohio, where many of his girlfriend's family members were present. Seven people were killed; his girlfriend was wounded. The shooter was killed by police.

House Party in South Jamaica, New York

On August 27, 2011, at 12:40 a.m., Tyrone Miller, 22, and an additional unidentified shooter(s), armed with handguns, allegedly began shooting at a house party in the Queens, New York, neighborhood of South Jamaica. Miller had left the party earlier that night after getting into an argument. He returned 10 minutes later and opened fire. No one was killed; 11 were wounded. The shooter(s) escaped, and Miller was arrested two years later in North Carolina. The unidentified suspect(s) was still at large as of September 2014.

International House of Pancakes

On September 6, 2011, at 8:58 a.m., Eduardo Sencion, aka Eduardo Perez-Gonzalez, 32, armed with a rifle, began shooting in an International House of Pancakes in Carson City, Nevada. Three members of the U.S. Air National Guard were killed, and two were wounded. In total, four people were killed; seven were wounded. The shooter committed suicide before police arrived.

Crawford County Courthouse

On September 13, 2011, at 3:37 p.m., Jesse Ray Palmer, 48, armed with three handguns and a rifle, entered the Crawford County Courthouse in Girard, Kansas. He inquired about the location of a specific judge, who was not in the building, and then shot and wounded the judge's secretary. No one was killed; one person was wounded. The shooter was killed by police.

Lehigh Southwest Cement Plant

On October 5, 2011, at 4:15 a.m., Frank William Allman, aka Shareef Allman, 49, armed with two rifles, one shotgun, and one handgun, began shooting at his co-workers in the Lehigh Southwest Cement plant in Cupertino, California, after he had locked the door during a meeting with them. Three people were killed; seven were wounded. The shooter was killed by police after fleeing the scene.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Salon Meritage

On October 12, 2011, at 1:20 p.m., Scott Evans Dekraai, 41, armed with three handguns and wearing body armor, began shooting in Salon Meritage, in Seal Beach, California, his ex-wife's place of employment. Seven people were killed, including his ex-wife; one was wounded. The shooter fled the scene and was later apprehended by police.

Southern California Edison Corporate Office Building

On December 16, 2011, at 1:30 p.m., Andre Turner, 51, armed with a handgun, began shooting his at his co-workers in a Southern California Edison corporate office building in Irwindale, California. Turner had just been told he would not receive a Christmas bonus and might be laid off. Two people were killed; two were wounded. The shooter committed suicide before police arrived.

McBride Lumber Company

On January 13, 2012, at 6:10 a.m., Ronald Dean Davis, 50, armed with a shotgun, began shooting at his co-workers in McBride Lumber Company in Star, North Carolina. Three people were killed; one was wounded. The shooter shot himself at another location and later died in the hospital.

Middletown City Court

On February 8, 2012, at 9:05 a.m., Timothy Patrick Mulqueen, 43, armed with a shotgun, began shooting as he entered the Middletown City Court in Middletown, New York. No one was killed; one police officer was wounded. The shooter was killed by police.

Chardon High School

On February 27, 2012, at 7:30 a.m., Thomas Michael Lane, III, 17, armed with a handgun, began shooting in the cafeteria at Chardon High School in Chardon, Ohio. The shooter was chased out of the building by a school coach. Three people were killed; three were wounded. The shooter was apprehended by police near the school.

University of Pittsburgh Medical Center, Western Psychiatric Institute and Clinic

On March 8, 2012, at 1:40 p.m., John Schick, 30, armed with two handguns, began shooting inside the lobby of the Western Psychiatric Institute and Clinic at the University of Pittsburgh Medical Center in Pittsburgh, Pennsylvania. One person was killed; seven were wounded, including one police officer. The shooter was killed by University of Pittsburgh police.

J.T. Tire

On March 23, 2012, at 3:02 p.m., O'Brian McNeil White, 24, armed with a handgun, began shooting in the J.T. Tire store in Durham, North Carolina. Two people were killed; two were wounded. The shooter fled but was arrested a week later.

Oikos University

On April 2, 2012, at 10:30 a.m., Su Nam Ko, aka One L. Goh, 43, armed with a handgun, began shooting inside Oikos University in Oakland, California. He then killed a woman to steal her car. Seven people were killed; three were wounded. The shooter was arrested by police later that day.

Streets of Tulsa, Oklahoma

On April 6, 2012, at 1:03 a.m., Jacob Carl England, 19, and Alvin Lee Watts, 32, each armed with a handgun, began shooting as they drove around the streets of Tulsa, Oklahoma. Three people were killed; two were wounded. The shooters were arrested by police the next day.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Café Racer
On May 30, 2012, at 10:52 a.m., Ian Lee Stawicki, 40, armed with two handguns, began shooting inside Café Racer in Seattle, Washington, where he had been banned from entering because of previous incidents. He then fled to a parking lot, where he killed a woman to steal her car. Five people were killed; no one was wounded. The shooter committed suicide at another location.

Copper Top Bar
On July 17, 2012, at 12:29 a.m., Nathan Van Wilkins, 44, armed with a rifle, allegedly began shooting in the Copper Top Bar in Tuscaloosa, Alabama. Prior to the shooting, he shot a person in a nearby subdivision. No one was killed; 18 people were wounded. The shooter was apprehended later by police.

Cinemark Century 16
On July 20, 2012, at 12:30 a.m., James Eagan Holmes, 24, armed with a rifle, a shotgun, and a handgun, allegedly began shooting after releasing tear gas canisters in a theater at the Cinemark Century 16 movie theaters in Aurora, Colorado. Twelve people were killed; 58 were wounded. The shooter, who was wearing body armor, was apprehended by police. Police later found the shooter's apartment booby-trapped with explosives.

Sikh Temple of Wisconsin
On August 5, 2012, at 10:25 a.m., Wade Michael Page, 40, armed with a handgun, began shooting outside the Sikh Temple of Wisconsin in Oak Creek, Wisconsin and then moved inside and continued to shoot. The shooter exited the building and confronted the responding police officer, wounding him. He then fired on a second responding police officer, who returned fire and wounded the shooter. Six people were killed; four were wounded, including one police officer. The shooter committed suicide after being shot in the stomach by the second responding officer.

Perry Hall High School
On August 27, 2012, at 10:45 a.m., Robert Wayne Gladden Jr., 15, armed with a shotgun, shot a classmate in the cafeteria of Perry Hall High School in Baltimore, Maryland. The shooter had an altercation with another student before the shooting began. He left the cafeteria and returned with a gun. No one was killed; one person was wounded. The shooter was restrained by a guidance counselor before being taken into custody by the school's resource officer.

Pathmark Supermarket
On August 31, 2012, at 4:00 a.m., Terence Tyler, 23, armed with a rifle and a handgun, began shooting at his co-workers in a Pathmark supermarket in Old Bridge, New Jersey. He returned after his shift dressed in military fatigues and carrying his weapons. He shot at a co-worker outside the store who ran inside and locked the door, warning other employees. The shooter gained entry to the store by shooting out the lock. Two people were killed; no one was wounded. The shooter committed suicide before police arrived.

Accent Signage Systems
On September 27, 2012, at 4:35 p.m., Andrew John Engeldinger, 36, armed with a handgun, began shooting in the Accent Signage Systems facility in Minneapolis, Minnesota. The shooter had just been fired from the company. Six people were killed; two were wounded. The shooter committed suicide before police arrived.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Las Dominicanas M&M Hair Salon

On October 18, 2012, at 11:04 a.m., Bradford Ramon Baumet, 36, armed with a handgun, began shooting in the Las Dominicanas M&M Hair Salon in Casselberry, Florida. The shooter had been served earlier that month with a domestic violence court order involving his ex-girlfriend, who managed the salon. Three people were killed; his ex-girlfriend was wounded. The shooter committed suicide at another location.

Azana Day Salon

On October 21, 2012, at 11:09 a.m., Radcliffe Franklin Haughton, 45, armed with a handgun, began shooting in the Azana Day Salon in Brookfield, Wisconsin, his estranged wife's place of employment. Three were killed, including his estranged wife; four were wounded. The shooter committed suicide before police arrived.

Valley Protein

On November 6, 2012, at 8:15 a.m., Lawrence Jones, 42, armed with a handgun, began shooting at his co-workers in the Valley Protein processing plant in Fresno, California. The shooting took place midway through his shift. Two people were killed; two were wounded. The shooter committed suicide before police arrived.

Clackamas Town Center Mall

On December 11, 2012, at 3:25 p.m., Jacob Tyler Roberts, 22, armed with a rifle, began shooting at people waiting to see Santa Claus in the Clackamas Town Center Mall in Happy Valley, Oregon. Two people were killed; one was wounded. The shooter committed suicide before police arrived.

Sandy Hook Elementary School and Residence

On December 14, 2012, at 9:30 a.m., Adam Lanza, 20, armed with two handguns and a rifle, shot through the secured front door to enter Sandy Hook Elementary School in Newtown, Connecticut. He killed 20 students and six adults, and wounded two adults inside the school. Prior to the shooting, the shooter killed his mother at their home. In total, 27 people were killed; two were wounded. The shooter committed suicide after police arrived.

St. Vincent's Hospital

On December 15, 2012, at 4:00 a.m., Jason Heath Letts, 38, armed with a handgun, began shooting in St. Vincent's Hospital in Birmingham, Alabama. No one was killed; three were wounded, including one police officer. The shooter was killed by police.

Frankstown Township, Pennsylvania

On December 21, 2012, at 8:59 a.m., Jeffrey Lee Michael, 44, armed with two handguns, began shooting at citizens as he drove around Frankstown Township, Pennsylvania. Three people were killed; three police officers were wounded. The shooter was killed by police.

Taft Union High School

On January 10, 2013, at 8:59 a.m., Bryan Oliver, 16, armed with a shotgun, allegedly began shooting in a science class at Taft Union High School in Taft, California. No one was killed; two people were wounded. An administrator persuaded the shooter to put the gun down before police arrived and took him into custody.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Osborn Maledon Law Firm

On January 30, 2013, at 10:45 a.m., Arthur Douglas Harmon, III, 70, armed with a handgun, began shooting during a mediation session in the Osborn Maledon law firm in Phoenix, Arizona. Two people were killed; one was wounded. The shooter later committed suicide at another location.

John's Barbershop and Gaffey's Clean Car Center

On March 13, 2013, at 9:30 a.m., Kurt Myers, 64, armed with a shotgun, began shooting in John's Barbershop in Mohawk, New York, then drove to Gaffey's Clean Car Center in nearby Herkimer, New York, and continued shooting. The shooter then barricaded himself in an abandoned building in the vicinity. Four people were killed; two were wounded. The shooter was killed later by federal law enforcement officers.

New River Community College, Satellite Campus

On April 12, 2013, at 1:55 p.m., Neil Allen MacInnis, 22, armed with a shotgun, began shooting in the New River Community College satellite campus in the New River Valley Mall in Christiansburg, Virginia. No one was killed; two were wounded. The shooter was apprehended by police after being detained by an off-duty mall security officer as he attempted to flee.

Pinewood Village Apartments

On April 21, 2013, at 9:30 p.m., Dennis Clark III, 27, armed with a handgun and a shotgun, began shooting in the Pinewood Village Apartments in Federal Way, Washington. He shot his girlfriend in an apartment and then walked outside and continued shooting. Four people were killed, including his girlfriend; no one was wounded. The shooter was killed by police.

Brady, Texas and Jacksonville, North Carolina

On May 26, 2013, at 4:30 a.m., Esteban Jimenez Smith, 23, armed with a rifle and a handgun, began shooting from a moving vehicle as he drove down a road in Brady, Texas. He had earlier fatally shot his wife in Jacksonville, North Carolina. Two people were killed, including his wife; five were wounded, including one police officer. The shooter was killed by police.

Santa Monica College and Residence

On June 7, 2013, at 11:52 a.m., John Zawahri, 23, armed with a handgun, fatally shot his father and brother in their home in Santa Monica, California. He then carjacked a vehicle and forced the driver to take him to the Santa Monica College campus. He allowed the driver to leave her vehicle unharmed but continued shooting until he was killed in an exchange of gunfire with police. Five people were killed; four were wounded.

Parking Lots for Kellum Law Firm and Walmart

On June 21, 2013, at 11:44 a.m., Lakin Anthony Faust, 23, armed with a shotgun, began shooting outside the Kellum Law Firm in Greenville, North Carolina and then crossed the street and continued shooting at individuals in the Walmart parking lot. No one was killed; four were wounded. The shooter was wounded during an exchange of gunfire with police and then taken into custody.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Hialeah Apartment Building

On July 26, 2013, at 6:30 p.m., Pedro Alberto Vargas, 42, set his apartment complex on fire in Hialeah, Florida. Then, armed with a handgun, he began shooting outside the complex. Six people were killed; no one was wounded. The shooter barricaded himself and two hostages inside the apartment building. He was killed by police.

Pennsylvania Municipal Building

On August 5, 2013, at 7:19 p.m., Rockne Warren Newell, 59, armed with a rifle and a handgun, entered the Ross Township Municipal Building in Saylorsburg, Pennsylvania, during a Ross Township meeting. He allegedly shot through a wall into the meeting room and then entered the room and continued firing. Newell had a history of disputes with the township over permits for his home. Three people were killed; two were wounded. The shooter was restrained by citizens until police arrived and took him into custody.

Lake Butler, Florida

On August 24, 2013, at 9:20 a.m., Hubert Allen Jr., 72, armed with a rifle and a shotgun, began shooting at his co-workers from Pritchett Trucking, Inc., as he drove around Lake Butler, Florida. He then returned home, where he committed suicide. Two people were killed; two were wounded.

Washington Navy Yard Building 197

On September 16, 2013, at 8:16 a.m., Aaron Alexis, 34, armed with a shotgun, began shooting in Building 197 at the Washington Navy Yard in Washington, D.C. During the shootings, he shot a security officer and took the officer's handgun, allowing him to continue shooting when he ran out of shotgun shells. Twelve people were killed; seven were wounded, including two police officers. The shooter was killed by police.

Sparks Middle School

On October 21, 2013, at 7:16 a.m., Jose Reyes, 12, armed with a handgun, began shooting outside Sparks Middle School in Sparks, Nevada. A teacher was killed when he confronted the shooter; two people were wounded. The shooter committed suicide before police arrived.

Albuquerque, New Mexico

On October 26, 2013, at 11:20 a.m., Christopher Thomas Chase, 35, armed with three handguns and two rifles, began shooting at police officers in Albuquerque, New Mexico. The shooter, who was wearing body armor, forced a citizen to call the police and then ambushed and shot at the two responding officers before fleeing in their vehicle. Other officers were shot at while pursuing the shooter. No one was killed; four police officers were wounded. The shooter was killed by police during the pursuit, which ended when the vehicle crashed into a gas station pump.

Los Angeles International Airport

On November 1, 2013, at 9:18 a.m., Paul Anthony Ciancia, 23, armed with a rifle, allegedly began shooting in Terminal 3 of Los Angeles International Airport in Los Angeles, California. He pulled the gun from his duffle bag as he approached a security checkpoint, firing as he moved further into the terminal. One unarmed Transportation Security Administration security officer was killed and two were wounded; one additional citizen was also wounded. The shooter was wounded and then apprehended by police.

Key
- Commerce
- Education
- Government
- Open Space
- Residences
- Health Care
- House of Worship

Arapahoe High School

On December 13, 2013, at 12:30 p.m., Karl Halverson Pierson, 18, armed with a shotgun, machete, and three Molotov cocktails, began shooting in the hallways of Arapahoe High School in Centennial, Colorado. As he moved through the school and into the library, he fired one additional round and lit a Molotov cocktail, throwing it into a bookcase and causing minor damage. One person was killed; no one was wounded. The shooter committed suicide as a school resource officer approached him.

Renown Regional Medical Center

On December 17, 2013, at 2:00 p.m., Alan Oliver Frazier, 51, armed with a shotgun and two handguns, began shooting in the Renown Regional Medical Center in Reno, Nevada. One person was killed; two were wounded. The shooter committed suicide at the scene after police arrived.

Appendix B:

METHODOLOGY

The agreed upon definition of an active shooter by U.S. government agencies—including the White House, U.S. Department of Justice/FBI, U.S. Department of Education, and U.S. Department of Homeland Security/Federal Emergency Management Agency—is "an individual actively engaged in killing or attempting to kill people in a confined and populated area."[33] The FBI extends this definition to include individuals, because more than one shooter could be involved in some incidents. Implicit in the definition is that the subject's criminal actions undertaken include the use of a firearm. Though the federal definition includes the word confined, the FBI excluded this word when considering active shooter incidents. This is because the term confined could be interpreted to omit incidents that occurred outside a building, when in actuality, many incidents originated outside or progressed from indoors to outdoors, or vice-versa, or occurred entirely along a route of travel or at various locations.

The FBI developed discriminating factors to further differentiate potential active shooter incidents, considering for inclusion:

- Shootings in public places;
- Shootings occurring at more than one location;
- Shootings where the shooters' actions did not appear to be another criminal act;
- Shootings resulting in a mass killing;
- Shootings indicating an apparent spontaneity by the shooter;
- Shootings where the shooters appeared to methodically search for potential victims; or
- Shootings that appeared focused on injury to people, not buildings or objects.

Because the risk to civilians in active shooter incidents appears to do with the apparent randomness of so many victims, for purposes of this study, an event was excluded if research established it involved primarily the following factors:

- Conflicts arising from self-defense;
- Gang violence;
- Contained residential or domestic disputes;
- Controlled barricade/hostage situations;
- Crossfire as a byproduct of another ongoing criminal act; or
- Drug violence.

To evaluate appropriate incidents to include and exclude, the FBI reviewed published studies and research articles on actual shooting incidents or related research conducted by other government agencies, appointed gubernatorial panels, local advisory commissions, and other public and private entities.[34] Using the federal definition of active shooter and the

33 Federal Bureau of Investigation, Critical Incident Response Group, Active Shooter Event/Mass Casualty Events, November 2013, http://www.fbi.gov/about-us/cirg/active-shooter-and-mass-casualty-incidents; DHS Active Shooter Pocket Guide, http://www.dhs.gov/sites/default/files/publications/active_shooter_pocket_card_508.pdf.

34 John Paparazzo, Christine Eith, Jennifer Tocco, Strategic Approaches to Preventing Multiple Casualty Violence: Report on the National Summit on Multiple Casualty Shootings, U.S. Department of Justice, Office of Community Oriented Policing Services, 2013; Federal Law Enforcement Training Centers, Impact Report, U.S. Department of Homeland Security, 2013; Hon. William H. Erickson, Chairman, The Report of Governor Bill Owens' Columbine Review Commission, State of Colorado, May 2001; Chief Thomas G. Longo, Recommendations to the Florida Board of Governors Based Upon the Recommendations of the Florida Gubernatorial Task Force on Campus Safety, Florida University Chiefs of Police, March 2008; Mayor Scott Jackson, Sandy Hook Advisory Commission Interim Report of Findings, Sandy Hook Advisory Commission, March 2013; Federal Bureau of Investigation, Critical Incident Response Group, Active Shooter Event/Mass Casualty Events, November 2013; J. Pete Blair, M. Hunter Martaindale, Terry Nichols, FBI, Law Enforcement Bulletin: Active Shooter Events from 2000 to 2012, January 2014; Police Executive Research Forum (PERF), Critical Issues in Policing Series, The Police Response to Active Shooter Incidents, March 2014.

general list of exclusionary and inclusionary factors, the FBI identified shooting incidents that occurred during the 2000 to 2013 time span that might fit into this study. This set of incidents was gathered from FBI data as well as other previously published lists of shooting incidents, including a comprehensive list of incidents developed by the New York Police Department[35] and one of the most comprehensive studies of shooting incidents in the United States to date—a study from 2000 to 2010 conducted by researchers from Texas State University (TXST) and its Advanced Law Enforcement Rapid Response Training (ALERRT) Center.[36] The FBI collected further data from law enforcement reports and internal and open source information.[37] A panel representing local law enforcement, the FBI, and TXST then used a deliberative process[38] to identify the 160 active shooter incidents for this study. Researchers from TXST were consulted extensively throughout this analytical effort.

35 Raymond W. Kelly, Police Commissioner, Recommendations and Analysis for Risk Mitigation, New York City Police Department, 2010.

36 J. Pete Blair, Terry Nichols, David Burns, John R. Curnutt, Active Shooter Events and Response, CRC Press, 2013.

37 e.g.: U.S. Department of Defense, Internal Review of the Washington Navy Yard Shooting: A Report to the Secretary of Defense, 20 November 2013.; U.S. Department of Defense, Secretary of Defense, Memorandum on Final Recommendations of the Ft. Hood Follow-on Review, 18 August 2010; TriData Division, System Planning Corporation, Mass Shootings at Virginia Tech Addendum to the Report of the Review Panel, November 2009; Los Angeles World Airports, Active Shooter Incident and Resulting Airport Disruption—A Review of Response Operations, 18 March 2014.

38 The review panel consisted of: the senior executive agent in charge of the FBI's Active Shooter Initiative, a professional staff member from the FBI's Criminal Investigative Division, an FBI intelligence analyst, a lieutenant commander of the California Highway Patrol, and two members of the faculty and staff from Texas State University.

Appendix C:

INCIDENT LOCATIONS

The FBI identified 11 incident location categories, seeking to identify the primary location where the public was most at risk during an incident. For example, in 9 incidents, casualties occurred inside a private residence before a shooter moved to a more public area. In those incidents, the public area was identified as the primary location. In addition, some specialized business locations (i.e., malls and health care facilities) were separately identified.

DEFINITIONS OF LOCATION CATEGORIES:

Malls—Types of businesses typically consisting of more than one anchor store and many smaller businesses under a single roof, though they may include some open spaces. Strip malls, which typically provide no indoor open spaces and are often arranged in a single row, are included in the business category.

Businesses Open to Pedestrian Traffic—Private properties with the primary function of making, buying, or selling goods or providing services in exchange for money where pedestrian traffic is anticipated on a daily basis. Examples include restaurants, bars, law firms, theaters, grocery stores, private civic organization spaces, and event venues. This category does not include locations otherwise defined more exclusively in another category, such as malls or health care facilities, and institutions of higher education.

Businesses Closed to Pedestrian Traffic—Private properties primarily functioning in commerce without daily pedestrian traffic. Examples include manufacturing centers, packaging and distribution facilities and factories, warehouses, assembly plants, and commercial vehicle maintenance, storage, and repair facilities.

Schools—Public and private properties used for educating students from pre-kindergarten to 12th grade, as well as school administrative functions such as board and staff meetings.

Institutions of Higher Education—Public or private properties used for post-high school studies.

Other (Non-Military) Government Properties—Public properties owned by local, state, federal, or tribal governmental entities. Examples include courthouses, administrative buildings, and town halls. This category does not include locations otherwise defined more exclusively in another category such as military property or schools.

Open Spaces—Public or private properties openly accessible to the public. Incidents are categorized as occurring in open space if they take place primarily in an open air location rather than beginning or ending inside a building. Examples include incidents where the shooter is inside a moving car and incidents where the shooter acts while walking or running through public streets, open parking lots, or parks.

Military Properties—Public properties owned by the U.S. government and primarily reserved for the use of the U.S. military. Examples include military bases, airfields, sea ports, and training ranges.

Health Care Facilities—Public or private facilities that provide primary or secondary health services. Examples include hospitals, clinics, and urgent care, hospice care, and retirement facilities.

Houses of Worship—Public or private facilities used for religiously-sponsored activities at the time of an incident. This includes commercial properties used as houses of worship at the time of the incident. Examples include churches, temples, synagogues, mosques, and related religious gathering and retreat facilities.

Residences—Public or private single or multi-family places of residence.

Appendix C

Academic Access Control Upgrades to Main Campus

Summary Statistics:

Average access control upgrade cost per door leaf from PW651 (AH & BH Upgrade)	$8,350
Average replacement cost per door leaf from PW651 (AH & BH Upgrade)	$9,800
Average conversion cost per door - interior	$5,400

Exterior Access Control at Academic Buildings New Work

Bldg ID	Bldg Name	Access Status	Completed Doors	Prepped Doors	Untouched Doors	Access Door Count	Replace Door / Frame	MACC
CF	Communications Facility	Partial Prep	10	16	0	26	0	$217,100
CB	Morse Hall	Partial Prep	0	12	0	12	0	$100,200
BI	Biology Building	Partial Prep	0	14	0	14	0	$116,900
PH	Parks Hall	Partial Prep	4	0	10	14	0	$116,900
FI	Fine Arts	Partial Prep	0	4	10	14	0	$116,900
SL	SMATE	Partial Prep	0	25	0	25	0	$236,674
ET	Ross Engineering	Partial Prep	0	2	13	15	0	$125,250
PA	Performing Arts Center	Problem	0	0	40	40	6	$392,000
AA	Arts Annex	Needed	0	0	20	20	0	$167,000
CA	Canada House	needed	0	0	7	7	0	$58,450
CH	College Hall	Needed	0	0	7	7	0	$58,450
CM	Commissary	Needed	0	0	10	10	0	$83,500
ES	Environmental Studies	Needed	0	2	20	22	2	$215,600
FA	Fairhaven Academic	Needed	0	0	3	3	0	$25,050
HH	Haggard Hall	Needed	0	0	17	17	0	$141,950
HS	High Street Hall	Needed	0	0	13	13	0	$108,550
HU	Humanties	Needed	0	0	16	16	0	$133,600
OM	Old Main	Needed	0	0	26	26	0	$217,100
SP	Steam Plant	Needed	0	0	7	7	0	$58,450
WL	Wilson Library	Needed	0	0	17	17	0	$141,950
	Total		*14*		*311*	*325*		*$2,831,574*

Exterior Access Control at Academic Buildings Legacy Edwards Conversion for Lock Down Function

Bldg ID	Bldg Name	Access Status	Completed Doors	Prepped Doors	Untouched Doors	Access Door Count	Replace Door / Frame	MACC
MH	Miller Hall	Conversion	26	0	0	0	0	$12,000
AIC	AIC - East & West	Conversion	25	0	0	0	0	$12,000
CS	Campus Services	Conversion	7	0	0	0	0	$6,470
PP	Physical Plant	Conversion	10	0	0	0	0	$7,000
AC	Admin. Services	Conversion	6	0	0	0	0	$6,000
	Total		*74*		*0*	*0*		*$43,470*

Interior Doors

Interior Doors under Access Control		118 doors					$ 637,200
Interior door rekeying	$220/door	4,344 doors					$955,680

Total MACC

$4,467,924

Appendix D

JAY INSLEE
Governor

Policy Brief
September 2013

By setting clear goals and continually tracking results, the state will be better equipped to engage its employees, partners and the public in building a healthier, better-educated and more prosperous Washington.

www.results.wa.gov

Results Washington: A more efficient, effective and transparent state government

Any organization functions better — and gets better results — when its decisions and actions are guided by solid data. Washington has seen this firsthand. Over the past decade, for example, our data-driven "Target Zero" traffic safety program has helped reduce the state's fatality accident rate to record lows. Intensive data-gathering has helped us speed up our response to reports of child abuse and streamline delivery of government services, from water permit approvals to vehicle registration renewals. Now we're taking it to a new level.

Governor Inslee believes we can do more to ensure a faster, smarter and more accountable state government — a government focused on key goals that will help strengthen our economy, improve our schools and make Washington an ideal place to live and do business. By setting clear goals and continually tracking results, the state will be better equipped to engage its employees, partners and the public in building a healthier, better-educated and more prosperous Washington. Indeed, the Governor is delivering on his inaugural address promise that "We will provide efficiency, effectiveness and transparency."

Washington has long been a national leader in adapting proven private-sector methods and tools to measure and improve state government performance. For the past eight years, tools such as the Government Management Accountability and Performance (GMAP) program and Lean process improvement tools and techniques have been used to improve individual state agency performance.

The state is now poised to launch Results Washington, a new system combining the best aspects of GMAP with a significantly expanded Lean initiative that involves all state agencies. Results Washington will use the latest technology to routinely gather, review and display performance data which will make it easier for citizens to see for themselves how well state government and its many partners — such as school districts, local governments and community organizations — are delivering services and meeting key performance goals.

An innovative and data-driven approach to governing

Governor Inslee started this effort by identifying the vision, mission and top goal areas of his administration:

- World-Class Education
- Prosperous Economy
- Sustainable Energy and a Clean Environment
- Healthy and Safe Communities
- Efficient, Effective and Accountable Government

These goals tie into his "Building a Working Washington" agenda and encompass everything from transportation and education to health care and a clean environment. Goal councils, composed of agency directors, representatives from the Governor's budget and policy offices and the Results Washington team, were established for each goal area. The Results Washington team will work with agencies to gather and review performance data. This will provide valuable real-time information to help state managers spot trends and make data-driven decisions that will improve quality, speed up service delivery and support meeting improvement goals.

Access to an unprecedented array of performance data

Governor Inslee's goal councils identified key outcome measures and leading indicators for each of his five goal areas. These indicators require agencies to work together in developing strategic plans to meet the established goals. Results Washington will provide unprecedented transparency and access to information about how well we're making progress toward the goals. The goal councils, Results Washington team and Lean fellows will meet monthly to review performance data with the Governor, covering one goal area per month on a rotating basis. The data will be displayed and updated — with charts, graphs and context — on the Results Washington web portal.

Expanding state government's Lean initiative

Washington's businesses and health care industries have discovered the value of Lean as a way of doing business and achieved tremendous results. Lean is a system of proven principles, methods and tools that encourages employee creativity and problem solving. Lean is applied at all levels of an organization to review policies and procedures from a customer's point of view and consider what adds value and what can be eliminated. As part of Results Washington, we are creating a new Lean fellowship program, led by a Lean expert, to work side-by-side with agencies on performance improvement plans. Lean efforts will help state agencies more efficiently serve the people and businesses of Washington.

Engaging employees, partners and the public to deliver results

Previous state government performance management efforts typically measured only selected state agency outcomes. While Results Washington will continue to do that, it will also have a broader focus. Results Washington will use higher-level measures that gauge how well state government — and its public and private sectors partners — are doing. For example, one proposed outcome measure in the Prosperous Economy goal area is increasing the average wage for workers statewide. In the World-Class Education goal area, one proposed outcome measure is increasing the percentage of children enrolled in high-quality early learning programs.

Governor Inslee understands that state government alone cannot deliver success. By setting the vision and mission, and establishing clear expectations of continuous improvement against clear goals and targets to achieve, we will build a healthier, better-educated and more prosperous Washington.

"Let's get it done."

Appendix E

Western Washington University

DRAFT COMPREHENSIVE MASTER PLAN

Prepared by the Office of Facilities and Master Planning
Western Washington University
Bellingham, Washington

Guiding Principles (from the Draft Comprehensive Campus Master Plan, January 1997)

The following administrative principles shown below will guide future campus development:

1. The University Physical Master Plan reflects the University's strategic objectives in setting forth priorities in building and environmental projects
2. The preservation of the history and values inherent in the campus environment serves as the context for future growth and development of the University's campus
3. Provide convenient and safe access to and through the campus for the University's guests, faculty, staff and students
4. Future growth of the University occurs predominantly to the south
5. The central part of campus serves as the "academic core" of the University
6. The northern part of campus is primarily residential in nature

Appendix F

POLICY

Effective Date: September 1, 2015
Approved By: President Bruce Shepard

Authority: RCW 28B.35.120 SAAM Chapter 20 WAC 516-24-001

Cancels:	POL-U5610.01	Issuing and Using University Keys
See Also:	POL-U5346.03	Safeguarding University Assets
	POL-U5950.01	Health, Safety and Environmental Protection
	POL-U5400.01	Using University Resources
	POL-U5300.25	Reporting Loss of University Funds or Property

POL-U5710.01 MANAGING ACCESS TO UNIVERSITY FACILITIES

This policy applies to all faculty, staff, students, volunteers, guests or visitors who access University owned and leased facilities and space. Its purpose is to facilitate access to space and equipment by authorized individuals, to safeguard members of the Western Washington University community, and to minimize risk to both the University's property and the personal property of the individuals who work, study, and reside at Western.

Definitions:

Access Control – The means, methods and practices used to minimize risk to persons and property by regulating entry to buildings and spaces. Control activities may be preventative and/or detective.

Access Device – Any University-authorized device used to lock/unlock mechanical and electronic door hardware, including traditional metal keys, ID card, application and/or any other electronic means of access.

Area Access Manager – An Executive Officer, Chair, or Director of an academic or non-academic department designated to grant access privileges to individuals (i.e. faculty, staff, students, vendors and volunteers) for space over which they have been granted authority.

Access Control Administrator – A position designated to have operational oversight for access control to a defined grouping of buildings, facilities or spaces, and is responsible for determining operating hours.

Authorized Individual – An individual (i.e. University faculty, staff, student, volunteer or contractor) for whom certain access privileges have been granted by an Area Access Manager.

Departmental Key Controllers – Positions designated by an Area Access Manager to perform access administrative duties in accordance with University policies and procedures.

Sponsored Guest – A person who is present in a University building or space by way of an Authorized Individual.

POLICY

1. Vice President for Business and Financial Affairs Ensures an Appropriate and Effective Access Control Management Process is Established

The Vice President for Business and Financial Affairs (VP for BFA) will ensure physical access processes:

a) Are implemented and maintained,

b) Are compliant with other University policies, and

c) Minimize risk to the campus community and its property.

The VP for BFA appoints members of the Campus Access Control Committee (CACC) and approves its charter.

2. Campus Access Control Committee Oversees Access Control

The CACC is a standing committee with the responsibility to:

a) Designate Access Control Administrators (ACA) for campus spaces

b) Develop and maintain guiding documents;

c) Advise vice presidents on access control issues within their divisions

d) Advise ACAs in the development of processes for requesting and granting access devices within their areas of responsibility; and

e) Interpret this policy to resolve individual disputes and address questions pertaining to access control.

3. Area Control Authorities Define the Process for Requesting and Granting Access Devices

ACAs designate Area Access Managers (AAM) for areas and spaces assigned by the CACC.

The specific process for requesting, and the criteria used for granting access and access devices, is defined by the ACA in accordance with campus guiding documents and divisional guidance. The following underlying principles apply:

a) Employment status does not imply automatic authorization for access,

b) Access is granted at the lowest level of need, and

c) Granting access is to always favor safety and security of persons and property over the convenience of the requester.

AAMs may only grant access privileges within the parameters established by an ACA, and only for the areas assigned by the ACA.

4. Guiding Documents

Guiding documents are an extension of this policy. The CAAC, ACAs, AAMs, and Authorized Individuals are required to follow approved guidelines in order to effectively manage access to University facilities. Guiding documents will include, but are not limited to:

a) Guidelines for Issuing Access Devices - Describes levels of access and criteria for granting access privileges and access devices to authorized individuals.

b) Identification of ACAs and AAMs and departmental responsibilities for access control.

c) Access Control Measures - Describes risk and vulnerability considerations when determining the preventive and detective measures that will be used by the University for access to areas on campus.

5. Access to All University Owned and Leased Facilities and Space Is Limited to Authorized Individuals

a) During scheduled hours, academic and administrative buildings and spaces are open for general use by employees, students, and the public for educational, work related, and special event purposes.

b) Outside scheduled hours, access is restricted to authorized individuals. Sponsored guests must be accompanied at all times by an authorized individual.

c) During all hours:

i. Access to certain University areas is limited to authorized individuals only. For example:

1) Operational facilities and spaces (e.g. steam plant and mechanical rooms).

2) Higher-risk facilities and spaces (e.g. laboratories, hazardous materials storage areas, and performance venues).

ii. Access to residential facilities is limited to authorized:

1) Students,

2) Guests of students,

3) Employees,

4) Visitors (e.g. pre-authorized conference attendees), and

5) Contractors.

6. Visitors, Students and Employees Must Comply with University Conduct Regulations

In addition to employees and students, guests, contractors and visitors on University property are expected to comply with all University policies and state and federal regulations related to:

a) Access to and use of University buildings and spaces, and

b) Appropriate conduct as described in WAC 516-24.

7. All Access Devices Are the Property of Western Washington University

a) Access devices and privileges are assigned to authorized individuals on a temporary basis only,

b) Authorized individuals must sign for the access device, indicating they understand and will comply with individual rules and responsibilities for access devices,

c) Supervisors of authorized individuals must ensure access devices are promptly returned or relinquished to the original issuer:

i. When no longer needed for any reason,

ii. Before departing the University or transferring to another department, or

iii. Upon request for any reason at any time by an Executive Officer, Access Control Administrator, Area Access Manager, Supervisor, or Director of Public Safety.

d) Failure to return access devices by an authorized individual may result in one or more of the following:

i. Administrative action by the University, up to and including legal action, and/or,

ii. Assessment of charges for expenses incurred by the University to return access control to the same level that it was before it was compromised by the individual's failure to return the access device.

e) Lost, stolen, or damaged access devices shall be reported immediately to the:

i. Appropriate Access Control Administrator,

ii. Area Access Manager, and

iii. University Police Department.

The *Reporting Loss of University Funds or Property* (POL-U5300.25) policy is to be followed when any known or suspected loss resulting in the unauthorized taking of University public or non-public funds or property or other illegal activity.

8. Authorized Individuals Responsible for Safekeeping Access Devices and Appropriate Use of Spaces

Authorized individuals who are assigned an access device are prohibited from:

a) Loaning access devices to others,

b) Transferring access devices to others,

c) Duplicating access devices,

d) Altering access devices or access control mechanisms,

e) Damaging, tampering, or vandalizing any University access control mechanism,

f) Propping locked doors open, and

g) Admitting unauthorized individual(s) into an access controlled space.

9. Director of Public Safety Ensures Audits of Issued Access Control Devices

The Director of Public Safety may independently conduct periodic audits of issued access control devices or may request that Access Control Administrators and Area Access Managers conduct audits of the area(s) for which they have oversight.

Appendix G

TRUSYS

WESTERN WASHINGTON UNIVERSITY

ACCESS CONTROL SYSTEM ROADMAP

Dave Miller, Principal, TRUSYS

March 15, 2013

CONTENTS

EXECUTIVE SUMMARY

Western Washington University (WWU) has contracted **TRUSYS** to provide a Roadmap detailing how to move forward with the implementation of the replacement for the Access Control System (ACS) at WWU.

ISSUE

The WWU process to date has created an impasse between two different approaches. The first approach advocates an immediate upgrade of the system due to funds being available in this biennium.

The other approach is to defer the replacement of the system as long as possible until it is no longer supported by the manufacturer. This approach is advocated by some within WWU so that badly needed capital dollars can be deferred for other projects as long as possible.

The need for replacing the ACS has been brought on by the following:

1. The need for distributed administrative control of the access control due to the inability to address it through staffing.
2. The pending "end of life" declaration that will be issued for the access control portion of the integrated EST system, and the future roll-out of the EST-4 which will make the access control portion of the system obsolete.

RECOMMENDATION

The key points to **TRUSYS**' recommendation are:

- Defer Replacement of the ACS for two to three years.
- Cease investment in current ACS
- Implement a 5-Point Roadmap for replacement of the Access Control System.

The 5-Points of the Roadmap are:

1. Define Requirements
2. Assess Feasibility & Costs
3. Plan and Design System Replacement
4. Procurement and Implementation
5. Operation of System

By following this Roadmap, WWU can achieve an access control system that can meet their growing needs and expectations, and that can be incorporated into their overall Security Plan.

ROADMAP

EXISTING SYSTEM

The existing ACS can continue to meet WWU's basic needs for the next two to three years. It is recommended that investment in customizing the EST ACS be stopped due to the following considerations:

- Creating the ACDB into a custom software application that is only understood by a limited number of people at WWU could be highly disruptive and expensive if WWU can no longer support the ACDB internally.
- Outside vendors may, or may not, be able to support a customized system.
- The cost in customization of ACDB would only bring it to what most ACS manufacturers offer today which makes the Return on Investment (ROI) questionable.

TRUSYS recommends that a moratorium be placed on any additions or modifications to the EST-3 Synergy access control system with the following exceptions:

1. New construction with exterior doors and audio/visual components that require monitoring. Where interior access control doors and intrusion detection are desired, a Risk Assessment should be provided to determine the risk associated, and the Assessment determines an immediate need for Security Technology. Infrastructure such as boxes, conduit stub-outs, conduit runs, and pull strings should be provided for the future devices.
2. Remodeled space that meets the criteria in Item 1 of this list.
3. Other spaces where a Risk Assessment determines an immediate need for Security Technology.

If more detailed information about the existing ACS is required, please refer to Appendix A.

5-POINT ROADMAP

TRUSYS recommends a 5-Point Roadmap to obtain an upgraded and operational access control system.

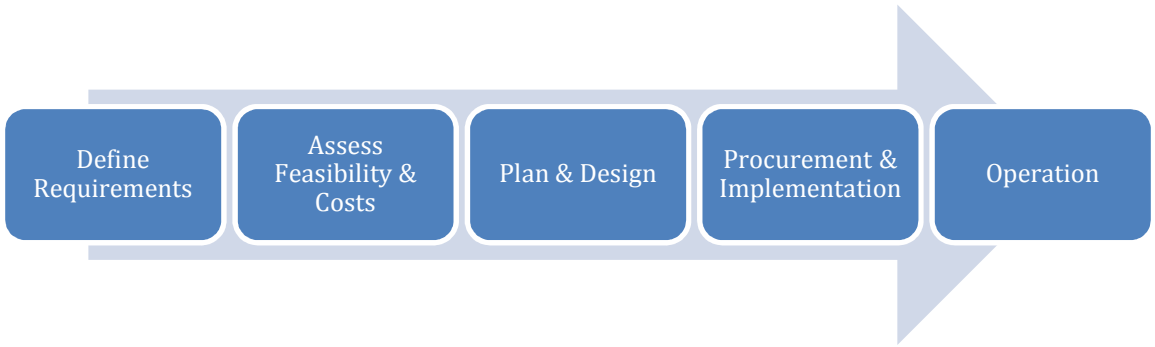


Figure 1 - 5-Point Roadmap

DEFINE REQUIREMENTS

The definition of requirements should be based on two levels:

1. The overall Security Plan and how the ACS will be integrated with other security technologies.
2. The technical requirements of the Access Control System.

SECURTY PLAN

A Security Plan that encompasses all aspects of security at WWU will be defined. It would assess key aspects such as:

Figure 2 - Security Plan

Commentary on a Security Plan can be found in Appendix C.

ACCESS CONTROL TECHNOLOGY

Technology issues that require definition for the new ACS are:

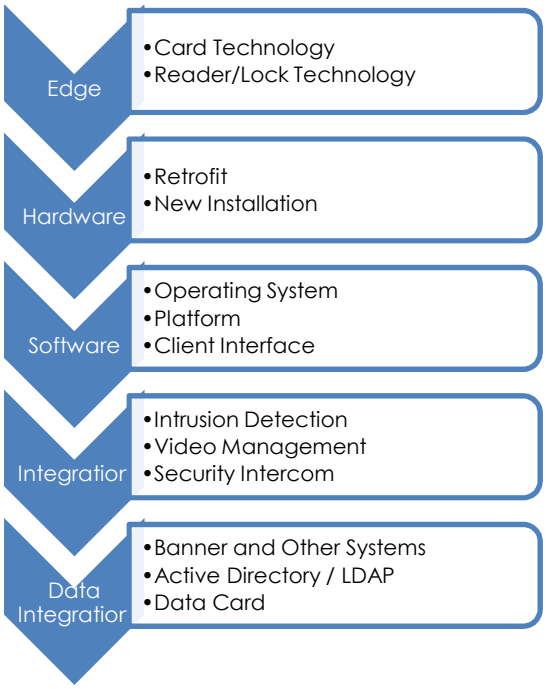


Figure 3 - Defining ACS Requirements

Commentary on current Security Technology can be found in Appendix B.

ASSESS FEASIBILITY & COSTS

Using the Requirements that are developed for the Security Plan and Access Control, the various avenues that are available for implementation should be evaluated for their feasibility and costs. Examples of these approaches include:

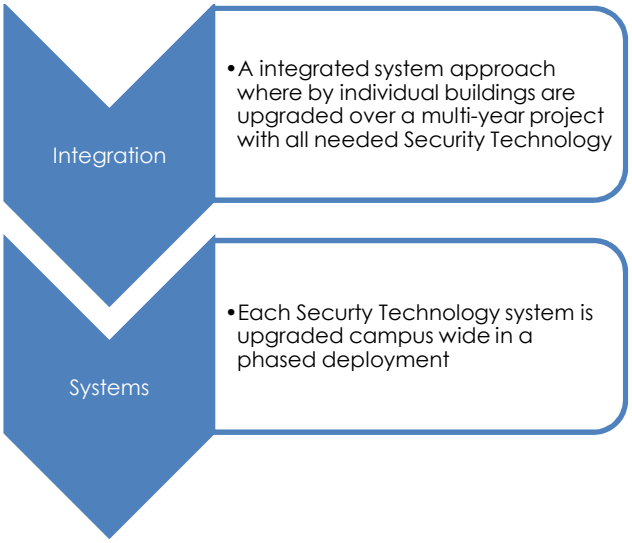


Figure 4 - Example Approaches

Each approach should be evaluated based on costs and impact to existing systems and operations.

PLAN & DESIGN

WWU should quantify the desired approach into a systematic plan that incorporates the defined requirements.

This stage will have deliverables such as:

Tasks	Tasks
Manufacturer Selection	Cards, Card Readers & Reader/Locks Control Hardware Software
System Plans	Detailed, Shop Drawing Level
Specifications	Specific to Project, Integrated with Plans
Budget Estimates	Detailed, Based on Specified System(s)

Figure 5 – Plan & Design

PROCUREMENT & INSTALLATION

Based upon the approach to be taken, the system(s) will be Procured and Implemented. Using accepted project management practices, the implementation process will be tightly controlled to ensure that the specified solution is installed.

System commissioning will be a major focus, which will lead to system acceptance by WWU.

OPERATION

Following system acceptance by WWU, the new technology will be used in a manner that supports the overall Security Plan for WWU.

ALTERNATIVE

If it is determined that the budgeted funds from the current biennium for the replacement of the Access Control System will be lost if no action is taken, then the following should be done:

1. Engage a consultant to specify and design a new ACS system which would include at a minimum:
   a. Determination of the optimum solution for smart card technology, readers and integrated reader/locks, or if the use of Proximity technologies be maintained.
   b. Determination of a hardware manufacturer that has the broadest range of ACS hardware that can support the chosen technologies.
   c. Qualify and select an ACS manufacturer who can provide the technology solution determined in Items 1 and 2 above.
2. Design and specify the system upgrade.
3. Receive quotations from authorized resellers of the ACS manufacturer selected in Item 1 above.

Development of a Security Plan including future Security Technology updates and integration should be done, following the recommended 5-Point Roadmap.

SUMMARY

By deferring for 24 to 36 months, the replacement of the Access Control System, Western Washington University can assure itself of enough time to implement the 5-Point Roadmap so that a cohesive and well thought out Security Plan and Security Technology Plan can be implemented.

BUDGETS

Both low and high budgets have been prepared and the Tables below summarize the differences and provide the assumptions that have been made.

The Consultant Design Fees quoted are based on a detailed design that would be created, and would effectively eliminate the need for shop drawings to be submitted by the contractor.

ACCESS CONTROL SYSTEM

Assumption	Low	High
Quantity of ACS Panels	32: Replaces only those panels that have existing ACS doors at this time.	59: Replaces all SAC-3 cards in existing FACP with new ACS control panel.
ACS Panel Location	Assumes that new ACS panel will be located in the same room as the existing EST panel.	Assumes that new ACS panel will be located in the same room as the existing EST panel.
Upgrades HID Prox to Smart Card Reader (Dual Tech)	212	212
Wireless Access Points	13: Provides wireless access points for conversion of 54 stand-alone reader/lock combinations.	13: Provides wireless access points for conversion of 54 stand-alone reader/lock combinations.
Upgrade of older style Stand-Alone reader/locks to Wireless	44	54
Convert AD-200 to AD-400	10	0
New RS-485 wiring for door modules	150' average per existing door.	300' average per existing door.
Software	1 Server License 320 Door Reader Licenses 2 Thick Client Stations 10 Concurrent Thin Client Stations 3 Data Base Integration Licenses	1 Server License 320 Door Reader Licenses 2 Thick Client Stations 10 Concurrent Thin Client Stations 3 Data Base Integration Licenses
System Budgetary Estimate:	$832,000	$1,143,000
Software Support	$6,000/year based on parameters indicated.	$6,667/year based on parameters indicated.
Consultant Design Fee	$149,640	$205,632

Budgetary Estimate Table 1: ACS

Savings can be obtained if it is determined that the existing RS-485 wiring can be used in lieu of providing new wiring.

INTRUSION DETECTION SYSTEM

Instead of trying to determine how much new wiring would be required from a single intrusion detection system (IDS) panel to the various devices and RCC-7s in each building, the approach of installing a minimum of one (1) IDS panel per building or 1 per RCC-7 where there are multiple locations in a building has been applied.

Assumption	Low	High
Quantity of IDS Panels	79: Assumes that where only 1 IDS point is indicated on the inventory, that it could be monitored by ACS.	88: When IDS devices are indicated, provides a minimum of one per building, or one per RCC-7 location.
IDS Panel Location	Typically RCC-7 location or central location such as MDF/IDF.	Typically RCC-7 location or central location such as MDF/IDF.
New wiring for devices & keypads	125' average per existing device or keypad.	200' average per existing device or keypad.
Software	1 Integration License per IDS Panel.	1 Integration License per IDS Panel.
Existing Devices	Assumes that all existing devices can be re-used.	Assumes that all existing devices can be re-used.
System Budgetary Estimate:	$510,645	$568,220
Consultant Design Fee	$91,916	$102,280

Budgetary Estimate Table 2: IDS

Savings can be obtained if it is determined that when a building has a small amount of devices, i.e. 1 to 10, that they can be re-wired to the ACS system controller which will have this capacity.

VIDEO MANAGEMENT SYSTEM

Assumption	Low	High
Quantity of Servers	2	2
Storage Capacity	24 TB	24 TB
Cameras	Use existing cameras with video encoders to convert analog to IP signal.	Install new IP cameras with new CAT 6 cabling to each camera.
Software Licensing	Assumes 1 license per camera for integration with ACS.	Assumes 2 licenses per camera (1 ACS/1 VMS) for integration with ACS.
System Budgetary Estimate:	$149,616	$321,660
Software Support	$1,870/year based on parameters indicated.	$4,194/year based on parameters indicated.
Consultant Design Fee	$26,931	$57,899

Budgetary Estimate Table 3: VMS

OTHER SERVICES

There are other recommended services that are not included with the Consultant Design Fees noted above.

ROADMAP PONTS 1 & 2

The above Consultant Design Fees do not include the first two points on the 5-Point Roadmap:

- Define Requirements
- Assess Feasibility & Costs

A budget range of $16,000 to $32,000 is suggested for this depending on the scope of services to be provided by a consultant. This does not include travel expenses which would likely run at 15% to 20% of the fee.

MANUFACTURER SELECTION PROCESS

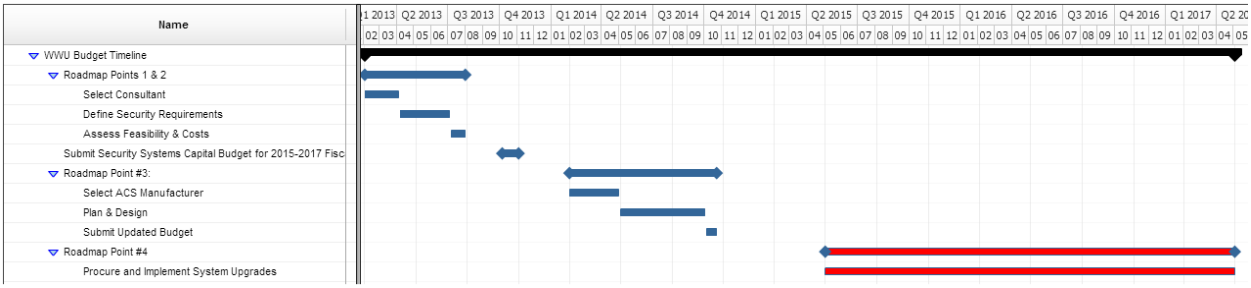
The detailed selection process for determining card technology, reader/lock technology, hardware, and system software is not included with the Consultant Design Fees noted above.

A budget range of $13,000 to $19,000 is suggested for this depending on the scope of services to be provided by a consultant. This does not include travel expenses which would likely run at 15% to 20% of the fee.

BUDGETARY TIMELINE

The following timeline is based upon the following assumptions:

1. That WWU will be able to find funding for Road Map Points 1 & 2, and Manufacturer Selection in 2013.
2. Funding for system design can occur in the 2nd half of 2014.
3. Funding for system replacements can occur in 2015/2017 biennium.



Budgetary Estimate Figure 1: Timeline

A larger view of this timeline is added at the end of the report.

PERSONNEL

TRUSYS has been asked to provide manpower recommendations for two aspects of the systems at WWU.

DISPATCH

Currently dispatch is operating with five (5) full time dispatchers for a 24/7 operation with no supervisor currently in place. The following, based on a discussion with Chief Randy Stegmeier, the following is considered the optimum personnel needed.

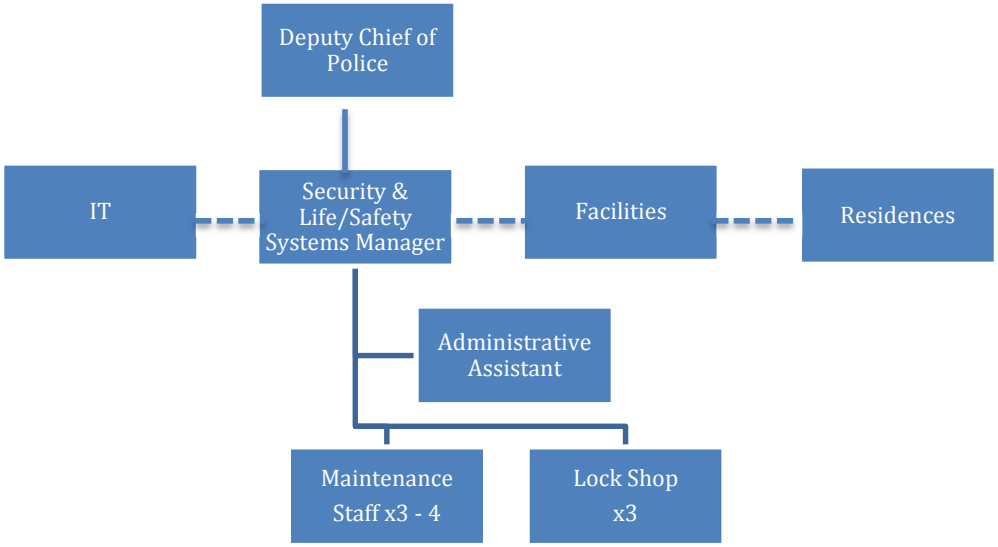
- 1 – Supervisor: The Supervisor will have the additional duties of covering sick or unexpectedly absent dispatchers, and to be the Terminal Agency Coordinator.
- 6 – Dispatchers: This will allow normal eight (8) hour shift coverage and minimize overtime. The Chief expressed a desire to have shifts maintained for a six (6) month duration, and then rotation can occur.
- 2 – Part Time Dispatchers: These are envisioned to be on call dispatchers to cover sickness and unexpected absences or short-term planned absences such as vacations. They are envisioned to be eligible for up to 16-hours per person per month, unless covering for a longer term duration such as a maternity leave.

SYSTEM OPERATIONS

Upon systems being installed, including fire alarm and mass notification, they become tools for dispatchers to be notified of conditions that affect the health, safety and welfare of the students, faculty and staff at WWU. Under this premise, it would make sense that the same entity that has authority over the dispatchers would have the ability to control the systems including their maintenance.

The Organizational Chart shown below has been provided with this in mind. The Systems Manager would have bilateral relationships with counterparts in IT, Facilities, and Residence Halls.

The Systems Manager would be the stakeholder representative for systems during capital project planning and implementation to ensure that collaboratively published system design requirements are adhered to, and that these systems are not compromised due to "value engineering".



Budgetary Estimate Figure 2: Systems Team

There are not to **TRUSYS**' knowledge, published standards or metrics for how many personnel are required for the maintenance and ongoing support of security systems.

SYSTEMS MAINTENANCE

The current maintenance of two (2) seems to be low, and does not allow for coverage of the campus should one of the two need to take an extended absence. WWU has begun to address this by training more personnel. The team should be able to be more efficient in maintaining the combined fire/life safety systems and security systems if one or two full time employees are added to this segment of the systems team.

LOCK SHOP

With the administration of the system moved to the System Manager and the Administrative Assistant, the Lock Shop should be able to fully focus on its purpose of lock maintenance and repair, issuing of "brass keys" and rekeying of locks.

The existing staff of three (3) should be sufficient for this task.

SUMMARY

The following are the budgetary estimates by system, and for the consultant cost by Roadmap point. Where we have felt that clarification was needed in the parts of the Roadmap Point, we have indicated the cost associated with the part.

System	Low	High
Access Control	$ 832,000	$1,143,000
Intrusion Detection	$ 510,645	$ 568,220
Video Management	$ 149,616	$ 321,660
Systems Costs Total	$1,492,261	$2,032,880

Budgetary Estimate Table 4: Systems Budget Summary

System	Low	High	Timeline
Roadmap Points 1 & 2 Define Requirements & Feasibility/Costs	$ 16,000	$ 32,000	April 2013 – Sept. 2013
Roadmap Point 3	$201,365	$291,358	April 2014 – Dec. 2014
Select ACS Manufacturer	$ 13,000	$ 19,000	April 2014 – June 2014
Design & Specification (All Systems)	$201,365	$272,358	July 2014 – Dec. 2014
Roadmap Point 4 (All Systems) Procurement & Implementation	$ 67,122	$ 91,453	July 2015 – June 2017
Total Consultant Budget	$284,487	$414,811	

Budgetary Estimate Table 5: Systems Budget Summary

Note: Consultant fee does not include travel expenses which typically be estimated at an average of 15% of the fee amount.

APPENDIX A - EXISTING SYSTEM: EST-3 SYNERGY

CONFIGURATION & SOFTWARE

The existing access control system (ACS) is an integrated component of the EST-3 fire alarm system. The security portion of the system, trade named as Synergy, has been in the market place since the early 2000's.

EST has gone through two (2) corporate buyouts, and since 2005 EST has been directed by corporate not to upgrade and improve the system technology as it is considered to be a competing product with several security product lines within GE and UTC.

- GE Security Purchases EST in 2005
- UTC Purchases GE Security in 2010

The ACDB while "state of the art" at the time of its release in the early 2000's has seen little development since its initial offering. The ACDB uses Delphi with JET engine as the data base language which is not commonly used in the development of data base applications today. Discussions have occurred between EST and WWU, where WWU would be given the source code for the ACDB, and have the ability to modify the ACDB for improvements that are deemed necessary. EST would be released from all liability associated with the source code being provided, and would only be obligated to support WWU should EST adopt any of the changes for their product offering. Based on previous history, it appears unlikely that EST would adopt these modifications.

EST has clearly stated that while a defined end-of-life date has not yet been published, that the ACS will in the near term of 2 to 3 years likely not be supported. The SAC-3 communications card and the CRC modules have been on the discontinued products price list for several years, but these parts are available with up to a two (2) week lead time.

The ACS is accessed and programmed via a separate ACDB server from the Fireworks stations. The Lock Shop manages card holders and credentials on the ACDB via a client station and communicates via modem to the respective panels.

The system panels are currently networked across a dedicated multi-mode fiber optic network. This network allows the EST-3 Synergy (fire alarm, mass notification, and security components) to be networked using TCP/IP. The "ring" topology of the fiber optic network makes it highly resilient.

Where ACS is currently installed within a building on the campus, the security system resides on the EST system using one of two formats:

- SAC-3 using RS-485: Keypads and Card Reader Controller (CRC)
- Addressable SLC: Security Devices; i.e. door contacts, motion sensors, audio/visual (A/V) alarms, via input modules

The CRC modules currently support HID Corporate 1000 Proximity technology card readers. With the exception of the CRC module all door devices and components could be retrofitted into a new system.

EXISTING IDS

The existing IDS is an integral part of the EST-3 Synergy system. The system is comprised of centrally located zone modules and distributed zone modules. In some cases, the

same area of the building might be served by both centrally located zones and distributed zones.

The centrally located zones located in RCC-7 enclosures in MDF and IDF rooms are relatively easily upgraded.

The field located security devices are not as easily upgraded to a new system infrastructure as they can reside on the same circuit as fire alarm devices.

Keypads will likely need to be rewired when the RS-485 circuit is taken over by the new access control system.

CREDENTIAL SYSTEMS

For the purpose of this report, a credential is any method that allows an authorized user access via a door into a building or space.

The vast majority of credentials issued at WWU are "brass keys". Keys are issued either via the Lock Shop which reports to the WWU Campus Police Chief or via the resident hall management system using their in-house developed "Keys" database.

When resident dormitory room keys have been lost, and not recovered within a predetermined time period, residence management notifies the Lock Shop of the need to rekey the affected door(s) and issue new keys.

Access control "cards" in the form of actual cards or fobs are issued on an as needed basis via the Lock Shop. WWU ID cards are not currently integrated with an access control card.

The "cards" are used to access three (3) different access control systems on the campus. The majority of card readers are on the EST-3 Synergy system with approximately 165 readers currently in use.

The other two systems are "stand-alone" door readers which must be programmed into a software program and then upload via a handheld device. The older stand-alone system is being phased out in lieu of the Schlage AD-200 system. The AD-200 integrated locksets have the capability to be upgraded from a stand-alone product to a 900 MHz wireless network product or to a Wiegand product using an RS-485 protocol. There are 46 stand-alone readers at WWU today.

INTEGRATION OF INTRUSION & VIDEO

The integration of intrusion detection system (IDS) is well integrated with the ACS on the EST-3 platform.

The integration of video is not well integrated with the EST-3 Synergy. Dispatch personnel were only able to identify five (5) cameras that could be viewed on alarm conditions from the EST-3 system.

The campus cameras are displayed on a single monitor in Dispatch. Dispatchers are not able to view camera thumbnails in full displayed view. In Dispatch there is no control of pan/tilt/zoom (PTZ) cameras on Campus.

Recorded video cannot be viewed from Dispatch.

SECURITY TECHNOLOGY PLAN

TRUSYS found that Security Technologies at WWU have been implemented as budgets and personnel have been available over the last 10-15 years and there has not been a Security Plan guiding implementation.

For example, there are numerous and disparate systems in Police Dispatch where the primary dispatcher's location has nine (9) "systems" that can provide "alarm" data and that requires observation or require interface by the dispatcher:

1. Emergency Phones
2. Web MSS (Runs license plates and driver licenses, but not the same system as in the officers' cars.)
3. ARMS – CAD and Incident Reporting
4. Voice Recording System
5. "Access Systems" for arming/disarming intrusion area when called on phone by occupant.
6. Aiphone – Audio/video system for access to the Campus Police building.
7. Fireworks – Fire and Security Annunciation of alarms.
8. HVAC Alarms – Operated for two weeks during summer leave period.
9. Video (CCTV) Camera Monitor (see notes above on integration)

In addition to the systems noted above, the dispatchers are tasked with answering the following audio systems or components:

1. Safe Phone (650-SAFE)
2. Primary Phone (3555 – non-emergency, 3911 – emergency)
3. Primary Phone (duplicate for when audio recording is required)
4. Emergency Call System Radio
5. Primary Police Radio desktop and portable
6. Parking Radio
7. Hard Line Phone (off campus)
8. TTY
9. Aiphone

Security Technology must work in a cohesive manner that allows the University's first responders to support those in need, and to create a document trail for incident response and reporting.

PERSONNEL & BUDGETS

The existing ACS is maintained by the "fire alarm shop". This two person team, David Holmwood and Lane Weaver, are exceptionally talented. They have developed capabilities on the EST-3 network that have been adopted by EST for the product line. This team reports to Facilities Management - Operations.

The Lock Shop is supervised by Kevin Conforti, and the administration of the card databases is performed by Ethan Van Diest. It reports directly to the WWU Chief of Police.

TRUSYS found three (3) common constraints during interviews with all stakeholders.

1. Funding is insufficient to support the work required to maintain the existing ACS.

2. There is uncertainty of the ability to obtain funding for a new and expanded ACS.
3. There is not a single person accountable and responsible for the maintenance and operation of the ACS; and who has the authority to make daily operational decisions using a prescribed standard of operation.

These opinions are not specific only to those personnel noted above, but was a general theme voiced by all that were interviewed.

APPENDIX B - SECURITY TECHNOLOGY IN THE MARKET TODAY

This section will provide a brief update on Video Management Systems (VMS), ACS Best Practices, and System Integration. These comments are based on **TRUSYS**' experience.

VIDEO MANAGEMENT SYSTEM (VMS)

VMS, formerly called CCTV, is the fastest growing area in the security industry. The use of megapixel IP-based cameras is driving this growth. Camera manufacturers are focused on creating better resolution by pairing higher quality lenses with ever increasing megapixel sensors.

To counter ever increasing resource demand on Network Video Recorder (NVR) processor bandwidth and storage requirements, the following trends have been identified:

- Movement to "Edge" processing of camera analytics. Cameras are now built with sufficient processing power to determine if there is a rules based need to have the video images recorded at the VMS and to alert monitoring personnel.
- Many cameras now have a built in ability to record video images to an SD card; thus allowing onboard storage for later upload to the VMS during off-peak transmission periods.
- Use of H.264 video format instead of MPEG and MPEG4.

There is a growing trend to use "purpose-built" servers and storage devices to run the VMS software and to store video. These manufacturers have partnered with VMS manufacturers to certify the manufacturers' VMS software on their purpose-built hardware solutions. **TRUSYS** recommends this approach as a best practice versus using commercial, off the shelf (COTS) solutions such as Dell, IBM and HP.

Two key areas that continue to require development are:

1. The ability to provide "backup" power to cameras and recording systems so that they can continue to operate during the loss of primary power.
2. The ability of high megapixel cameras to work in low and adverse light conditions.

ACCESS CONTROL BEST PRACTICES

CONCEPT

The best "Best Practice" that a client can implement is to create a Security Technology Plan (STP) that can be replicated. The STP should be part of the documented Security Plan, and should be made available to the contracted design team each time a new building or remodel is to be undertaken.

The use of an STP will minimize the cost of designing additions to the ACS, and provide savings for the maintenance of the system by minimizing the spare parts that should be maintained on site.

The SDS can minimize the impact of operating the system as well. A strong and resolute STP can ensure that items such as IDS keypads are included for areas where arming and disarming of the IDS is required, instead of allowing it to be "value engineered" (VE) out of the design. This VE has occurred at WWU, and areas are now armed & disarmed over the phone with the Campus Police Dispatch.

The STP should take into consideration the following:

1. Cost of Installation
2. Cost of Maintenance
3. Capabilities of Internal Resources
4. Capabilities of External Resource

By developing and adhering to a Security Technology Plan, each client can develop their own "best practices", because what is best for one owner may not work for the next owner.

Practical Application

TRUSYS has broken ACS Best Practices into two levels, Tactical and Strategic.

Tactical level best practices are those that can be ascribed to such issues as power supply configurations and mounting configurations of various door components. These are considerations that can be left to the design stage of the project.

Strategic level best practices are those that impact the overall operation of the system or dictate how the infrastructure will be placed within a building. It is these Strategic considerations that must be customized to each individual client's needs.

The best consensus in the industry today, is that there is no consensus. This can best be exemplified that for access control (and security in general) that unlike fire alarm systems, there are not Codes and Standards which dictate when to install these systems, and more importantly, how they shall be installed.

The following are examples of where accepted best practices are being challenged:

1. Centrally Located Control Hardware:
   A common practice has been to locate ACS control hardware and power supplies in a central location for an entire building, or for larger buildings in multiple locations. These configurations typically consisted of a custom enclosure for housing the ACS modules and power supplies for powering electronics and door locks. Often times a 4' x 8' space would have to be dedicated in the room where the equipment was to be located.
   New technology such as IP-based door controllers and integrated wireless and Wi-Fi reader/locks have begun to financially incentivize clients to move to a "distributed" technology format, and also minimize the centrally located space that is needed.
   In the case the one **TRUSYS** client, they chose to remain with a central configuration that required a very expensive two-door, 4' x 5' enclosure with redundant levels of power supplies and that required cooling fans due to heat generation. This was the best practice adopted by the client based on their risk and cost assessment.
2. Wire Exterior Doors
   It has been a commonly accepted practice since the inception of wireless communication technologies to only have wired doors on the exterior of a building. This was due to the long lag times for the wireless technology to achieve lockdown from a central command input.

   Advances in battery efficiency coupled with better technology now have wireless technology that can achieve lockdown in 10 seconds. Is the 10 second

window an acceptable risk to the client? Is the cost savings that can be achieved using this technology worth the potential risk of doors being delayed for locking on demand? The greater frequency of "handshake" between the wireless device and the system will have an impact on the device's battery life, thus an impact to operating cost.

WWU will likely continue to be challenged with budgets for the foreseeable future, and it is highly recommended that they review options like the above examples to determine their own best practices that balance cost vs. risk.

BEST PRACTICES RECOMMENDATION

TRUSYS recommends that WWU create a Security Plan with an integral component being the Security Technology Plan for the University. The process of creating an encompassing Security Plan will create the best practices that will be prescribed by WWU.

INTERIM BEST PRACTICES

What should WWU do with the wiring infrastructure where ACS and IDS have to be added to the EST system in the interim period while the Security Plan is created and the new ACS is selected and installed?

RECOMMENDATIONS

1. Wiring from the EST Panel to the door for the CRC module:
   - Use the required unshielded, twisted – low capacitance cable required for the SAC-3 RS-485 circuit.
   - Future Wiring:
     - Provide a shielded, twisted 4-conductor cable
     - Consider the option of "home-running" one or two CAT-6 cables from each CRC to the EST-3 panel or to an MDF/IDF as a "future or spare".
2. Place keypads on a separate extension of the SAC-3 RS-485.
3. Do not mix security monitor modules on the same addressable loop as fire alarm devices.
4. Home run all security field devices such as door contacts, motion sensors, glass break sensors, etc… back to the RCC-7 locations. Do not use field located monitor modules for security purposes.

SYSTEM INTEGRATION

In the market place today, Access Control System (ACS) is the system around which security system integration is achieved. Many ACS manufacturers realize that they do not have the ability to design, develop and manufacturer all the needed systems such as intrusion detection (IDS), video management (VMS), and security intercom (SIS). Instead they turn to manufacturers of these systems and create partnerships.

The primary method of integration between each of these systems and the ACS is via TCP/IP network technology. To ensure interoperability between these systems, many ACS manufacturers offer their partners certification programs; thereby ensuring that as new versions of software are rolled out, the systems will continue to operate.

When considering an integrated system, the selection of an ACS manufacturer who has multiple partners is highly desired.

RECOMMENDATION

The following are the Milestones that **TRUSYS** recommends for achieving the desired integration:

Figure 2: Recommended Milestones

Integration of the ACS with Banner, Data Card and the Event and Conference management systems can be accomplished using WWU's in-house resources, unless the ACS manufacturer has a "canned" integration that can be deployed effectively and efficiently.

TECHNOLOGY RECOMMENDATIONS

The following 3-step process should be adhered to regardless of whether the 5-Point Roadmap is used or the ACS is replaced immediately:

1. Determination of the optimum solution for smart card technology, readers and integrated reader/locks.
2. Determination of a hardware manufacturer that has the broadest range of ACS hardware that can support the chosen technologies.

3. Qualify and select an ACS manufacturer who can provide the technology solution determined in Items 1 and 2 above.

EDGE TECHNOLOGY

WWU should create a Request for Information to select the manufacturers who should be interviewed for their Smart Card and reader and integrated reader/lock technologies. Based on these interviews, a single source technology should be chosen for the Control Hardware selection.

CARD TECHNOLOGY

TRUSYS recommends that "Smart Card" technology be adopted at WWU. This will allow future upgrades of systems such as Dining, the Library, printing, etc… to leverage the existing Smart Card technology when they are migrated away from bar codes scanners and mag stripe readers. Most importantly, it will allow WWU to be proactive should WTA convert in the next few years to an ISO 14443 Compliant Application.

INTEGRATED READER/LOCK TECHNOLOGY

WWU should use Integrated Reader/Lock technology for the following applications:

- Exterior Doors where an ADA Door Operator will not be installed. These should be a wired, not a wireless or Wi-Fi configuration unless a delay in activation of a lock down is acceptable.
- Interior Doors as follows:
  - Doors behind which critical assets are maintained and managed or where instantaneous Lock Down is required: These should be a wired, not a wireless or Wi-Fi configuration unless a delay in activation of a lock down is acceptable.
  - All other interior doors: Wireless or Wi-Fi Configurations.

  Note: A Wi-Fi solution will be able to leverage WWU's existing Wi-Fi infrastructure if a VLAN can be created on that infrastructure and the system can be encrypted at 128-AES or higher to prevent hacking.

  A wireless solution of either 900 MHz or 2.4 GHz will require an additional infrastructure of wireless access points, but the technology is being directed to respond to a lock down signal within 10 seconds of activation. Faster response times are anticipated in the future.

CONTROL HARDWARE

WWU should select an ACS control hardware solution that works with the smart card reader and integrated smart card reader/lock technology chosen above.

The two primary "open" platforms for access control controller hardware are Mercury and HID VertX. Mercury appears, in the opinion of **TRUSYS**, to have a larger percentage of ACS system manufacturers who have chosen this hardware solution, and both primary manufacturers of integrated reader/locks have integrations with the Mercury hardware solution.

Issues that need to be addressed prior to the new system's installation are:

1. What is the ability of the new system to use the existing wiring infrastructure?

Note: The existing system uses a non-shielded, twisted pair for the RS-485 communications to the CRCs. RS-485 is a robust serial communications protocol that is often specified with a shielded, twisted pair cable. Per Mercury, the shield "drain" which is connected to the RS-485 terminal block is more for the purpose of creating a common ground reference than for electronic noise reduction. The common reference can be achieved by bonding all of the negative sides of the modules' power circuits (not lock power circuits) together and referencing them to ground.

The Mercury stated that they have run in house tests using unshielded CAT-5 cable, and using one of the conductors to create a ground reference at the power supply.

This approach assumes that the wiring is installed per the National Electrical Code (NEC) and that the cabling has not been simply laid along the top of ceiling areas where it can come into direct contact with fluorescent light ballast or other noise inducing components.

A two stage testing process to confirm this approach is recommended:
Stage 1: A lab test using the same cable that is currently installed
Stage 2: A single building installation that confirms operation prior to moving forward with a system wide replacement

2. Can the existing multi-mode fiber optic network be used for the TCP/IP communications for the new ACS?
   Note: This fiber network is extremely robust, and by using this network where the existing panels are located, it will help to minimize the installation cost of the new system by not requiring wiring runs between an MDF and/or IDF in the building.

   The decision can be made later whether or not to maintain the above practice or shift to an MDF/IDF model for buildings that have not yet had ACS installed.

3. Can the existing power supplies be used?
   Note: Should the power supplies provide any functions that are for the purpose of life safety, then new power supplies should be required for installation. If they are dedicated for the purposes of security, then it is highly likely that they could be reused.

ACS SOFTWARE

Once the card technology and associated readers and integrated reader/lock technology have been selected and the open control hardware platform selected, then ACS software manufacturers should be selected via an RFP for interview that can support the selected technologies.

Features that **TRUSYS** recommends focusing on during the RFP process are:

How does the ACS integrate with Banner and Data Card?

- How does the ACS software integrate with other 3rd Party Applications such as Event and Conference Management?

What Partners has the ACS manufacturer chosen for System Integration?

- How many VMS Partners have they Certified with their solution?
- How many IDS Partners have they Certified with their solution?
- Have they developed an alternative IDS solution such as using Mercury's keypad for IDS interface?

What is the software's ability to support "concurrent thin clients" and administrative functions needed at WWU?

What is the cost of ongoing licensing and software support agreements?

- Per individual or blocks of door reader licenses?
- Integration with 3rd Party data bases?
- Integration with Partner solutions such as IDS and VMS?
- Camera licensing, i.e. do they double charge?

Figure 3: ACS Software Issues

SUMMARY

WWU should select an ACS solution that meets their needs and expectations.

TRUSYS recommends that WWU develop a Security Plan before moving forward on any ACS Solution. Simply using a consultant to tell WWU how and what should be used for their ACS solution will lead to a short term, successful implementation, but will likely be a long term failure if a comprehensive Security Plan is not created and implemented.

INTEGRATED SYSTEMS VS. STAND-ALONE

TRUSYS recommends that an integrated systems approach be taken at WWU. The following path assumes that funds will be made available.

The following is Milestone 6 from Figure 2 above with more detail provided.

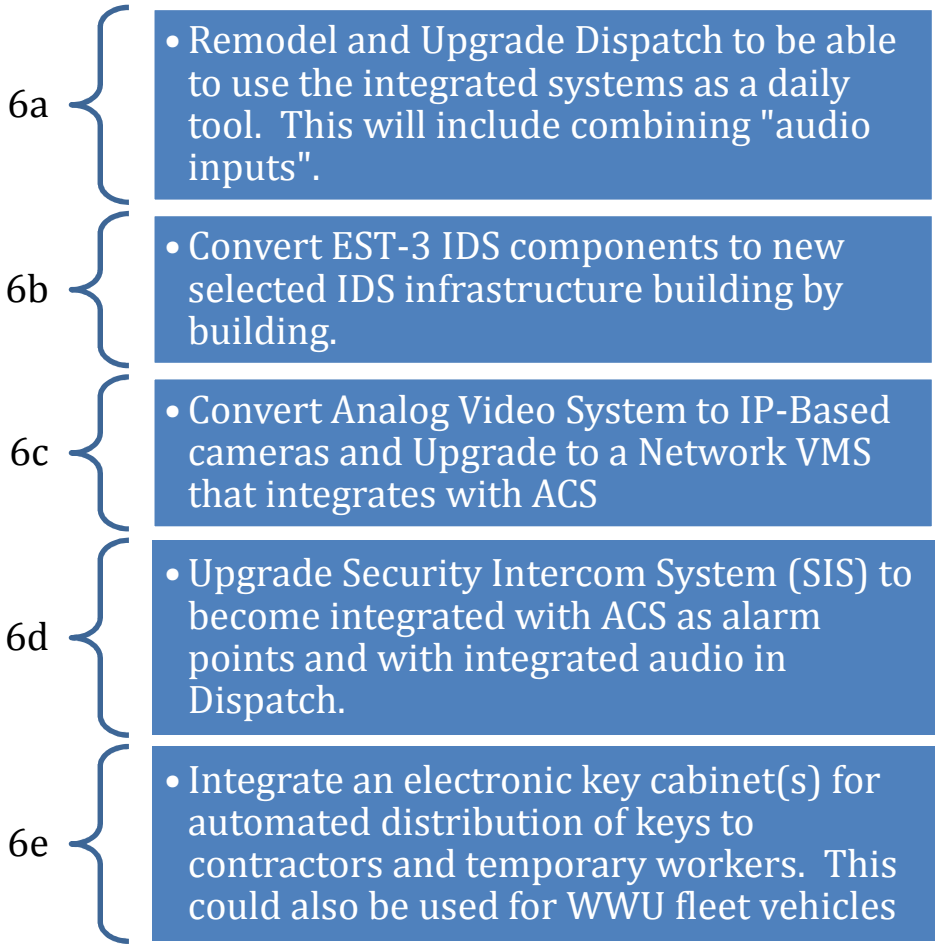


Figure 3: Recommended Milestones

APPENDIX C - SECURITY PLAN COMMENTS

A primary question that must be answered to create a Security Plan is what is the purpose or mission of security? Said in a different way, what is the role of security in supporting the mission of Western Washington University?

If Security Technology such as access control, video, audio communications, and intrusion detection cannot deter security events or be used as a tool to manage such an event it is likely to atrophy after its initial deployment.

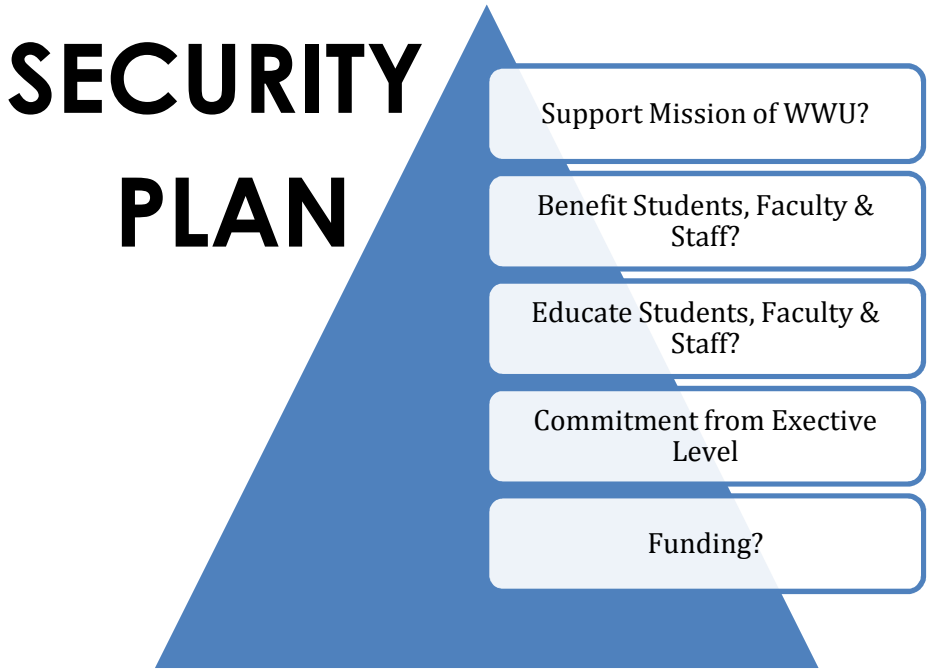


Figure 1: Critical Questions for Security Plan

The following are offered as key points for consideration in developing a Security Plan for WWU.

1. How will a Security Plan support the mission of WWU?
2. How will a Security Plan benefit students, faculty and staff at WWU?
3. How will students, faculty and staff be educated about the Security Plan at WWU; and how will that education process be appropriate for their status or position at WWU?
4. What is the commitment from the Executive level of WWU to a long term Security Plan?
5. What is the ability of WWU to fund a Security Plan?

BUILDING BLOCKS

The ability to build a resilient Security Plan will rest upon the ability of WWU to create key Building Blocks. **TRUSYS** has found that when the following building blocks are developed at functional, tactical and strategic levels that a resilient Security Plan can occur.

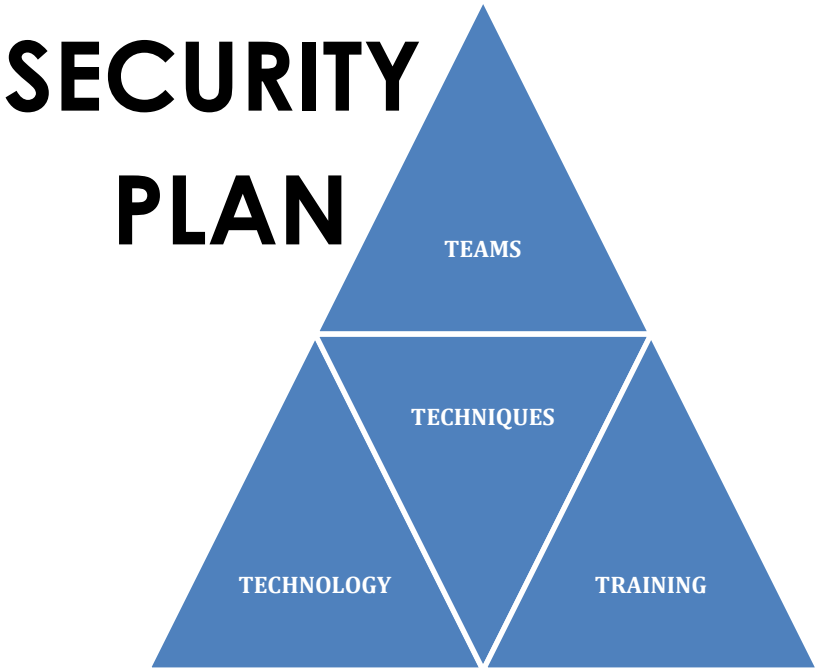


Figure 2: Building Blocks for Security Plan

1. Teams: People
2. Techniques: How to use Teams, Technology, and Training
3. Technology: Tools to assist and leverage the Security Plan
4. Training: The practical integration of Teams, Techniques, and Technology

TEAMS

Teams, Functional, Tactical, and Strategic, would be discerned during the planning and preparation of the Security Plan. The ability for the Security Plan to remain resilient and sustainable is based upon the collective strength of the employees, staff and stakeholders who comprise the various Teams.

There are several Functional Teams that are suggested to be formed and given operating parameters at WWU. They are:

1. Operations: This Team would be responsible for the daily operation and programming of the security technologies, including ACS. Note: As previously mentioned, it is highly desired to have a single management position that has accountability and responsibility for the daily operation of the Security Technology component, while still working within the Team environment. This should be considered as an "Exempt" position versus a "Classified" position at WWU.
2. Maintenance: This Team would likely be comprised of various trades from Facilities, IT, and the Lock Shop, and would have representation from the Operations Team.
3. Response: This would be primarily comprised of the Police Dispatch and Uniformed Officers.
4. Administrative: This would be comprised of all users with access to the client software, and who can assign privileges to card holders within their group and to

areas within their building(s). At the highest level this would include all areas including Residence Management, and could be comprised of smaller Teams that are based upon specific use areas/buildings on the campus or satellite areas.

Tactical Teams typically would be in response to a range of security events, with each Team appropriate to the level of the event.

There are two (2) apparent Strategic Teams that should be developed at WWU, with others that may be developed during the planning and preparation of the Security Plan.

1. Strategic Security Vision: This Team, similar to the Access Control Committee to whom this report is being submitted, would be responsible for the long range Security Plan. It would monitor the progress of the Security Plan to reach milestones and to audit its capabilities and effectiveness.

   Another primary task would be to secure funding for maintaining and operating the aspects of the Security Plan that are already in place, and to secure funding for upcoming milestones that are planned as enhancements or modifications to the Security Plan.

   All key stakeholders should be represented on this Team including a representative from the University President's or Provost's offices.

2. Strategic Response: This Team would function during security events where such things as press releases, press interviews, and notification to families are required.

TECHNIQUES

Teams must have Techniques based upon the task at hand, as well as on the structure of the organization, legislation, and stakeholder involvement. There can, of course, be different Techniques employed for different security events; however, at a minimum there are Assessment, Operational, and Compliance Techniques.

TECHNOLOGIES

In order to support the Teams and their Techniques, Technologies must be introduced based on strategies, how those strategies are employed, and the tasks that need to be accomplished. Technology must not drive the process; it must support the Teams and the Techniques that are employed to accomplish their mission.

TRAINING

Training is critical for implementing a successful Security Plan. Training must be continuous for all Teams, in all areas in which they are working. Without Training, the Teams will not be current in the Techniques or the Technologies they are using, or as new Techniques and Technologies emerge.

ISSUES FOR CONSIDERATION IN A SECURITY PLAN

The following are offered for consideration with this Roadmap approach.

1. Is there a commitment by WWU to develop a long term, comprehensive Security Plan?
2. Does WWU have the ability to provide the financial support for the following?
   a. Planning Phase
   b. Deployment of Initial Security Plan Technologies
   c. Cost of licensing and software support agreements needed for Security Technologies, and maintenance of said technology
   d. Funding for development and final planning of the identified milestones or those that will be identified as the Security Plan matures
3. Will satellite facilities such as Shannon Point Marine Center be included in the Security Plan? If yes, how many satellite locations are there, and what is the extent of their security needs?
4. Security Technology Considerations:
   a. What is the role of each specific Security Technology at WWU?
   b. What level of Security Technology integration is desired for WWU?
   c. What is the role of ACS for integrating other Security Technologies such as intrusion detection, video and audio emergency communications?
   d. What card and reader technology will be used at WWU?
      i. What are the policies and issues that need to be resolved for using this technology including the placement of pictures and personal information on the card?
      ii. What are the driving factors to move from Proximity technology to Smart Card technology such as WTA and other vendor type systems such as cafeteria, printing, and library?
   e. What are the specific needs for the transfer of data base information between systems such as Banner, Data Card, etc…?
   f. How will the integration of systems affect the ability of Campus Police Dispatch to efficiently work with the systems?
   g. Should advance training and remodel of Dispatch be considered as milestones for the Security Plan?

APPENDIX D - RESULTS OF REQUIRED VS. DESIRED ASSESSMENT

On January 28, 2013, TRUSYS facilitated an Access Control Stakeholder Meeting at WWU. It was attended by the members of the Access Control Replacement Committee and key stakeholders from WWU.

This meeting established that WWU does not have a clear and cohesive approach to which options and features/benefits should be incorporated either into the existing ACS or a new ACS.

The following are the results of a "Needs versus Wants" discussion regarding these new features for the WWU ACS:

Issue	Need	Want
Work with Existing Prox Readers		X
Work with WTA Now/Future	X	X
Logical Access Control	X	X
ISO 14443 Compliant Apps	X	X
Mag Stripe	X	
Bar Code	X	
NFC		X

Table 1: New Access Card

Several items, such as the new access card working with Whatcom Transit Authority (WTA), Logical Access Control and Compliance with ISO 14443 Apps are classified by the Stakeholders as being both Needs and Wants.

Issue	Need	Want
Desire to Continue with Existing Lock Hardware Manufacture?	X	X
Ability to Remotely Lockdown Exterior Doors?	X	
Ability to Remotely Lockdown Interior Doors?		X
Use of PoE Reader/Lock?	Cost	
Use of Wireless Reader/Lock?	Cost	
Use of Wi-Fi Reader/Lock?	Cost	

Table 2: New Reader/Lock Technology

Stakeholders were split on staying with the current Ingersoll Rand companies (Schlage and Von Duprin), with some advocating to maintain the relationship, and others expressing it as a Want.

Issue	Need	Want
Desire to Continue with Existing "Edge" (Distributed) Configuration?		X

Use of Low-Proprietary Hardware?	Cost
Use of High-Proprietary Hardware?	Cost
Use of Centralized, Wiegand?	Cost
Use of Distributed, Wiegand?	Cost
Use of Edge (Ethernet/PoE)?	Cost

Table 3: New ACS Hardware Configuration

When the subject of integrated reader/lock technology was broached, they were assessed to be a "Need" but cost is a principal driving issue.

The consensus of the group was that there is a desire to maintain the "distributed" configuration that exists with the system today. Again, the primary driving factor voiced by the group was, "What will the cost be?"

It is apparent from the responses, that a significant amount of the Stakeholders do not yet have a feel for how cost can be controlled with the use of some of the newer technology options that are available.

Issue	Answer
Desired Operating Software?	Linux
Desired Database?	Oracle
Desired Hardware (COTS, Appliance, VM)?	VMware
Client Stations?	1/Building Concurrent Licensing

Table 4: New ACS Software Configuration

The group was able to clearly articulate its preference for operating systems and data base engines.

Issue	Need	Want
3rd Party Integration w/IDS?	X	
3rd Party Integration w/VMS?	X	
3rd Party Integration w/SIS?	X	X
Incident Command System Integration?		X
Active Directory Integration?		X
Direct Banner Integration?		X
Banner Integration via Active Directory?		X
Direct Integration w/CollegeNet?		?
Direct Integration w/Event Management?		X
Direct Integration w/Conference Management?		X
Mobile Monitoring (handheld and/or laptop)?		X

Table 5: New ACS System & Data Integration

There is a "Need" to have an integrated system approach, and that the integration of data bases (Banner) and other scheduling systems (CollegeNet, Event Management, & Conference Management) with the ACS are highly desired.

SUMMARY

The repeated theme heard in the Stakeholders' Meeting and in individual interviews was that of cost, i.e. budget. Many Stakeholders are unclear on what the true cost of ownership will be for a new ACS, but general consensus is that an integrated system and data base approach is necessary and desired.

Figure 1: Uncertainty of Cost/Budget

BUDGETARY ESTIMATE FIGURE 1: TIMELINE (ENLARGED VIEW)