

Perry	144,375	\$105,052,000
Philadelphia	262	\$487,000
Schuylkill	118,501	\$124,752,000
Snyder	100,179	\$109,041,000
Sullivan	27,821	\$7,240,000
Union	63,795	\$90,497,000
Washington	211,053	\$28,649,000
Wyoming	77,957	\$13,496,000
York	292,507	\$212,634,000
TOTAL	3,733,791	\$4,084,279,000

4.3.22.9. State Facility Loss Estimation

The estimated replacement cost of all State Critical Facilities located within the 10-mile plume exposure pathway EPZ is \$1,819,008,224. Because most of the food and agriculture-related critical facilities are privately held, the replacement value of these facilities is unknown.

4.3.23. Terrorism

4.3.23.1. Location and Extent

Terrorism is a threat everywhere, but there are a number of important considerations in evaluating terrorism hazards, such as the existence of facilities, landmarks, or other buildings of international, national, or regional importance. High-risk targets for acts of terrorism include military and civilian government facilities, international airports, large cities, and high-profile landmarks. Terrorists might also target large public gatherings, water and food supplies, utilities, and corporate centers. Furthermore, terrorists are capable of spreading fear by sending explosives or chemical and biological agents through the mail (FEMA, April 2009).

Nonetheless, terrorism can take many forms and terrorists have a wide range of personal, political, or cultural agendas. Therefore, there is no location that is not a potential terrorist target.

Of particular concern to Pennsylvania are the many critical facilities in the Commonwealth. Police stations, hospitals, military installations, fire stations, schools, wastewater treatment plants, and nuclear power generation stations along with critical infrastructure such as bridges, tunnels, electric generation and distribution facilities, public water supplies, and government buildings may be potential terrorist targets. Damage to these facilities and infrastructure could cripple transportation routes and commerce. Additionally, there are over 3,300 SARA Title III facilities as well as many transportation routes vital to the entire nation traversing the Commonwealth, making intentional hazard material releases a potential threat to citizens and the environment. This hazard is addressed in full in Section 4.3.19.

4.3.23.2. Range of Magnitude

The term “terrorism” refers to intentional, criminal, malicious acts, but the functional definition of terrorism can be interpreted in many ways. Officially, terrorism is defined in the CFR as “...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social

objectives” (28 CFR §0.85). Terrorists use threats to create fear, to try to convince citizens of the powerlessness of their government, and/or to get publicity for their cause.

Terrorist attacks can take many forms, including agriterrorism, arson/incendiary attack, armed attack, assassination, biological agent, chemical agent, cyberterrorism, conventional bomb, hijackings, intentional hazardous material release, kidnapping, nuclear bomb and radiological agent (FEMA April 2009). Explosives have been the traditional method of conducting terrorism, but intelligence suggests that the possibility of biological or chemical terrorism is increasing. The severity of terrorist incidents depends upon the method of attack, the proximity of the attack to people, animals, or other assets and the duration of exposure to the incident or attack device. For example, chemical agents are poisonous gases, liquids or solids that have toxic effects on people, animals, or plants. Many chemical agents can cause serious injuries or death. In this case, severity of injuries depends on the type and amount of the chemical agent used and the duration of exposure.

Biological agents are organisms or toxins that have illness-producing effects on people, livestock and crops. Some biological agents cannot be easily detected and may take time to develop. Therefore, it can be difficult to know that a biological attack has occurred until victims display symptoms. In other cases, the effects are immediate. Those affected by a biological agent require the immediate attention of professional medical personnel. Some agents are contagious which may result in the need for victims to be quarantined.

In recent years, cyber terrorism has become a larger threat than in years past. Cyber terrorism can be defined as activities intended to damage or disrupt vital computer systems. These acts can range from taking control of a host website to using networked resources to directly cause destruction and harm. Protection of databases and infrastructure appear to be the main goals at this point in time. Cyber terrorists can be difficult to identify because the internet provides a meeting place for individuals from various parts of the world. Individuals or groups planning a cyber-attack are not organized in a traditional manner, as they are able to effectively communicate over long distances without delay. One of the more prominent groups involved in large-scale hacking events recently is the group “Anonymous.” They have been known to overtake websites, and alter the content that is presented to the public. The largest threat to institutions from cyber terrorism comes from any processes that are networked and controlled via computer. Any vulnerability that could allow access to sensitive data or processes should be addressed and any possible measures taken to harden those resources to attack.

Active shooters, as defined by the US Department of Homeland Security, is an individual actively engaged in killing or attempting to kill people in a confined area; in most cases, active shooters use firearm[s] and there is no pattern or method to their selection of victims. Recent high-profile incidents involving active shooters include; the Sandy Hook Elementary school shootings in Newtown, Connecticut, the shooting in the Aurora, Colorado movie theater and the shooting in Tucson, Arizona involving U.S. Representative Gabrielle Giffords. Historical active shooter events include the Virginia Tech shootings, the Columbine High School shootings and the University of Texas, Austin shootings. No substantive research has yet been compiled to address the potential vulnerability to an active shooter incident. As a very open, public society,

these incidents are easier to accomplish for those bent on doing harm. Some of these incidents have occurred in public places, and some in places that are considered more restricted (like elementary schools and high schools). There is no discernible pattern to the location chosen by the shooter.

Instances of terrorism in the Commonwealth have thus far been limited; in the September 11, 2001 attacks, while United Flight 93 crashed in Pennsylvania, its target lay elsewhere. In this incident, four individuals hijacked the plane with the intent of crashing it into a target in Washington, DC. They failed to reach their destination, and all 40 passengers and crew members on board perished.

The worst-case scenario for a terrorism event in Pennsylvania would be if a “dirty bomb” combining radioactive material with conventional explosives were to be detonated in Center City Philadelphia at lunchtime on a weekday. At that time of day and location, a significant number of individuals would be exposed to the bomb’s radiation both at the time of detonation and after the fact as the radiation spread. The explosive device could damage or even topple buildings, spark utility outages citywide, and/or ignite large-scale urban fires. This worst-case scenario is based on a planning scenario used in developing the Pittsburgh Central Business District Evacuation Plan; the location was switched to Philadelphia as the state’s largest population center.

4.3.23.3. Past Occurrence

There has been a high consciousness of terrorist activity in the press with few catastrophic events. The most significant terrorist attack on US soil occurred on September 11, 2001; Flight 93, the fourth hijacked aircraft in the attack, crashed in Somerset County, Pennsylvania. Another significant recent terrorist event was the detonation of a pair of homemade pressure cooker bombs at the finish line of the Boston Marathon. This event killed three people and injured a further 264 people. While this event did not happen in Pennsylvania, numerous cities throughout the Commonwealth host similar large scale outdoor activities that could be potential targets; the PEMA was on a state of heightened alert for the Philadelphia Marathon, which occurred shortly after the bombing in Boston.

Pennsylvania experiences threats and suspected terrorist activity frequently as reported to PEIRS. This is evidenced in Table 4.3.23-1.

THREAT/SUSPECTED TERRORIST ACTIVITY TYPE	2001	2002	2003	2004	2005	2006	2007	2008	2009*
Biological Threat	2	0	0	0	0	0	1	0	0
Bomb Found	6	15	7	17	17	14	16	10	4
Bomb Threat	336	240	194	167	167	166	185	132	49
Cyber Attacks	1	4	1	2	0	1	0	1	0
Hostage Situation	16	5	7	5	7	6	6	8	2
Sabotage	2	1	0	1	1	3	0	0	0
School Bomb Threat	0	0	0	72	111	121	204	170	73
Suspected Terrorism	2	0	0	5	1	1	1	1	0

Table 4.3.23-1 Threat and suspected terrorist activity events reported to PEIRS, 2001-2009 (PEIRS)

THREAT/SUSPECTED TERRORIST ACTIVITY TYPE	2001	2002	2003	2004	2005	2006	2007	2008	2009*
Terroristic Threat	117	9	12	16	9	18	37	19	9
Terrorist Activity - totals	482	274	221	285	313	330	450	341	137

**Events totaled through June 2009*

In addition, suspicious activity plays into terrorism hazards because of the uncertainty associated with those events. Table 4.3.23-2 displays suspicious activity events as reported to PEIRS from January 2001-June 2009.

Table 4.3.23-2 Threat and suspected suspicious activity events reported to PEIRS, 2001-2009 (PEIRS)

THREAT/SUSPECTED SUSPICIOUS ACTIVITY TYPE	2001	2002	2003	2004	2005	2006	2007	2008	2009*
Suspicious Activity	74	41	42	59	52	77	110	62	20
Suspicious Device	21	16	42	56	86	86	95	34	43
Suspicious Package	374	67	60	82	96	77	77	61	24
Suspicious Substance	637	15	15	41	30	42	33	21	5
Terrorist Activity - totals	1106	139	159	238	264	282	315	178	92

**Events totaled through June 2009*

WebEOC, the emergency incident reporting system in place from 2010-2012, does not include a separate category for terrorist activities, threats, or suspicious activities. As a result, while it is likely that they have continued to occur since 2009, there is no comprehensive county of these activities.

4.3.23.4. Future Occurrence

Based on historical events, Pennsylvania can expect to experience several terrorist incidents and suspicious activities each year. Note that this estimate is based on the occurrence of past events over a short period of time and is not the result of detailed statistical sampling. Although previous events have not resulted in what are considered significant terrorist attacks, the severity of a future incident cannot be predicted with a sufficient level of certainty. Prediction of terrorist attacks is almost impossible because terrorism is a result of human factors. As long as fringe groups maintain radically different ideas than that of the government or general population, terrorism is a possibility.

4.3.23.5. Environmental Impacts

The impacts of terrorism can vary in severity from nominal to catastrophic and are contingent upon the method of the attack, the volume of force applied, and the population density of the attack site. There may be significant loss of life for humans and animals as well as economic losses. Additionally, the impact of the attack itself may be exacerbated by the fact that human services agencies like community support programs, health and medical services, public assistance programs, and social services can experience physical damage to facilities, supplies,

and equipment and disruption of emergency communications. There may also be ancillary effects of terrorism such as urban fires or, in the case of a radiological device, radioactive fallout that can multiply the impact of a terrorist event.

4.3.23.6. Jurisdictional Vulnerability Assessment

All communities in the Commonwealth are vulnerable on some level, directly or indirectly, to a terrorist attack. However, communities where the previously mentioned potential targets are located should be considered more vulnerable. Larger cities like Philadelphia and Pittsburgh are the most vulnerable to terrorist attacks due to the sheer size of these urban areas, density of the population, and concentration of critical infrastructure located there. Port facilities in Pittsburgh, Philadelphia, and Erie are also possible targets because of their role as logistics hubs. Because of its status as the state capital, Harrisburg also has elevated vulnerability.

Table 4.3.lists which of the 32 counties that did and the 35 counties that did not profile terrorism, along with any ranking provided. As stated in Section 4.1, the decision by a county to profile a hazard is one indicator of the presence of risk from that hazard. This indicator should be viewed complementary to other analysis in this section. Together this analysis from reputable sources addresses different aspects of risk for a full risk profile.

Of the 24 counties which currently have calculated risk factor values for terrorism, the average value is 2.0; this average does not include Lebanon, Montour, Perry, and Philadelphia, who use an alternate Risk Factor/Ranking system. The State Risk Factor for Terrorism is 2.0, while the Pennsylvania THIRA scored terrorism as a 6 out of 10. For more details on the State Risk Factor and THIRA rankings, please see Section 4.1.

Table 4.3.23-3 Counties profiling terrorism with hazard ranking and risk factor (if available).				
COUNTY	PROFILED HAZARD	DID NOT PROFILE HAZARD	RANKING (IF AVAILABLE)	RISK FACTOR (IF AVAILABLE)
Adams	X		High	3.2
Allegheny		X		
Armstrong		X		
Beaver	X		Medium	2.0
Bedford	X		Low	1.4
Berks		X		
Blair		X		
Bradford	X		Not Ranked	No RF
Bucks		X		
Butler		X		
Cambria	X		Medium	2.3
Cameron	X		Low	1.2
Carbon		X		

Table 4.3.23-3 Counties profiling terrorism with hazard ranking and risk factor (if available).				
COUNTY	PROFILED HAZARD	DID NOT PROFILE HAZARD	RANKING (IF AVAILABLE)	RISK FACTOR (IF AVAILABLE)
Centre	X		Medium	2.2
Chester		X		
Clarion		X		
Clearfield	X		Low	1.1
Clinton		X		
Columbia		X		
Crawford		X		
Cumberland	X		Medium	2.1
Dauphin		X		
Delaware		X		
Elk	X		Low	1.8
Erie		X		
Fayette	X		Low	1.7
Forest		X		
Franklin		X		
Fulton		X		
Greene		X		
Huntingdon	X		Not Ranked	No RF
Indiana	X		Low	1.9
Jefferson	X		Low	1.3
Juniata	X		Low	1.9
Lackawanna		X		
Lancaster		X		
Lawrence	X		High	2.5
Lebanon*	X		Not Ranked	2.9
Lehigh	X		Low	1.9
Luzerne		X		
Lycoming	X		High	2.7
McKean	X		Low	1.6
Mercer	X		Low	1.6
Mifflin	X		Not Ranked	No RF
Monroe		X		
Montgomery	X		Medium	2.4

Table 4.3.23-3 Counties profiling terrorism with hazard ranking and risk factor (if available).				
COUNTY	PROFILED HAZARD	DID NOT PROFILE HAZARD	RANKING (IF AVAILABLE)	RISK FACTOR (IF AVAILABLE)
Montour*		X		
Northampton	X		Low	1.9
Northumberland		X		
Perry*	X		Not Ranked	2.9
Philadelphia**		X		
Pike	X		High	2.5
Potter		X		
Schuylkill		X		
Snyder		X		
Somerset	X		Not Ranked	No RF
Sullivan		X		
Susquehanna		X		
Tioga		X		
Union	X		Not Ranked	No RF
Venango		X		
Warren	X		Medium	2.2
Washington		X		
Wayne	X			
Westmoreland	X			
Wyoming		X		
York	X		Medium	2.3

* Lebanon, Montour, and Perry use an alternate weighted ranking where Risk Factor = Frequency x [(0.25 x Critical facilities) + (0.40 x Social) + (0.25 x Economic) + (0.10 x Environmental)]. While this risk factor was used to comparatively rank hazards, the number does not correspond to a high-medium-low rating.

**Philadelphia uses an A, B, C rating system where A is high, B is medium, and C is low.

4.3.23.7. State Facility Vulnerability Assessment

Since the probability of terrorism occurring cannot be quantified in the same way as that of many natural hazards, it is not possible to assess vulnerability in terms of likelihood of occurrence. Instead, vulnerability is assessed in terms of specific assets. By identifying potentially at-risk terrorist targets in Pennsylvania, planning efforts can be put in place to reduce the risk of attack. FEMA’s *Integrating Manmade Hazards into Mitigation Planning* (2003) encourages site-specific assessments that should be based on the relative importance of a particular site to the surrounding community or population, threats that are known to exist and vulnerabilities including:

- **Inherent vulnerability:**
 - Visibility – How aware is the public of the existence of the facility?
 - Utility – How valuable might the place be in meeting the objectives of a potential terrorist?
 - Accessibility – How accessible is the place to the public?
 - Asset mobility – is the asset's location fixed or mobile?
 - Presence of hazardous materials – Are flammable, explosive, biological, chemical and/or radiological materials present on site? If so, are they well secured?
 - Potential for collateral damage – What are the potential consequences for the surrounding area if the asset is attacked or damaged?
 - Occupancy – What is the potential for mass casualties based on the maximum number of individuals on site at a given time?
- **Tactical vulnerability:**
 - Site Perimeter*
 - Site planning and Landscape Design – Is the facility designed with security in mind – both site-specific and with regard to adjacent land uses?
 - Parking Security – Are vehicle access and parking managed in a way that separates vehicles and structures?
 - Building Envelope*
 - Structural Engineering – Is the building's envelope designed to be blast-resistant? Does it provide collective protection against chemical, biological and radiological contaminants?
 - Facility Interior*
 - Architectural and Interior Space Planning – Does security screening cover all public and private areas?
 - Mechanical Engineering – Are utilities and Heating, Ventilating and Air Conditioning (HVAC) systems protected and/or backed up with redundant systems?
 - Electrical Engineering – Are emergency power and telecommunications available? Are alarm systems operational? Is lightning sufficient?
 - Fire Protection Engineering – Are the building's water supply and fire suppression systems adequate, code-compliant and protected? Are on-site personnel trained appropriately? Are local first responders aware of the nature of the operations at the facility?
 - Electronic and Organized Security – Are systems and personnel in place to monitor and protect the facility?

When considering cyber terrorism or cyber-attack, According to Carnegie Mellon University's CyLab, locations with publicly accessible or shared computer workstations are more vulnerable to malicious internet outages, as open access allows for easier access to shared data and system information.

4.3.23.8. *Jurisdictional Loss Estimation*

Jurisdictional loss estimates can vary greatly in a terrorism event based on the magnitude and type of terrorist action. Catastrophic terrorism events will have proportionally catastrophic losses

for the jurisdiction in question. For example, losses may be greater in an event that results in the complete destruction of a high-rise building; in that scenario, losses will stem from loss of life, the actual destruction of the building, and business interruptions. For comparison's sake, the total losses incurred by New York City in the September 11, 2001 attacks are estimated at \$83-95 billion. This loss estimate includes lost tax revenue for the city, the cost of response and recovery, business interruptions, deaths, building damage, and infrastructure damage. The cost of evacuation could be significant; the City of Pittsburgh estimates that should a large-scale terrorist event occur in the central business district, they would have to evacuate approximately 65,000 workers and approximately 7,000 university students. Likewise, many visitors to the central business district, while intending to remain for the day or staying overnight, are anticipated to require evacuation assistance. While Pennsylvania's cities are certainly smaller than New York, losses could still be severe.

4.3.23.9. State Facility Loss Estimation

All state facilities are vulnerable to terrorism in some way, whether or not the facility itself is the target of an attack. While highly unlikely that all critical facilities would be destroyed in a single event, the total replacement cost of all state critical facilities with known replacement values is \$47,154,997,513.00.

4.3.24. Transportation Accident

4.3.24.1. Location and Extent

Transportation accidents are defined as accidents involving highway, air, and rail travel. These incidents are collectively the most costly of all hazards in the Commonwealth in terms of lives lost, injuries, and economic losses. Pennsylvania has the fifth largest state highway system in the United States – larger than New York, New Jersey, and New England combined (Federal Highway Administration, 2011). Pennsylvania's highway transportation network consists of 119,686 linear miles of roadway, of which Pennsylvania Department of Transportation (PennDOT) is responsible for 41,166 miles, and 31,400 bridges, of which 25,000 are owned by PennDOT. Daily vehicle miles traveled (DVMT) on the Pennsylvania highway system is 277,293,041; 66% of this total occurs in urban areas while 33% occurs in rural areas (PennDOT, 2012). The sheer amount of roadway coupled with the high volume of traffic creates the potential for serious accidents along the Commonwealth's roads and bridges.

Pennsylvania's highway transportation network encompasses a number of key routes for the movement of goods and people, including Interstates 76 (PA Turnpike), 78, 80, 81, 95, and 476 (PA Turnpike Northeast Extension) and US Routes 15, 22, 30, and 202. Figure 4.3.24-1 illustrates the average annual daily traffic for Pennsylvania roads; this map highlights the volume of traffic on these and other key routes.