

## CHARACTERISTICS AND COMMON VULNERABILITIES INFRASTRUCTURE CATEGORY: SHOPPING MALLS

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*Preventing terrorism and reducing the nation's vulnerability to terrorist acts require understanding the common vulnerabilities of critical infrastructures, identifying site-specific vulnerabilities, understanding the types of terrorist activities that likely would be successful in exploiting those vulnerabilities, and taking preemptive and protective actions to mitigate vulnerabilities so that terrorists are no longer able to exploit them. This report characterizes and discusses the common vulnerabilities of malls and shopping centers that contain a group of retail and other commercial establishments typically enclosed with a climate-controlled walkway between facing strips of stores.*

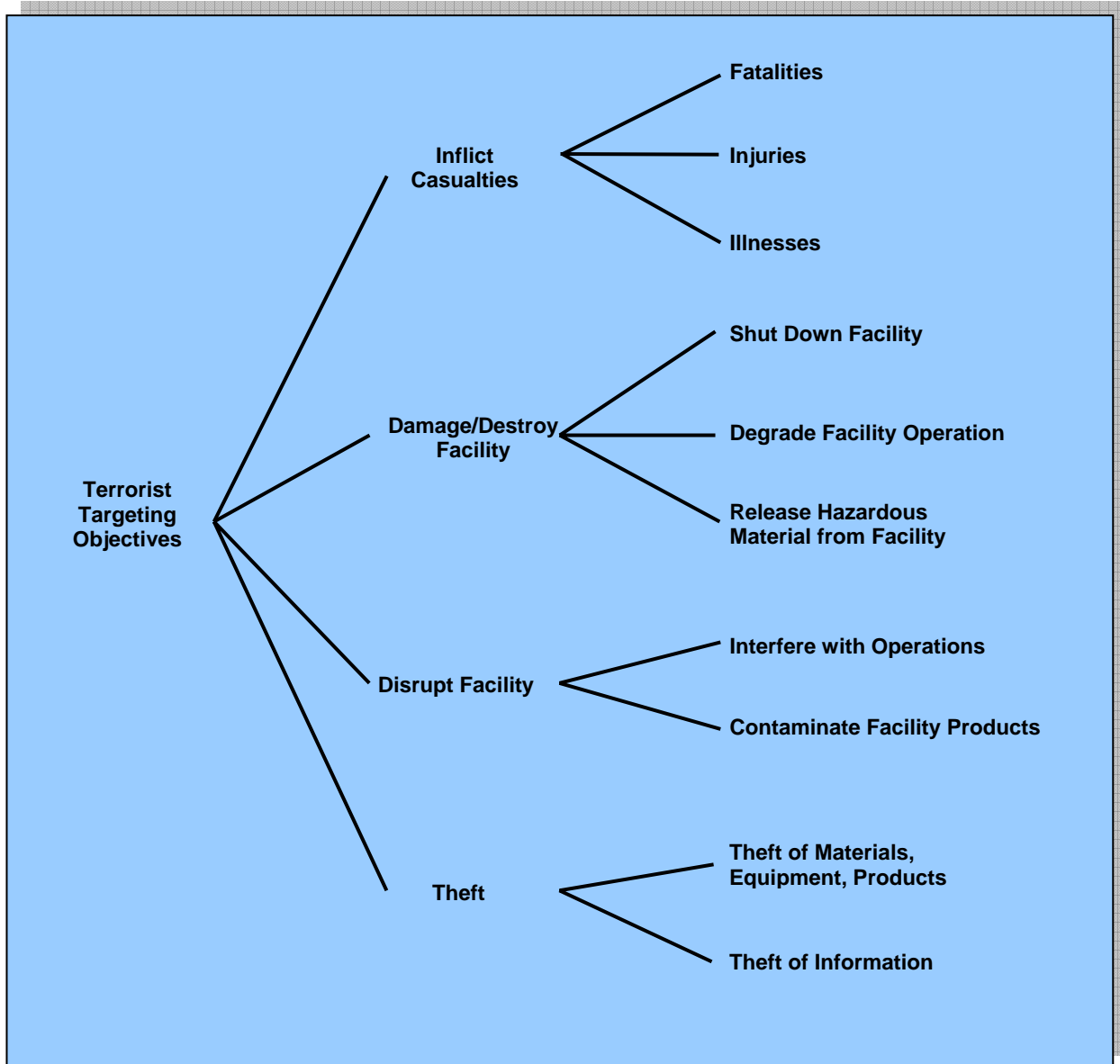
### POTENTIAL THREATS

Shopping malls are potential targets for terrorist attacks because of the ability to inflict casualties, cause economic damage, and instill fear. Furthermore, they are “soft targets” in that they serve the general public, and the presence of a significant number of American citizens is assured at certain times of the day. Due to the nature of their functions, these facilities usually lack perimeter or access controls. Due to their accessibility, soft targets are more vulnerable, and virtually impossible to defend against terrorist attacks. Damage or destruction of a large mall could inflict mass casualties, primarily on site; shut down or degrade its operation, thus having a significant impact on the economic well-being of a large area; have widespread psychological impact; and cause the release of hazardous materials. Disruption of the facility without inflicting actual damage can result in severe financial losses and erode the confidence of customers in returning to the site. In addition, any significant terrorist attack at a large shopping complex, especially with numerous casualties, would have a cascading effect. Concern over safety and fear that an attack could occur elsewhere would cause shoppers to avoid malls nationwide, dealing a significant blow to the retail sector of the United States' (U.S.) economy. Figure 1 shows potential objectives of terrorist attacks.

Specific terrorist threats of concern to large shopping mall include:

- Explosives (e.g., car bomb, suicide bomber),
- Arson (e.g., firebombing, using accelerants),

- Biological agents introduced into the facility (e.g., anthrax, botulism),
- Chemical agents introduced into the facility (e.g., chemical warfare agents, toxic industrial chemicals),
- Hostage/barricade, and
- Automatic weapons attack (e.g., indiscriminate shooting of patrons, like a Columbine-type incident).



**Figure 1 Potential Terrorist Targeting Objectives**

## **FACILITY CHARACTERISTICS**

The following sections provide a summary description of large shopping malls and their configurations and vulnerabilities that could be exploited by terrorists and other adversaries.

### **Characterization of the Industry**

In its last published shopping center census, the National Research Bureau (NRB) reported that in 2002 the U.S. had a total of 46,438 shopping centers nationwide. These shopping areas range from small open-air neighborhood “strip” shopping centers with less than 10,000 square feet (ft<sup>2</sup>) of gross leaseable area (GLA) to super-regional malls with GLAs greater than 1 million ft<sup>2</sup>. The *Directory of Major Malls* includes centers with a GLA of 250,000 ft<sup>2</sup> and above, which are called the “the primary centers in the industry.” The NRB census, however, uses a different criterion in establishing shopping center categories. Thus, as of 2002 the NRB reported that there were 4,137 shopping centers with a GLA of 200,001–400,000 ft<sup>2</sup>; 1,507 with a GLA of 400,001–800,000 ft<sup>2</sup>; 332 with a GLA of 800,001–1,000,000 ft<sup>2</sup>; and 424 with a GLA greater than 1,000,000 ft<sup>2</sup>. Not all of these centers are enclosed malls, and there is no breakdown as to how many in each category are enclosed.

Based on criteria established by The International Council of Shopping Centers (ICSCs), the shopping mall study program at Eastern Connecticut State University (ECSU) has classified five major categories of shopping centers: convenience, neighborhood, community, regional, and super-regional. The ICSC also describes four kinds of specialty centers: fashion/specialty, power, theme/festival, and outlet. This report focuses on the 756 centers with GLAs greater than 800,000 ft<sup>2</sup> that the ICSC includes in its super-regional category, while noting that there are smaller, but prominent, malls in cities such as Washington, DC, and New York.

Large malls are located in every region of the country and in most, if not all, major metropolitan areas.

### **Common Facility Characteristics and Vulnerabilities**

According to the Fujita Scale Enhancement Project at Texas Tech University, construction of a large mall typically consists of a flat roof (some areas with relatively large spans); skylights and clear stories; single-ply or BUR (built-up roof membrane) with or without roof gravel; metal stud walls with brick veneer, stucco, or EIFS (exterior insulation and finishing system, or synthetic stucco) cladding; light steel structural framing with open-web joists, light metal framing or three-dimensional space framing; and glass at entries. Large malls are usually one or two stories. All enclosed malls have heating, ventilating, and air-conditioning (HVAC) systems; electrical and telecommunication systems; and water, plumbing, and sewage systems.

According to the ICSC, the typical regional center “is usually enclosed with an inward orientation of the stores connected by a common walkway and parking surrounds the outside perimeter.” (Figure 2 shows the interior of a typical multilevel mall.) Super-regional centers are similar but “frequently with multilevels.” With few exceptions, large malls have “anchor stores,” which are “traditional, mass merchant or discount department stores or fashion specialty stores.”

While these general commonalities apply to most malls, there are numerous exceptions and configurations, making each facility unique. For example, in 2000, 38 malls had at least 1.7 million ft<sup>2</sup> of GLA according to an ECSU study; of these, 15 were one story, 13 were two stories, 5 were three stories, 4 were four stories, and 1 was not classified. The 15 one-story malls had 10 different configurations, while the 13 two-story malls had 7 different configurations. None of the three- or four-story malls was configured like the others in its category. (Figure 3 is an aerial view of a one-story mall and its surrounding parking area.)



**Figure 2 Typical Interior of Multilevel Mall**



**Figure 3 Typical One-story Mall and Its Surrounding Parking Lots**

The main vulnerabilities of shopping malls that could be exploited by terrorists and other potential adversaries are, in many ways, those characteristics required by a mall and its tenants to function effectively and prosper economically. These characteristics include open access, friendly atmosphere, large numbers of individuals coming and going, manageable labor costs, and low overhead. Measures needed to address these vulnerabilities are difficult to implement for economic and operational reasons.

To be economically viable, shopping malls must attract large numbers of customers or potential customers to patronize their tenants' businesses. To accomplish this objective, successful malls provide easy access and an inviting atmosphere. Interiors are spacious with open spaces and areas that encourage patrons to congregate and linger (e.g., food courts). Figure 4 shows the kind of open area common to multistory malls. Figure 5 shows a food court where shoppers and mall employees can eat, rest, talk, and linger. In addition, malls often host special events — everything from craft shows to health fairs to special exhibitions. Figure 6 shows a quilting show/auction, one of many special events and activities that take place in malls throughout the year. Of course, many of the people entering and exiting malls are carrying packages.



**Figure 4 Typical Mall Open Area**





**Figure 5 Typical Mall Food Court**



**Figure 6 Typical Mall Special Event**

Stores, restaurants, movie theaters, and other mall tenants, as well as the mall itself, cumulatively employ a significant workforce. Many of the jobs are relatively low paying and attract a young and transient population.

Parking varies widely among the various types of malls. Many malls, particularly one-story ones, have only outdoor parking surrounding the building. Some multistory large malls have attached or semi-attached parking garages. In some cases, parking is integrated into the mall structure. (Figure 7 shows a multilevel mall in an urban area with indoor parking.) Driving lanes in outdoor parking areas usually abut sidewalks or the mall structure. Often, parking is not allowed curbside (see Figure 3). Vehicles routinely stop in front of entrances to discharge or pick up passengers. Likewise, vehicles stop for deliveries and parcel pickup. In most cases, no barriers exist between these areas and the entrances or building edifices. Indeed, short distances and flat walkways are

the norm to accommodate patrons, comply with handicapped requirements, and create a shopper-friendly environment.



**Figure 7 Typical Mall Indoor Parking Garage**

Like parking areas, delivery areas differ as well. Loading docks are typically located in mall basements or contiguous to mall buildings. In other instances, merchandise is delivered directly to the back of stores on ground level.

In many malls, only security grates separate stores from the common walkway. They do not have doors, glass or other “solid” separators. (Figure 8 shows a storefront with a pull-down grate above the entrance.)



**Figure 8 Typical Mall Storefront with Pull-down Gate**

Shopping centers usually have multiple entrances from parking areas, the street, mass transit, and anchor stores. The last usually have multiple entry points as well. Some malls have delivery entrances in the back of stores.

The open, airy spaces in some enclosed mall designs have mixed benefits. They can mitigate some impacts, such as dissipating the concussion from a small explosion. Gaseous releases, however, would spread more rapidly in an open area than in a confined space.

Large malls often have attached auxiliary facilities or facilities integrated into their structure, including hotels, office buildings or office space, movie complexes, and amusement areas. These facilities add to the number of entrances and exits to the mall and create other unique attributes that can be exploited by potential adversaries. These need to be examined on a case-by-case basis to determine specific vulnerabilities. Figure 9 shows the floor plan of a mall with an attached hotel. Not shown is an office building that also is attached to the facility. Figure 10 gives the floor plan of a mall with attached cinemas.

Although malls have security personnel, their major concerns have been property-related crimes, such as shoplifting, vandalism, and theft, and protection of mall-goers from assault, robbery, carjacking, rape, and other crimes against individuals. Security personnel are not oriented toward responding to terrorist-type incidents. In some malls, local police may have assigned duty, but this is not the norm.

In summation, the physical configurations and operational attributes create vulnerabilities that make protecting an enclosed shopping mall from a terrorist or other adversarial action challenging.



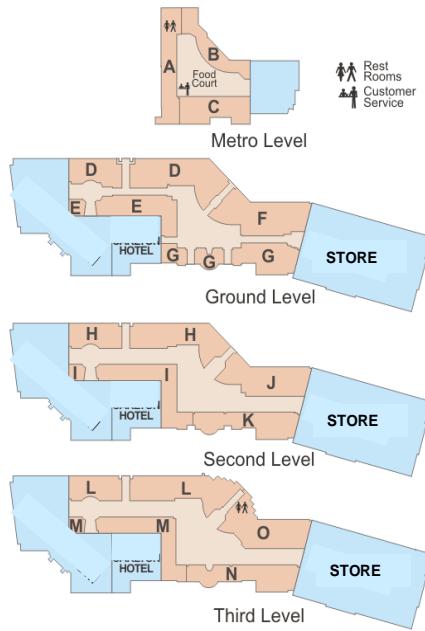


Figure 9 Typical Floor Plan of Mall with Attached Hotel

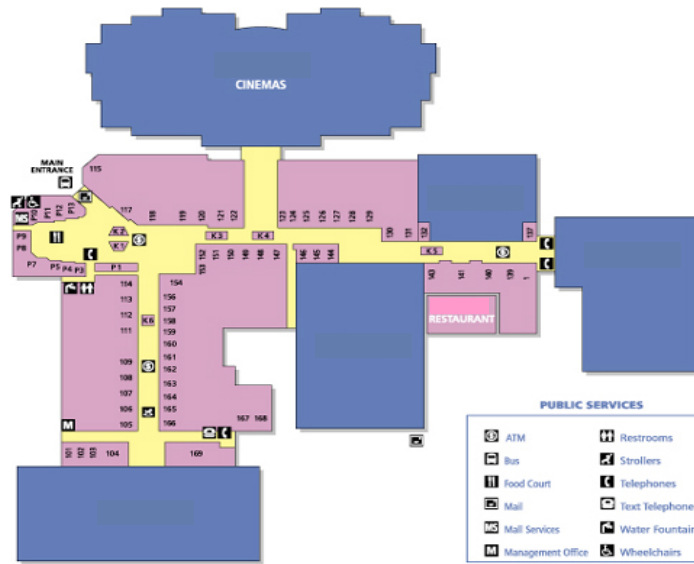


Figure 10 Typical Floor Plan of Mall with Attached Movie Theater

## Standards

Shopping malls are vulnerable to a number of natural events, such as tornados, hurricanes, and earthquakes. Building codes and construction standards have been designed and adopted to address these threats. There are also ongoing studies as to how to improve the ability of buildings to withstand the impact of tornados, microbursts, and other wind-driven events. In many ways, these are applicable to the potential structural impact of explosions caused by bombs.

Texas Tech University’s Wind Science and Engineering Research Center has studied the construction of a variety of buildings, including large malls and the potential damage that a tornado could cause to these structures as part of its Fujita Scale Enhancement Project. The damage indicators developed during this activity are available online (see Useful Reference Material at the end of this report).

The International Code Council (ICC) is a nonprofit organization dedicated to developing a single set of comprehensive and coordinated national model construction codes. The founders of the ICC were Building Officials and Code Administrators International, Inc., International Conference of Building Officials, and Southern Building Code Congress International, Inc. These nonprofit organizations had developed three separate sets of model codes used throughout the U.S. In 1994, these groups combined to form the ICC and develop a single set of codes without regional limitations. The ICC publishes a variety of references to building codes and standards, including the International Building Code and state and local codes. It offers technical publications that cover most topics associated with building structures. It also performs technical evaluations of building plans and provides technical support to its members. The ICC home page provides links to the organization’s publications and services.

The Federal Emergency Management Agency (FEMA) has published a series of risk management manuals and primers to help develop and enhance building terrorism resistance methodologies. According to FEMA, the *Reference Manual to Mitigate Potential Terrorist Attacks against Buildings* “provides guidance to the building science community of architects and engineers, to reduce physical damage to buildings, related infrastructure, and people caused by terrorist assaults. The manual presents incremental approaches that can be implemented over time to decrease the vulnerability of buildings to terrorist threats. Many of the recommendations can be implemented quickly and cost-effectively.” FEMA states that the *Primer for Design of Commercial Buildings to Mitigate Terrorist Attacks* “introduces a series of concepts that can help building designers, owners, and state and local governments mitigate the threat of hazards resulting from terrorist attacks on new buildings.” These relatively new publications contain a wealth of information and are available online.

The United Kingdom’s Home Office has produced a detailed publication entitled, *Bombs: Protecting People and Property — A Handbook for Managers*. It was, according to its preface, “written specifically with managers in mind. The advice which it contains is relevant to all businesses and organizations.... The handbook is, of necessity, written with a wide audience in mind. It does not – cannot – address the particular circumstances of each reader.” The fourth and latest editions of the handbook are available online.

The Centers for Disease Control and Prevention, in conjunction with the National Institute for Occupational Safety and Health, issued a comprehensive report entitled, *CDC-NIOSH Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Attacks*, which details preventive steps that can be taken to reduce the likelihood and mitigate the impact of threats and potential hazards associated with chemical, biological, or radiological terrorism. Although this document discusses buildings in general rather than malls in particular, many of the vulnerabilities and recommendations are applicable. The entire document is online.

Many vulnerability studies have been published that have suggested remedies that deal with potential incidents, not terrorism-related, but with similar scenarios and consequences. Vulnerability to a fire and mitigating the effects is one example. There are obvious differences in preventive measures; however, once a fire occurs (regardless of whether the cause was a gas line leak, faulty wiring, or arson attack), facility vulnerabilities are the same. The same is true of safety measures such as sprinkler systems and fire doors. The National Fire Protection Association (NFPA) has produced many publications and reports relating to fire prevention, including codes and standards, preventive measures, and alarm and signaling systems. Links to these documents can be found at the NFPA website.

### CONSEQUENCE OF EVENT

A successful terrorist attack against an enclosed mall would cause tangible (material and physical) and intangible (psychological) consequences. In most cases, the former would correspond to the effects of a natural or accidental event. The impact would be primarily local with some regional implications. A successful or even an unsuccessful terrorist attack would have consequences well beyond the targeted facility.

On a busy day, large shopping malls are crowded with people. A catastrophic event at that time, such as a large truck bombing or the release of a biological/chemical/radiological agent throughout the building, could cause many casualties. Structural collapse could result. Hotels and office buildings attached to the mall might also be impacted. In the event of a chemical/biological/radiological release, this would be especially true if the HVAC systems were interconnected.

The most immediate effect of a catastrophic event at a mall would be on local and perhaps regional emergency service and public health resources. Emergency response plans would be initiated. A large number of fire and rescue, Hazmat, law enforcement and medical personnel, facilities, and equipment may need to be activated, which would tax the available resources. The same would be true of a natural or accidental event, such as a severe earthquake, tornado, hurricane, or fire.

Significant economic impacts would occur locally and perhaps regionally if a large mall were destroyed or incapacitated. Jobs and businesses would be lost. Insurance companies would be affected, as would the mall owners.

The most significant and widespread effect of an attack on a shopping mall would be the psychological impact. This effect could have significant economic consequences that go well

beyond the physical damages to the facility and the impact on the local area. A good example is the effect of two simultaneous terrorist attacks in 1985 at the Rome and Vienna airports. In those incidents, the casualties totaled about 20 people and the damage to the facilities was minimal; the economic consequences, however, were substantial. During the following six months, it was estimated that international tourism decreased by 23%. An analogous impact following an attack against a shopping mall might be anticipated. The effect of a sharp reduction in consumer spending could have an effect throughout the economy.

**COMMON VULNERABILITIES**

*Critical infrastructures and key assets vary in many characteristics and practices relevant to specifying vulnerabilities. There is no universal list of vulnerabilities that applies to all assets of a particular type within an infrastructure category. Instead, a list of common vulnerabilities has been prepared, based on experience and observation. These vulnerabilities should be interpreted as possible vulnerabilities and not as applying to each and every individual facility or asset. Some shopping malls have instituted security vulnerability assessment protocols, site prioritization processes, and risk-based approaches to improving security performance, including provisions to increase security measures during heightened threat conditions. The security improvements implemented by mall managers under such protocols may mitigate certain vulnerabilities listed below. This vulnerabilities list considers the issues within the physical perimeter boundaries of shopping malls. The majority of vulnerabilities present inside malls result either from the potential lack of access controls or from structural configurations that are vulnerable to bombs.*

<b>Exhibit 1 Economic and Institutional Vulnerabilities</b>	
<i>Economic and institutional vulnerabilities are those that would have extensive national, regional, industry-wide consequences if exploited by a terrorist attack.</i>	
1	An attack on a shopping mall could affect consumer-spending profiles and have a ripple effect throughout other parts of the economy.
2	Local economies would be affected most by an attack.
3	Mall-related jobs could be significantly impacted by an attack.

<b>Exhibit 2 Site-Related Vulnerabilities</b>	
<i>Site-related vulnerabilities are conditions or situations existing at a particular site or facility that could be exploited by a terrorist or terrorist group to do economic, physical, or bodily harm or to disable or disrupt facility operations or other critical infrastructures.</i>	
<b>Access and Access Control</b>	
1	Malls encourage individuals to come to the facility by creating an open, friendly structure. Large numbers of people enter and exit malls each day.
2	People carry packages of all shapes and sizes into and out of malls each day.
3	Malls have numerous entrances and exits for customers, employees, and deliveries. Deliveries are made to mall tenants by a multitude of companies.
4	Public roads and/or mass transit must be in close proximity to a mall, allowing easy access.
<i>(Continued on next page.)</i>	



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LAW ENFORCEMENT SENSITIVE

5	Most malls have large parking areas with many vehicles coming and going all-day. Parking areas are close to the facility to allow easy access. In some cases, parking garages are contiguous to the structure or incorporated into it.
6	Loading docks and other areas for delivery are usually contiguous to the structure or incorporated into it.
7	Vehicles stop to let passengers disembark in front of entrances. There are few if any physical barriers between parking areas/roadways and ground-level entrances/exits.
8	Contractors may service mall infrastructure (e.g., HVAC and other systems).
<b>Operational Security</b>	
9	The number of security personnel is based on property-related crimes, such as shoplifting, vandalism, and theft, and protection of mall-goers from assault, robbery, carjacking, rape, and other crimes against individuals.
10	Security personnel are trained to monitor the facility for property-related crimes and crimes against individuals.
11	The placing and use of surveillance cameras for parking areas and inside mall common areas may not cover all areas.
12	Background checks on people working at malls may be limited.
<b>Emergency Planning and Preparedness</b>	
13	A major attack on a large shopping mall may stress the available emergency response resources.
14	Emergency planning at a mall is usually geared toward fires and natural disasters and may not be practiced routinely.

<b>Exhibit 3 Interdependent Vulnerabilities</b>	
<i>Interdependency is the relationship between two or more infrastructures by which the condition or functionality of each infrastructure is affected by the condition or functionality of the other(s). Interdependencies can be physical, geographic, logical, or information-based.</i>	
<b>General</b>	
1	In malls with connected hotels, office buildings, or other facilities, emergency and back-up systems may be located in the same central core as the primary utilities, making both vulnerable to the same structural damage.
2	Disruption of any, or all, utilities could disrupt operation of mall services.
<b>Natural Gas</b>	
3	Natural gas service to the mall could be interrupted, causing loss of heating capability.
<i>(Continued on next page.)</i>	

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LAW ENFORCEMENT SENSITIVE

4	Tampering with the natural gas supply system could occur, thereby creating fires or explosions.
<b>Water</b>	
5	Tampering with the water supply systems could occur, thereby inhibiting fire-fighting capability.
6	Drinking water supplies could be contaminated.
<b>Electric Power</b>	
7	Electric power service could be disrupted.

## RELATED INCIDENTS

No significant terrorist attacks against an enclosed mall have occurred domestically; however, there have been incidents against malls and analogous targets overseas and within the U.S. that correspond to most of the threat categories outlined earlier in this report. These events demonstrate the dangers faced by malls and illustrate how the identified vulnerabilities can be or have been exploited by adversarial elements.

- In 1999, a self-proclaimed revolutionary group protesting growing consumerism in Russia claimed responsibility for a bomb that shattered a shopping mall in the heart of Moscow. The blast in a video game arcade in the underground mall showered an adjacent row of fast food restaurants with glass and metal shards when it was thronged with tourists and shoppers [<http://deseretnews.com/dn/view/1,1249,115006492,00.html>].
- A baby girl and a woman died and more than 40 other Israelis were injured in a suicide bomb attack at a shopping mall outside Tel Aviv in May 2002. Officials said the bomber blew himself up next to a café at the entrance to the Em Hamoshavot mall in Petach Tikvah, about six miles east of Tel Aviv. Eyewitnesses said that the bomber, who was wearing overalls, was turned away when he tried to enter a supermarket. Officials said that he then targeted a group of people gathered outside the café. This incident occurred despite access controls and a population with high security awareness of the threat [<http://www.usatoday.com/news/world/2002/05/27/israel-bomb.htm>].
- An illegally parked, bomb-laden truck was apparently responsible for setting off an explosion that destroyed a shopping center and injured more than 200 people in Manchester, U.K., in 1996. The vehicle had been ticketed 2 hours before the blast and had been photographed by the center's video surveillance camera [<http://www.cnn.com/WORLD/9606/16/britain.bomb/>].
- Islamic extremists were suspected of being responsible for an explosion in the women's restroom of the SM Megamall in Manila, the Philippines, in May 2000. This incident killed 1 person and injured 11 others. Police and intelligence agents arrested the suspects in August 2003 [[http://www.inq7.net/nat/2003/aug/06/nat\\_4-1.htm](http://www.inq7.net/nat/2003/aug/06/nat_4-1.htm)].
- A teenage bomber was behind a blast at a shopping mall in October 2002 on the outskirts of Helsinki, Finland, that killed him and 6 other people. Up to 80, including many children, were injured in the explosion at the three-story Myyrmanni Shopping Mall in Vantaa, one of Finland's largest shopping malls [<http://news.bbc.co.uk/2/hi/europe/2322275.stm>].
- A radical environmental group claimed responsibility for the April 2001 attempted arson at a Nike store in the Outlets of Albertville Mall in Minnesota. The group was unsuccessful in setting fire to the store's roof.

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LAW ENFORCEMENT SENSITIVE

- While not in a mall, animal rights extremists a number of years ago planted and set off incendiary devices in a department store in San Francisco (similar actions have been conducted elsewhere) as part of an ongoing campaign against the fur industry. These devices ignited after the store closed. The resulting fire was extinguished by the store's sprinkler system [<http://www.herald-journal.com/archives/2001/stories/ars.html>].
- Two teenage boys faced arson charges after attempting a fiery stunt in November 2003 on the roof of the Orange Park, Florida, shopping mall. The incident occurred about an hour after the mall had closed. Although security guards apprehended the two boys, they were not discovered until after they had accessed the roof and implemented their action [[http://www.sptimes.com/2003/11/04/State/Boys\\_face\\_arson\\_charg.shtml](http://www.sptimes.com/2003/11/04/State/Boys_face_arson_charg.shtml)].
- An alert security guard spotted a suspicious object in the underground garage of a major Tel Aviv, Israel, shopping mall/office building complex. Police "sappers" were immediately notified, the building was cleared, and lunchtime traffic diverted in preparation for a possible blast. The suspicious object turned out to be a small bomb. The device was considered too small to cause serious damage to the building and apparently fit with other criteria belonging to previous criminal underworld bombings. Israeli police opened an investigation of the incident, as to both how a vehicle with a bomb could have entered the complex and to whom the vehicle belonged. Due to the facility's security cameras, which photograph each car entering the complex, the investigation was expected to prove relatively simple [<http://www.jpost.com/servlet/Satellite?pagename=JPost/JParticle/ShowFull&cid=1075263107435&p=1008596981749>].
- Thirteen people died when unidentified assailants hurled Molotov cocktails into a shopping center in Istanbul, Turkey, in March 1999. Quoting rescuers, the semi-official Anatolia news agency said 2 people burned to death and another 10, who apparently fled to the top floor to escape the flames, died of smoke inhalation. It did not say how the 13th victim died. Most of the victims were women. The mall was crowded with Saturday shoppers. People fled in panic as the fire spread through the modern, glass-walled mall. The fire raged for at least 2 hours, heavily damaging the building [[http://www.turkishdailynews.com/old\\_editions/03\\_14\\_99/dom.htm](http://www.turkishdailynews.com/old_editions/03_14_99/dom.htm)].

## USEFUL REFERENCE MATERIAL

International Code Council Website [<http://www.iccsafe.org/>].

Program for the ICSC 2004 Shopping Center Security Conference, March 28–30, in Dallas Texas [<http://www.icsc.org/srch/mt/descs/2004SCS/2004SCS.pdf>].

DHS article on “Operation Dark Cloud,” August 3, 2003, exercise at Northridge Mall, Los Angeles County, California [<http://www.dhs.co.la.ca.us/ems/DMAT/DMATERS/DMATNewsletter1003.pdf>].

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*Bombs: Protecting People and Property — A Handbook for Managers* (prepared by the United Kingdom Home Office) [<http://www.ukresilience.info/contingencies/business/bombs.pdf>].

*CDC-NIOSH Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Attacks* [<http://www.cdc.gov/niosh/bldvent/2002-139.html>].

The National Fire Protection Association website [<http://www.nfpa.org/catalog/home/index.asp>].

Federal Emergency Management Agency, *FEMA 426 — Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings* [<http://www.fema.gov/pdf/fima/fema426.pdf>].

Federal Emergency Management Agency, *FEMA 427 — Primer for Design of Commercial Buildings to Mitigate Terrorist Attacks* [<http://www.fema.gov/pdf/fima/fema427.pdf>].

Federal Emergency Management Agency, *FEMA 429 — Insurance, Finance, and Regulation Primer for Terrorism Risk Management in Buildings* [<http://www.fema.gov/pdf/fima/fema429.pdf>].

Fujita Scale Enhancement Project Damage Indicators (link page), Texas Tech University Wind Science and Engineering Research Center [[http://www.wind.ttu.edu/f\\_scale/indicators.htm](http://www.wind.ttu.edu/f_scale/indicators.htm)].

Statement for the Record of Robert S. Mueller, III, Director Federal Bureau of Investigation, *On War on Terrorism*, before the Select Committee on Intelligence of the U.S. Senate, Washington, DC, February 11, 2003 [[http://www.fas.org/irp/congress/2003\\_hr/021103mueller.html](http://www.fas.org/irp/congress/2003_hr/021103mueller.html)].

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[[http://www.nlb.org/pubs/case\\_quickpayback.html](http://www.nlb.org/pubs/case_quickpayback.html)].

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[<http://www.icsc.org/srch/mt/descs/2004UV/2004UV.pdf>].

*Design Considerations for Enclosed Shopping Malls*  
[[http://www.pmengineer.com/CDA/ArticleInformation/features/BNP\\_\\_Features\\_\\_Item/0,2732,3571,00.html](http://www.pmengineer.com/CDA/ArticleInformation/features/BNP__Features__Item/0,2732,3571,00.html)].

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[<http://departments.agri.huji.ac.il/economics/pdf20117.pdf>].