THE FEDERAL PRESENCE IN THE URBAN VILLAGE

THE ECONOMIC IMPACT OF FEDERAL FACILITIES IN ARLINGTON, VIRGINIA

This report was prepared by Arlington Economic Development (AED) in support of the work of a staff task force focused on the economic, planning, and security impacts of federal facilities and offices in Arlington. A central concern of the task force was the potential impact of the September 11, 2001 terrorist attacks on security standards for federal buildings and how these more stringent standards might affect future location decisions for federal facilities. One specific aspect of this broader subject, the economic impact of the federal presence on Arlington, is the topic of this paper.

Four areas of study were deemed most important:

- The impact of the federal presence on the Arlington office market;
- The impact of federal contracting on both the office market and the local economy;
- The linkages between agencies and contractors that affect location decisions; and
- The real estate and business tax impacts of the federal presence.

This report does not address in any detail the income effects of the federal government on Arlington residents as federal employees or retirees, although these are substantial. Nor does it cover the broader impacts represented by Arlington National Cemetery, National Airport and other non-office related land uses.

The Office Market

Federal agencies occupy approximately 18.7 million square feet of office space in an Arlington market that contains some 40.5 million square feet in total. Federal office space includes 11.4 million square feet of leased space and 7.3 million square feet of owned space. The leased space alone accounts directly for one-third of the private sector office market in Arlington. This is a large market; Arlington contains more privately held office space than the downtowns in Dallas, Denver, Cleveland, Cincinnati or Miami. It is fair to say that the government dominates the office market directly, and has a nearly equal indirect impact.

The federal government owns 7.3 million square feet of office space in Arlington. The largest single facility is the Pentagon building, which alone contains 4 million square feet of office space and is reputed to be the largest office building in the world. Other major federally owned office facilities include the Navy Annex, the Defense Information Systems Agency (DISA), the State Department Foreign Affairs Training Center, the Army National Guard Readiness Center, and the Federal Deposit Insurance Corporation (FDIC). In addition, the Fort Myer military installation, Arlington National Cemetery, and Ronald Reagan Washington National Airport cover some 1,673 acres, although these uses have little impact on the office market. Overall, the federal government owns 17 percent of all land in Arlington County.

The location of federally owned and leased space is shown in Table 1. Nearly all federally owned property is outside Arlington's Metro corridors, with the exception of the FDIC facility in Virginia Square.[1] The largest concentration of federally leased space is in Crystal City, adjacent to the Pentagon. Most of the federally leased space in this submarket is occupied by a variety of defense related agencies, although the largest single federal tenant in Crystal City is the Patent and Trademark Office (PTO), which is not.[2] Altogether, federal leases account for nearly 57 percent of the entire Crystal City submarket. The adjacent Pentagon City submarket is dominated by the federal presence, with the Transportation Security Administration (TSA), part of the new Department of Homeland Security, and by the U.S. Marshall's Service and the Drug Enforcement Administration (DEA). These agencies lease approximately 76 percent of the Pentagon City submarket, with the remaining space occupied by government contractors such as RAND.

The Rosslyn-Ballston (R-B) Corridor market contains some 4.2 million square feet of federally leased office space. The largest concentration is in Ballston, which is home to the National Science Foundation, the Office of Naval Research, the U.S. Fish and Wildlife Service and other smaller agencies leasing a total of 1.5 million square feet.

Most R-B Corridor submarkets have a significant federal presence. Rosslyn contains major facilities for the State Department and the U.S. Postal Service. Clarendon has the Defense Intelligence Agency as the largest single tenant, and Virginia Square is centered on the Defense Advanced Research Projects Agency (DARPA) and the FDIC.

Table 1: The Federal Office Market
Arlington, Virginia - 2003
*Federal Rentable Square Feet (RSF)**

Area	Leased	Owned	Total Federal
R-B Corridor	4,246,796	358,798	4,605,594
Rosslyn	2,433,564	0	2,433,564
Court House	38,330	0	38,330
Clarendon	203,185	0	203,185
Virginia Square	70,016	358,798	428,814
Ballston	1,501,701	0	1,501,701
JD Corridor	7,121,368	0	7,121,368
Pentagon City	1,103,319	0	1,103,319
Crystal City	6,018,049	0	6,018,049
Other Areas	0	6,879,358	6,879,358
Arlington County	11,368,164	7,238,156	18,606,320

**RSF is the government equivalent of RBA as used in commercial real estate*
Sources: General Services Administration; Washington Headquarters Service; National Capital Planning Commision; Arlington Economic Development

FDIC is the only major federally owned facility in the Metro corridors.

Some "high value" agencies such as NSF fit comfortably into the urban environment.

1 Although the Pentagon has its own Metro stop, it is a federal campus that precludes ancillary development.
2 PTO is moving to Alexandria beginning in December 2003.

It is clear from Table 2 that the Department of Defense (DoD) dominates the overall Arlington office market, with some 58 percent of all federal leasing. PTO is second, followed by the State Department. In total, there are a dozen agencies that lease or own more than 200,000 square feet of office space in Arlington. In contrast, only one private or non-profit sector organization, Verizon, currently leases as much as 200,000 square feet of office space.

Table 2: Federal Office Space Occupancy
Arlington, Virginia - April 2003

Federal Department or Agency	USF* Leased	USF* Owned	USF* Total
Department of Defense	4,004,212	5,369,450	9,373,662
US Patent & Trademark Office	1,924,797	0	1,924,797
State Department	899,451	408,000	1,307,451
Drug Enforcement Administration	522,578	0	522,578
National Science Foundation	499,088	0	499,088
Transportation Security Administration	429,642	0	429,642
Federal Deposit Insurance Corporation	0	298,863	298,863
Environmental Protection Agency	349,368	0	349,368
US Marshals Service	269,889	0	269,889
United States Postal Service - OIG	218,909	0	218,909
Federal Supply Service	226,393	0	226,393
Defense Information Systems Agency	0	204,600	204,600
US Fish & Wildlife Service	153,878	0	153,878
US Department of Agriculture	102,678	0	102,678
Federal Aviation Administration	0	100,000	100,000
Immigration & Naturalization Service	95,143	0	95,143
Department of Labor	80,502	0	80,502
US Coast Guard	76,903	0	76,903
Internal Revenue Service	75,934	0	75,934
Vacant	54,269	0	54,269
Other	189,529		189,529
Total	**10,173,163**	**6,380,913**	**16,554,076**

** Useable Square Footage (USF) is approximately 87.5% of Rentable SF, except when specified otherwise by agency.*
Source: General Services Administration; Washington Headquarters Service; Arlington Economic Development

Table 3: Projected Federal Lease Expirations*
Arlington, Virginia - 2004 through 2008

Area	2004	2005	2006	2007	2008	Total
Ballston	49,728	0	194,141	0	161,437	405,306
Virginia Square	0	0	0	0		0
Clarendon	0	0	0	0	203,185	203,185
Court House	0	0	0	38,330	0	38,330
Rosslyn	431,901	123,024	26,578	248,789	586,483	1,416,775
Pentagon City	78,449	52,641	0	0	481,229	612,319
Crystal City	1,811,202	1,110,824	599,436	481,802	914,588	4,917,852
Total	**2,371,280**	**1,286,489**	**820,155**	**768,921**	**2,346,922**	**7,593,767**

** in square feet*
Source: General Services Administration; Arlington Economic Development

The actual amount of federally owned or leased space provides only a portion of the impact of the federal presence on the office market. Federal contract work performed in Arlington is nearly equally important in its office market impact. Federally induced demand for office space is estimated to be approximately 11,750,000 square feet based on FY 2002 contract awards. It is not accurate, however to add this level of induced space occupancy to the federally leased total, since much contract work is conducted by contractors working in federally leased space. For example, federal contractors working for DARPA and doing work on-site, occupy approximately half of the space leased by DARPA. There are two primary reasons for this: agencies want their contractors nearby to improve communications and coordination, especially where the work is secret or sensitive; or because federal buying power may result in lower overhead costs than the contractors can achieve otherwise. To avoid double counting, it is necessary to determine how much of this induced demand is captured in federally leased space. Based on estimates by AED, approximately 30 percent or 3.5 million square feet of the induced office space is accommodated through the use of federally leased space by government contractors. Contractors lease another 8.2 million square feet directly. Therefore, the direct and indirect (induced, but not multiplied) impact of the federal presence on the Arlington real estate market is estimated at 26.8 million square feet or two-thirds of all office space.

The leased portion of the federal office market is dynamic, with leases expiring, renewing, or being re-competed constantly. Table 3 indicates that between 769,000 and 2,371,000 square feet of federally leased space will come up for renewal each year between 2004 and 2008. In total, some 7.6 million square feet of federal leases expire over the next five years, representing about two-thirds of the entire federally leased inventory. While many of these leases will be renewed, or new leases will be signed within Arlington, not all of them will be, leaving the County at risk for losing a substantial portion of it's federal inventory in a relatively short period of time.

Fully federally leased buildings often lack the urban character and street life desired in the Metro submarkets.

This building in the heart of Clarendon is illustrative of conflicts between security and the urban village concept

Losses of federal tenants, and often, associated contractors, has been the reality in Arlington over the past several years. The last round of the Base Realignment and Closure (BRAC) process resulted in the loss of 1.2 million square feet of office space previously leased by the Navy, with another one million square feet lost from contractors following the Naval Sea Systems Command to the Navy Yard in Washington, D.C. Similarly, the Patent and Trademark Office will begin a phased move of 2.3 million square feet of office space to Alexandria, VA in December 2003. Another 500,00 square feet currently leased by patent attorneys and affiliated businesses are projected to follow PTO to Alexandria. The 760,000 square feet of swing space leased for Pentagon renovations also temporarily inflates the current office market for federal space, and will assuredly be lost as construction is completed. Arlington has lost or will soon lose one-third of the directly leased federal tenant base through these three cases alone. Further, another round of BRAC is anticipated in 2004, when still more Arlington-based defense agencies may be at risk.

New federal guidelines make it increasingly difficult to meet stiffening security standards in Metro locations, which is where all of the federally leased space is located. Much of Arlington's built environment cannot meet setback requirements. Ground floor retail requirements represent significant risk from a federal security viewpoint, and shared parking under buildings is still another security factor. Further, hardening existing buildings can be prohibitively expensive, especially in leased space.

The full extent to which new building security standards will be applied is still unknown, but Arlington is at risk of losing a significant portion of its federally leased office base; a risk which is mitigated only in part by the desire of federal agencies to locate in proximity to Metro.

Employment and Payrolls

Employment is linked directly with office space leasing and occupancy. Federal employment in the Washington region has been flat since 1997. Arlington has seen a clear decline, with direct federal civilian and military employment decreasing from a high of 48,600 in 1997 to approximately 40,000 today, both uniformed and civilian. While military employment fluctuates somewhat due to the world situation, the Pentagon generally houses about 24,000 uniformed and civilian DoD employees. This number has been down by at least one-fifth as the renovation of the building proceeds, with many of those employees displaced to swing space in other Arlington locations. Another 2,600 are deployed at other Arlington locations such as Ft. Myer, Henderson Hall, and DISA. It is estimated that federal DoD employment in Arlington is approximately 27,000.

Federal civilian employment is difficult to track, but AED estimates it to be approximately 28,850 in Arlington based on numerous sources. At an annual average salary of $77,666, Arlington-based federal agencies generate civilian payrolls of some $2.2 billion annually.[3] While not all recipients are Arlington residents, many are, with

3 Based on reports from the Department of Defense and the Office of Personnel Management.

perhaps as many as 30 percent of these employees living in Arlington.

Federal civilian employees living and working in Arlington earn approximately $663 million in direct wages. The federal influence is also felt in another way, in that federal civilian workers living in Arlington but working elsewhere in the region bring in another $1.6 billion in income to Arlington. When contractor employees are added, Arlington residents receive another $1.1 billion in payroll dollars indirectly from the federal government. Overall, it is estimated that one fourth of the local payroll wage base of Arlington households is derived from direct or induced federal sources.

Federal Procurement

Federal procurement comprises a significant portion of the Arlington economy, just as it does throughout the region. Arlington's share of federal procurement spending within the Metropolitan Washington region in FY 2002 reached 10.2 percent, up from 8.9 percent a decade earlier, even though Arlington's share of the regional office and employer market declined over this period due to substantial growth in the outer suburbs. Total federal procurement from Arlington companies eclipsed $3.8 billion in 2002.

Much of this federal procurement has been through the DoD, which bought $2.24 billion worth of goods and services from Arlington companies. Arlington's share of the region's total defense related contracting is 14.1 percent. Defense spending actually flattened between 1995 and 2001 before increasing by 58 percent in 2002. The war against terrorism and the initiation of the Department of Homeland Security surely affected defense spending in 2002 and will likely do so even more in 2003.

The type of procurement also has an affect on the impact on the local economy. A study by Dr. Stephen Fuller for the National Capital Planning Commission found that research and development expenditures had a multiplier that was greater than that for the procurement of services or supplies.[4] Arlington's share of regional research and development contracts has more than doubled over the 1990 to 2000 decade, growing from 6.5 percent to 14.8 percent. Procurement of supplies has also proportionally increased, growing form 3.3 percent to 8.7 percent over the same period. Services contracting has grown less than other categories of procurement, but still represents a regional share of more than 11.1 percent, up from 8.7 percent a decade earlier.

The largest federal contractor in Arlington and to Arlington firms is the DoD. Approximately 59 percent of all local federal procurement, $2.24 billion, is derived from DoD. In addition to the Pentagon itself, this includes the procurement of a number of DoD agencies headquartered in Arlington such as DARPA, the Office of Naval Research (ONR), the Air Force Office of Scientific Research (AFOSR) and DISA.

Table 4: Total Federal & Defense Procurement
Arlington, Virginia & Metropolitan Washington 1993 - 2002

	Total Federal Procurement			Defense Procurement		
Fiscal Year	DC Region (000's $)	Arlington County (000's $)	Arlington County Share	DC Region (000's $)	Arlington County (000's $)	Arlington County Share
1993	$16,161,298	$1,433,543	8.9%	$7,688,193	$921,160	12.0%
1994	$17,876,310	$1,580,445	8.8%	$8,658,376	$1,058,822	12.2%
1995	$19,375,499	$1,837,544	9.5%	$9,080,034	$1,201,634	13.2%
1996	$21,059,930	$1,995,203	9.5%	$11,036,399	$1,292,010	11.7%
1997	$22,004,032	$1,948,104	8.9%	$11,147,085	$1,199,491	10.8%
1998	$24,410,269	$2,279,530	9.3%	$11,408,336	$1,290,999	11.3%
1999	$26,239,038	$2,403,252	9.2%	$11,859,254	$1,527,357	12.9%
2000	$29,231,792	$2,659,125	9.1%	$12,618,450	$1,409,595	11.2%
2001	$32,333,085	$3,163,259	9.8%	$12,857,031	$1,418,982	11.0%
2002	$37,320,132	$3,807,073	10.2%	$15,941,597	$2,240,945	14.1%

Source: U.S.Department of Commerce, Consolidated Federal Funds Report

DOD procurement exceeded $2.2 billion for Arlington contractors in FY 2002.

4 The Impact of Federal Procurement on the National Capital Region, October 2002, p. 32.

In addition to DoD, the General Services Administration contracts for nearly $500 million in services, followed by the Department of Transportation, the Commerce Department, the Justice Department and the State Department, each spending more than $100 million annually in Arlington. Arlington-based contractors as a whole work for virtually every federal agency in the region. Local federal procurement is expected to grow further in the next several years as military and homeland defense spending reach unprecedented levels.

Cluster Effects

It is often taken for granted that federal contractors tend to locate in the immediate vicinity of their agency clients. For instance, there are concentrations of DoD contractors in Crystal City near the Pentagon and a group of DARPA contractors in Virginia Square proximate to DARPA headquarters. Anecdotal evidence indicates that this cluster effect is common, but how intense and dense is it in reality?

AED looked at contract activity at five federal agencies headquartered in Arlington, which were believed to be the center of such clusters. Based on contract awards over the past three years, the number of contractors located within Arlington associated with each agency ranges from 7 to 41. For example, there are 18 firms with DARPA contracts located within Arlington, and 41 firms who have contracts with ONR.

While there were pronounced cluster effects evident within the submarkets, they appear to be more uneven than expected. For instance, while more than half of the Arlington-based contractors of the Missile Defense Agency (MDA) were located in the Crystal City submarket and one-third of DARPA's contractors were located in Virginia Square, less than one-fifth of ONR's contractors leased space in Ballston.[5] Only one in ten AFOSR contractors was located in the same submarket as the agency. The profile of the cluster effect of each agency differs significantly.

There is evidence that losing an agency in the center of a cluster affects the location of associated contractors. For example, NAVSEA contractors left Crystal City when the agency moved to the Washington Navy Yard at a ratio of nearly one square foot of contractor space per square foot of agency space. The anticipated move of the Patent and Trademark Office will similarly result in substantial relocation, as many of the largest patent firms have already announced relocations to Alexandria. A reverse way of looking at cluster effects is that when contractors follow the relocation of an agency, strong linkages must exist.

One reason that the cluster effect may not be as direct and as strong as originally suspected is that the same contractor often works for multiple agencies. For example, there are six Arlington contractors that work

Table 5: Federal Procurement by Agency
Arlington, Virginia - FY 2002

Contracting Federal Agency	Amount
Department of Defense	$2,239,084,000
Other than Military Departments	$1,198,322,000
Army	$528,477,000
Navy	$413,727,000
Air Force	$98,558,000
General Services Administration	$497,505,000
Department of Transportation	$318,801,120
Commerce Department	$228,807,000
Justice Department	$138,841,000
State Department	$112,985,000
Department of Interior	$49,534,000
Environmental Protection Agency	$49,472,000
Health and Human Services	$47,700,000
Labor Department	$44,346,000
National Science Foundation	$15,241,000
Treasury Department	$12,393,000
Department of Veterans Affairs	$4,814,000
NASA	$4,638,000
Energy Department	$4,554,000
Housing and Urban Development	$3,957,000
Department of Agriculture	$3,033,000
Other	$31,367,880
Total	**$3,807,073,000**

Source: Census - Consolidated Federal Funds Report

Table 6: Selected Federal Agencies and Contractors
Arlington, Virginia - FY1999 - 2003 (August)

Agency	Location	Linkages within Arlington County	Linkages within Same Submarket
DARPA	Virginia Square	18	6
ONR	Ballston	41	9
AFOSR	Ballston	10	1
MDA	Navy Annex	24	15*
NSF	Ballston	7	2

* Crystal City
Source: Arlington Economic Development

5 MDA has since relocated to Falls Church, but was housed in the Naval Annex and some Crystal City office buildings during FY 2002.

Table 7: Federal Agency - Contractor Interrelationships
Arlington, Virginia - FY 1999 - August 2003

Federal Agency	DARPA	ONR	AFOSR	MDA	NSF
DARPA	6	8	6	9	1
ONR	8	28	9	8	0
AFOSF	6	9	1	4	0
MDA	9	8	4	12	1
NSF	1	0	0	1	5

Source: Arlington Economic Development

One-third of DARPA's contractors are located in the same submarket.

exclusively for DARPA, but eight that also work for ONR, six that work for AFOSR, and nine that also work for MDA. There is high value in locating in Arlington when there are multiple client agencies in proximity, even though they may be in different submarkets. A contractor can support several agencies from a single location. Government contract firms may cluster around one client and not others based on contract requirements, convenience, security, cost, or any of several other factors.

There is clear evidence of cluster effects. It is also clear, however, that in terms of economic impact, not all agencies are created equal. AED has long used the term "high value federal agencies" to describe those that produce significant spin-off effects based on contract value, clustering of contractors, and contractor office leasing. A sample from only five of these agencies validates the existence and importance of the concept.

Fiscal Impacts

It is too simplistic to suggest that because federally owned land and buildings are tax-exempt, they have no positive fiscal impact. All occupied buildings yield some tax payments, even if indirectly. Arlington's tax yield from federal and contractor tenants varies substantially. Federally owned property yields relatively few taxes, about $.29 per square foot. Federally leased space produces taxes of about $2.71 per square foot, at least partly because a significant portion of it is occupied by contractors. The yield on contractor leased space is, of course, significantly higher at $4.16 per square foot.[6] Due to cluster effects, there would be far less federal contractor leased space in Arlington were it not for the local presence of federal agencies.

Perhaps the best illustration of the fiscal impact of federal agencies can be drawn from the cases of two agencies which have recently left Arlington, NAVSEA and PTO. NAVSEA was relocated to a federal campus, the Washington Navy Yard, as a result of the last round of base closures through the BRAC process of consolidating military commands and agencies onto military property. The Navy vacated 1.2 million square feet of leased office space in Crystal City over several quarters in 2001. It is estimated that contractors have relocated more than one million square feet of office leases from Arlington to new private office space constructed in proximity to the Washington Navy Yard. Some of the contractors that have already relocated include Anteon International, Man Tech International, EER Systems Inc., Identix Inc., General Dynamics, TWD & Associates, and ADI Technology. The non-real estate tax revenue associated with the vacated space totals some $2.1 million annually.

In this instance, the space vacated by NAVSEA was largely backfilled by the government and was used for Pentagon personnel relocated from the damaged portions of the building resulting from the September 11, 2001 terrorist attack. Subsequently, DoD has used some of the space to consolidate scattered facilities from throughout the region in greater proximity to the Pentagon. Most of the space vacated by contractors, however, has not been relet and the office vacancy rate in Crystal City has climbed to 10.8 percent after decades of low, single-digit performance.

The PTO situation is slightly different, but at the same time strikingly similar. While PTO did not face the same external pressures felt by DoD through the BRAC

6 Based on tax yields from a sample of 33 buildings in September 2003.

process, the need for more efficient space for the long term prompted relocation. The new PTO space in Alexandria begins occupancy in December 2003. Several patent firms have already moved, including Oblon, Spivak et al and Patent Publishing LLC. AED projects the ultimate loss of about 500,000 square feet of privately leased space due to relocations to Alexandria. In this case, backfill of PTO space by federal agencies is much less likely. The tax revenue associated with this loss is approximately $1 million annually, exclusive of real estate taxes.

In both cases, the office space is not really lost; it is still there to be relet and it continues to yield real estate taxes. However, many of the buildings associated with NAVSEA and PTO are older and in need of substantial upgrading. Both the public and private markets are demanding higher quality space than that represented by the Class B space being vacated. Office vacancy rates have climbed and business tax revenues have disappeared, at least until renovations are undertaken and new tenants are signed. Although the buildings remain in operation, there are temporary losses of Arlington tax receipts associated with each relocation.

Conclusions

There are several trends associated with the federal presence in Arlington that bear watching. The first is the continued outsourcing by the federal government. Direct federal employment in the region has not grown over the past decade and has actually decreased significantly within Arlington. Federal outsourcing to the private sector has been the primary source of growth in the Arlington economy in recent years and this will likely continue. So far, Arlington's share of federal contract dollars and contractor office leasing has been increasing, even as the County's share of the regional office market has declined as a result of growth in the outer suburbs. However, there is cause for concern however.

Increasing security standards will likely make the direct leasing of office properties for federal agencies more difficult.[7] Arlington's "urban village" vision is somewhat in conflict with security design guidelines, especially setback, parking, and ground floor retail requirements embedded in site plan conditions. Federal agency leases may be lost to more secure locations. This could happen quickly, with 7.6 million square feet of federal leases expiring through 2008. As this analysis has documented, there is a substantial loss of private sector jobs, leased office space, and tax receipts with each federal relocation. Some agencies are worth more than others to Arlington, because of the high contract volume they generate and the clustering of their contractors. However, some of the highest value agencies are also the most vulnerable and require the greatest security. Many of these will likely relocate when their leases expire. Both DIA and ONR for instance, are in the federal capital facilities budget for new buildings on secure federal reservations. When agencies relocate, the chances of their contractors following is very high. Creative and proactive solutions to the conflicts represented by tightening security requirements are needed if Arlington is to retain major portions of its federal base.

Arlington has a privately owned office base that exceeds 33 million square feet. Federal agencies and contractors occupy 60 percent of this space. This office base is aging. Approximately 29 percent of Arlington's stock is over 30 years old. Some 35 percent is considered Class B space. Arlington cannot rely solely on the non-federal sectors to absorb the entirety of the potential office space losses from lapsed federal leases. Although some progress was made in the late 1990s to broaden Arlington's industry base and widen the non-federal market, the "dotcom bomb" and subsequent national recession greatly reduced this activity. Only Arlington's strong federal base prevented the type of office market collapse prevalent in the remainder of the region over the past three years. If Arlington is to remain economically strong, a strategy that includes the following elements will be needed:

- Planning solutions to the conflicts created by increased security standards;
- Incentives to upgrade or redevelop aging buildings, making them attractive to both public and private sector tenants; and
- An ambitious promotional effort aimed toward the retention and attraction of high-value federal agencies as well as emerging technology firms.

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7 See *Unified Facilities Criteria: DoD Minimum Antiterroism Standards for Buildings*, July 31, 2002 and *FEMA 426: Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings*, June 2003.