2.1 OVERVIEW OF POSSIBLE THREATS

This primer addresses several types of terrorist threats, which are listed below.

Explosive Threats:

- Vehicle weapon
- Hand-delivered weapon

Airborne Chemical, Biological, and Radiological Threats:

- Large-scale, external, air-borne release
- External release targeting building
- Internal release

Although it is possible that the dominant threat mode may change in the future, bombings have historically been a favorite tactic of terrorists. Ingredients for homemade bombs are easily obtained on the open market, as are the techniques for making bombs. Bombings are easy and quick to execute. Finally, the dramatic component of explosions in terms of the sheer destruction they cause creates a media sensation that is highly effective in transmitting the terrorist's message to the public.

2.2 EXPLOSIVE ATTACKS

From the standpoint of structural design, the vehicle bomb is the most important consideration. Vehicle bombs are able to deliver a sufficiently large quantity of explosives to cause potentially devastating structural damage. Security design intended to limit or mitigate damage from a vehicle bomb assumes that the bomb is detonated at a so-called critical location (see Figure 2-1). The critical location is a function of the site, the building layout, and the security measures in place. For a vehicle bomb, the critical location is taken to be at the closest point that a vehicle can approach, assuming that all security measures are in place. This may be a parking area directly beneath the occupied building, the loading dock, the curb directly outside the facility, or at a vehicle-access control gate where inspection takes place, depending on the level of protection incorporated into the design.

Another explosive attack threat is the small bomb that is hand delivered. Small weapons can cause the greatest damage when brought into vulnerable, unsecured areas of the building interior, such as the build-

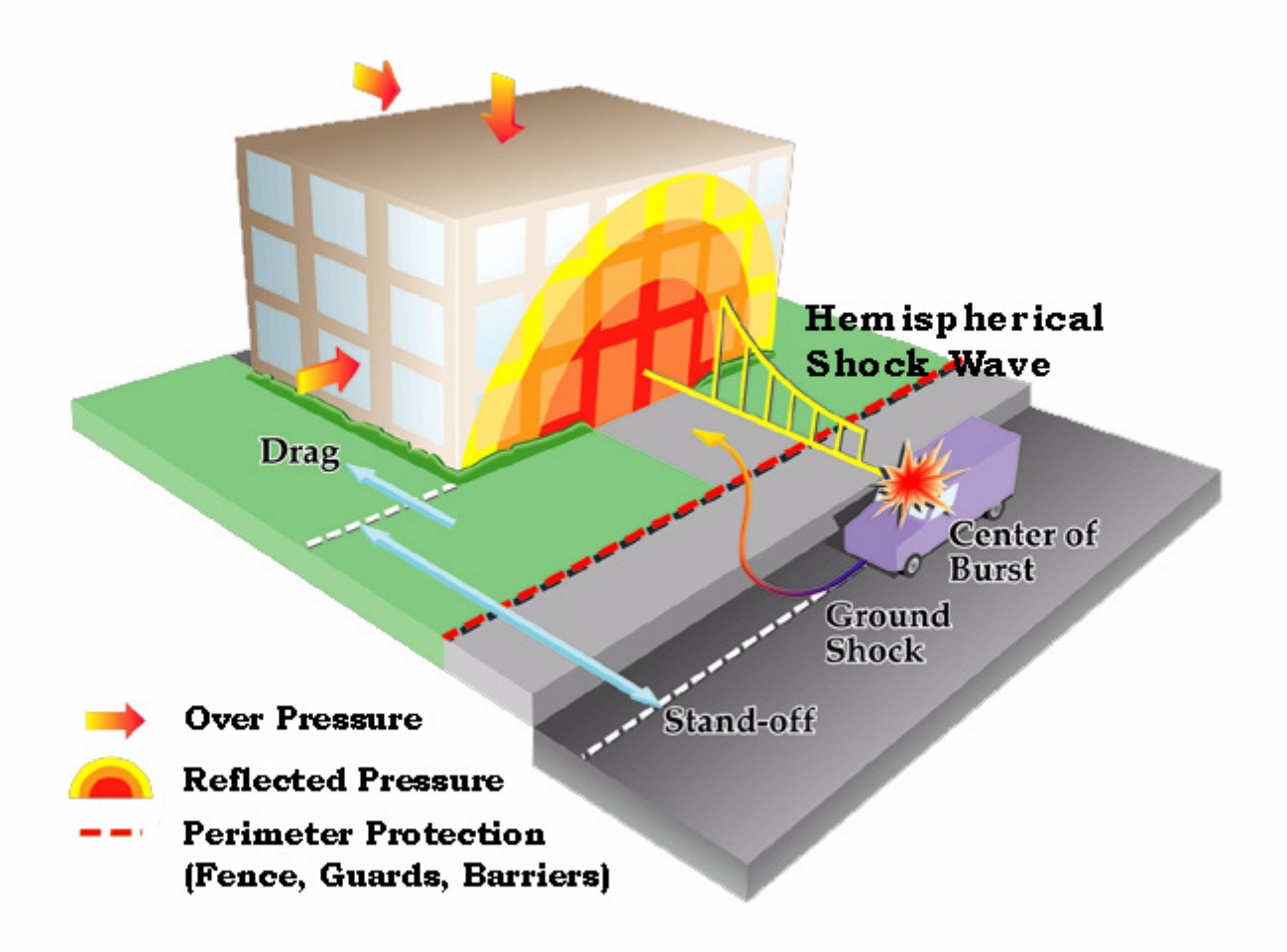

Figure 2-1 Schematic of vehicle weapon threat parameters and definitions

ing lobby, mail room, and retail spaces. Recent events around the world make it clear that there is an increased likelihood that bombs will be delivered by persons who are willing to sacrifice their own lives. Hand-carried explosives are typically on the order of five to ten pounds of TNT equivalent. However, larger charge weights, in the 50 to 100 pounds TNT equivalent range, can be readily carried in rolling cases. Mail bombs are typically less than ten pounds of TNT equivalent.

In general, the largest credible explosive size is a function of the security measures in place. Each line of security may be thought of as a sieve, reducing the size of the weapon that may gain access. Therefore the largest weapons are considered in totally unsecured public space (e.g., in a vehicle on the nearest public street), and the smallest weapons are considered in the most secured areas of the building (e.g., in a briefcase smuggled past the screening station).

Two parameters define the design threat: the weapon size, measured in equivalent pounds of TNT, and the standoff. The standoff is the distance measured from the center of gravity of the charge to the component of interest.

The design weapon size is usually selected by the owner in collaboration with security and protective design consultants (i.e., engineers who specialize in the design of structures to mitigate the effects of explosions). Although there are few unclassified sources giving the sizes of weapons that have been used in previous attacks throughout the world, security consultants have valuable information that may be used to evaluate the range of charge weights that might be reasonably considered for the intended occupancy. Security consultants draw upon the experience of other countries such as Great Britain and Israel where terrorist attacks have been more prevalent, as well as data gathered by U.S. sources.

To put the weapon size into perspective, it should be noted that thousands of deliberate explosions occur every year within the United States, but the vast majority of them have weapon yields less than five pounds. The number of large-scale vehicle weapon attacks that have used hundreds of pounds of TNT during the past twenty years is by comparison very small.

The design vehicle weapon size will usually be much smaller than the largest credible threat. The design weapon size is typically measured in hundreds of pounds rather than thousands of pounds of TNT equivalent. The decision is usually based on a trade-off between the largest credible attack directed against the building and the design constraints of the project. Further, it is common for the design pressures and impulses to be less than the actual peak pressures and impulses acting on the building. This is the approach that the federal government has taken in their design criteria for federally owned domestic office buildings. There are several reasons for this choice.

1. The likely target is often not the building under design, but a high-risk building that is nearby. Historically, more building damage has been due to collateral effects than direct attack.
2. It is difficult to quantify the risk of man-made hazards. However, qualitatively it may be stated that the chance of a large-scale terrorist attack occurring is extremely low. A smaller explosive attack is far more likely.
3. Providing a level of protection that is consistent with standards adopted for federal office buildings enhances opportunities for leas-

ing to government agencies in addition to providing a clear statement regarding the building's safety to other potential tenants.

4. The added robustness inherent in designing for a vehicle bomb of moderate size will improve the performance of the building under all explosion scenarios.

2.3 FURTHER READING

Technical Support Working Group, ___, *Terrorist Bomb Threat Stand-Off Card with Explanation of Use*, Technical Support Working Group, Washington, D.C. http://www.tswg.gov/tswg/prods_pubs/newBTSCPress.htm

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