



1-10 CONSIDERING BRIDGE SECURITY DURING DESIGN

In recent years human-induced threats against structures have become a concern for the Department. This memorandum addresses when and how the inherent vulnerability of bridges to such potential threats should be considered during the design of new bridges, bridge widenings, or bridge rehabilitation projects.

Human-induced threats include “carried and placed” bombs, vehicle bombs, intentional vehicle or ship collisions, intentional fires and other related activities.

There are some general common-sense things that should be considered during the design phase of all structures. In general, public access to bridges should be limited to the traveled way. Example of details to consider include: locating box girder access openings away from abutments where the soffit is close to the ground; providing locking mechanisms on deck access openings; placing screens at soffit vents near abutments, and; preventing access to girder flanges and maintenance walkways at abutments.

Project-specific mitigation measures for addressing intentional threats will typically be limited to a few structures that are considered critical to the transportation network such as relatively large structures in or near metropolitan areas. A determination of when mitigation measures are required will be made at the Office Chief level during initial project planning and Type Selection preparation. In such cases discussions would involve District management, Traffic Operations, Structure Maintenance and Investigations, Structure Design, and the State Bridge Engineer.

If specific mitigation measures are determined to be warranted, the following strategies should be considered as a first priority:

- **Maximize potential weapon standoff distance** to key structural members or mechanical systems via various types of barriers.
- **Deny access** to key points of vulnerable structural and mechanical systems through the installation of locks, caging and various types of fencing.
- **Minimize “time-on-target”** via real-time intrusion detection and surveillance systems and communications to security response entities.



Secondly, when it is cost-effective, designers should consider selective protection of the structural integrity of key members against collapse by strengthening key substructure members and/or employing blast shielding.

Again, project-specific mitigation measures should only be considered for those few structure which have been determined by Department management to warrant specific attention during the design phase.

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