

Chapter 4
Test Cases

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Test Cases

INTRODUCTION

The test cases illustrate site security improvements for hypothetical federal government buildings. They represent typical locations, common building types, and crucial site security design issues found within the GSA portfolio of federal buildings. Each test case is drawn from a number of real properties and projects, as well as nonexistent, but possible, conditions.

These test cases represent a broad array of site scenarios and solutions within the framework of the six site security zones (see Diagram 3.1, page 81). The most common issues may be illustrated in more than one test case. The structure of each test case clearly illustrates the recommended security design process outlined in Chapter 3. To streamline this *Guide*, each test case illustrates only one security design solution per zone. Of course, an actual project could have multiple security and design requirements per zone.

Process and Test Case Overview

PROCESS PHASE	TEST CASE COMPONENTS
Phase 1: Project Start	■ Introduction to Test Case
Phase 2: Multidisciplinary Assessment	■ Existing Conditions/Site Context Plan ■ Site Security Assessment Plan
Phase 3: Site Concept Investigation	
Phase 4: Site Concept Selection	■ Conceptual Strategy Plan
Phase 5: Design Studies for Project Areas	■ Project Area Design Studies
Phase 6: Final Concept Development	■ Final Concept Plan
Phase 7: Final Design and Construction Documents	
Phase 8: Project Completion and Operations	

Test cases are

- *Fictitious,*
- *Extensive, and*
- *Illustrative.*

TEST CASE STRUCTURE

Each test case contains diagrams and accompanying text that illustrate various phases of the site security design process:

1. Introduction

The introductory text lists general assumptions and existing conditions for each test case. Topics include urban and regional context, adjacent urban infrastructure and transportation systems, site circulation and parking, site constraints, a general description of building tenants and threat assessment level assignment, existing security features, description of issues, and opportunities and challenges unique to each hypothetical test case.

2. Existing Conditions/Site Context Plan

The Existing Conditions/Site Context Plan illustrates site conditions and such issues as neighboring buildings; transportation system adjacencies; building entries, exits, and service yards; pedestrian and vehicular circulation; parking; existing security elements; landscaping; and lighting. Supplementing this plan is a summary of Test Case Assumptions for each zone.

The Existing Conditions/Site Context Plan highlights two “design study project areas” that are illustrated in greater detail with plan diagrams and sketches in the fifth phase of each test case.

3. Site Security Assessment Plan

The Site Security Assessment Plan summarizes existing site conditions and indicates areas of risk, challenge, and opportunity. The accompanying text outlines the site security and design topics related to the plan.

4. Conceptual Strategy Plan

Following careful consideration of the Multidisciplinary Assessment, the team creates the Conceptual Strategy Plan. The Conceptual Strategy Plan represents the culmination of site concept investigations that test several design approaches to determine the best overall strategy. During the investigation process, the team revises,

reconsiders, and rejects various strategies, adopting the best features of each into a balanced overall plan that satisfies security issues, provides high-quality public space, and meets scope and budget requirements. At the end of this stage, the Project Team may decide to limit the design project to particular subsets of the site, based on risk prioritization, budget limitations, and phasing requirements.

5. Project Area Design Studies

The Project Area Design Studies present the project areas in further detail, using both plan diagrams and sketches of particular design elements to show existing conditions and proposed design solutions. The accompanying text describes the specific security design problems and provides the rationale behind the proposed design solutions. Not all aspects of a project will be examined at this level of detail before final concepts are established, but the most complex areas should receive this level of analysis.

6. Final Concept Plan

The Final Concept Plan develops the direction of the Conceptual Strategy Plan with careful attention to scale and detail. As the plan is prepared, the designer continues to pay attention to the existing context and the Multidisciplinary Assessment and works closely with the Project Team to develop a comprehensive and balanced design.

TEST CASE MATRIX

The Test Case Matrix (pages 108–109) summarizes site security issues, concerns, challenges, and opportunities that the test cases identify, analyze, and solve. These topics are organized by zone and may appear in the test cases within the descriptive text, in plan diagrams, or as part of Project Area Design Studies.

The project areas and topics listed in the Test Case Matrix are meant to illustrate effective approaches for similar situations. The examples do not represent an exhaustive list of issues for every project type, however, and site security design solutions should be unique to each site.



Site security design projects begin with the desire to transform existing conditions. Projects can successfully reduce risk and enhance the public realm when they are based upon meaningful security assessments, sensitivity to existing context and materials, and clear goals for desired site uses.

Overview of Test Case Topics

SITE SECURITY TOPIC	URBAN RENOVATION: SINGLE BUILDING	URBAN HISTORIC BUILDING	URBAN RENOVATION: MULTIPLE BUILDINGS	SUBURBAN CAMPUS RENOVATION	URBAN NEW CONSTRUCTION	COMMENTS
ZONE 1 Neighborhood						
Community Context	■	■	■	■	■	Community partnerships can connect the building and the site to its larger context and encourage public use.
Public Transportation	■	■	■		■	Proximity to local transportation lines should be capitalized upon.
High-Risk Adjacencies	■	■				Adjacent buildings within the optimal standoff distance should be evaluated for potential security risks.
Shared Security	■			■		Sharing security resources, such as guards or CCTV surveillance, with adjacent buildings enhances the safety of the neighborhood.
Traffic Calming				■		Traffic calming uses physical and operational methods to reduce vehicular speeds both for the safety of pedestrians and for the security of the site's perimeter.
Street Closure				■	■	The decision to vacate a street for security requirements has a serious impact on the building site and its surrounding urban environment.
ZONE 2 Standoff Perimeter						
Vehicular Standoff		■	■			Street parking regulations can help ensure that dangerous vehicles cannot park within the standoff on adjacent streets.
Vector Analysis	■		■			Vector analysis helps determine structural requirements for vehicular barriers based on angle of approach and potential vehicle size and speed.
Hardened Elements	■	■	■	■	■	Site elements such as street furniture, lighting fixtures, and planter walls can be structurally hardened to provide rated protection as an alternative to bollards.
Bollards		■	■			The selection and placement of bollards has an impact on the use of public space.
Berms				■	■	Planting areas can be graded to create raised landscape berms that serve as barriers; possible tradeoffs of visibility must be considered when using berms.
Moats	■				■	Moats are the opposite of berms. They are trenches or pits that deter approach by trapping vehicles before they reach a facility.
Collapsible Paving	■				■	Collapsible paving is a recent technology that is used to maintain openness, while providing protection from vehicular approach.
Temporary Barriers	■	■	■			If the use of temporary barriers is required, a plan for their removal and replacement must be included as part of the cost of their use.
Risk Acceptance	■	■				Careful analysis of the effectiveness of security measures relative to their cost and impact on public space may lead to risk acceptance in some cases.
ZONE 3 Site Access and Parking						
Guard Booths	■	■		■	■	Staffed guard booths typically regulate access to the site; their design should respond to the architecture of the building and neighborhood context.
Retractable Bollards					■	Retractable bollards are useful in situations where periodic vehicular access is necessary, for emergency vehicles, ceremonial motorcades, or other similar circumstances.
Automatic Gates	■					Automatic gates help regulate entry and exit and reduce the number of staffed guard points, which can be an expensive operational cost.
Multiple Vehicular Entries	■			■		Reducing the number of entry points and limiting entry to specific types of traffic can help regulate access to the site.
Vehicle Inspection Point	■					Inspection points such as sally ports allow vehicles to be screened before they enter the site; vehicle queuing is a concern with any type of screening and must be incorporated into the configuration of the inspection area.
Public Right-of-Way		■		■	■	When a public right-of-way falls within a building's standoff zone, mitigation of security risks must be carefully balanced with local transportation needs.
Loading Dock	■	■	■			Access to the loading dock should be separated from staff and visitor access.
Axial Approach	■		■			Avoid axial approaches where a vehicle can accelerate to a speed sufficient to force entry.
Emergency Access					■	Emergency access should be coordinated with local police and fire departments.
Internal Vehicular Circulation			■	■		Large sites often involve complex internal vehicular circulation, which must be coordinated with pedestrian circulation to avoid conflicts.
On-Site Parking	■		■	■	■	Parking areas on the site that fall within the building's required standoff may need to be restricted.
Off-Site Parking		■				Clear routes from off-site parking to building entries should be provided for the safety of staff and visitors.
Parking Garage				■		Secured parking structures may serve to protect the standoff perimeter, provided that they meet security criteria.

SITE SECURITY TOPIC	URBAN RENOVATION: SINGLE BUILDING	URBAN HISTORIC BUILDING	URBAN RENOVATION: MULTIPLE BUILDINGS	SUBURBAN CAMPUS RENOVATION	URBAN NEW CONSTRUCTION	COMMENTS
ZONE 4 Site						
Multiple Buildings			■	■		Multiple buildings sharing space on the same site may have different security needs, based on occupancy and degree of public use.
Gatherings/Demonstrations	■		■		■	Public spaces may serve as gathering points for large events or occasional assemblies.
Programmed Space	■		■	■	■	Public space that supports multiple activities will be fully occupied for more of the day, providing enhanced “eyes on the street.”
Security Pavilion	■				■	A security pavilion can be an effective retrofit for an older building that cannot accommodate security measures effectively because of its lobby configuration; it can also provide a secure entrance for a new building.
Queuing	■					Unmanaged queuing causes congestion and confusion.
Accessibility		■				Mandated accessibility must be incorporated into all security designs.
Wayfinding			■	■		Directional signage should address both everyday use and emergency situations.
Lighting		■	■	■		Site lighting increases the safety of pedestrian circulation, enhances visibility for security, and highlights architectural features.
Site Amenities	■	■	■	■	■	Site amenities can be hardened to act as security elements.
Water	■				■	Water can function as both a landscape feature and a security element.
ZONE 5 Building Envelope						
Multiple Building Entries	■	■	■			Multiple entry and exit points to a building present security risks and can confuse visitors.
Hardened Vestibule	■				■	A hardened vestibule creates a structurally secure space for screening visitors before allowing access to the main building.
Retail Frontage				■	■	Retail frontage on a facility's first floor can act as a secure edge by providing a hardened buffer in front of the building envelope.
Exposed Structural Elements			■			Exposed structural elements are a security risk. With some structural systems, failure of even one structural member can lead to progressive collapse.
Vent/Air Intake Exposure	■					Exposed HVAC vents or air intakes are vulnerable to airborne chemical, biological, or radiological attacks.
Camera Surveillance	■	■	■			CCTV is an important component of site and building security.
ZONE 6 Management and Building Operations						
Guard Operation	■			■	■	Frequent guard patrol of the site is an effective way to establish an on-site security “presence.”
Space Planning		■	■	■	■	Relocating vulnerable or high-profile occupants may reduce the need for expensive security measures.
Childcare Facility			■			The location of a childcare facility should be determined relative to the risk factors of the building it serves.
Parking Restrictions		■	■		■	Parking restrictions that impact public rights-of-way should be coordinated with the local department of transportation.