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A REPORT BY THE INTERAGENCY TASK FORCE OF  
THE NATIONAL CAPITAL PLANNING COMMISSION

# Designing for Security in the Nation's Capital



*Message from Richard L. Friedman  
Chairman, Interagency Task Force*

In recent years, the proliferation of makeshift security measures has had an alarming effect on the historic beauty of the Nation's Capital. Even before the 1995 bombing in Oklahoma City, Washington's streets and public spaces had become an unsightly jumble of fences and barriers. Since the September 11 terrorist attacks, the situation has only become worse with more street closings and more concrete barriers. The National Capital reflects the spirit of America, but today in Washington we look like a nation in fear. We now have a condition that must be addressed to protect our values as an open and democratic society.

We urgently need a comprehensive urban design plan that provides adequate security while at the same time enhances the unique character of the Nation's Capital. Efforts in the recent past in Washington have been piecemeal attempts to provide security for individual buildings or small enclaves. The Interagency Task Force has, over the last seven months, looked closely at the full range of interrelated planning issues and has formulated an approach that can correct years of neglect of critical urban design and security needs in a comprehensive manner. In preparing its recommendations the Task Force, which has had broad representation from both the federal and District governments and private interests, has sought solutions in the Monumental Core that provide the necessary security; that are compatible with the needs of the larger city; and that enhance the extraordinary planning tradition that for more than 200 years has made Washington a capital reflective of a great nation. We believe that the recommendations offered in this report will set the standard for 21st-century security design and will restore our public realm to one that sends a positive message to millions of people who live in, work in, and visit Washington each year.

We encourage the President and the Congress to consider these recommendations with all the urgency appropriate to the current state of security design. In the months ahead, the National Capital Planning Commission, along with its planning partners who have participated in the Task Force, looks forward to working with the President, the Congress, appropriate entities, and the public in developing and implementing the proposed Urban Design and Security Plan.

I want to thank Task Force members and participants who, in developing these recommendations and in coming to our many meetings with open minds and a common goal, have demonstrated not only creativity in resolving complex design and organizational issues, but also courage and optimism in forging a shared vision of Washington's future as the paradigm of a great nation's capital.

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## KEY FINDINGS AND RECOMMENDATIONS

- Based on legitimate security concerns, the Task Force recommends that Pennsylvania Avenue remain closed to normal city traffic at this time. If in the future, there are major positive changes in the security environment and/or risk detection technology is improved to the satisfaction of the relevant government agencies, this recommendation should be reconsidered by the Task Force.
- The Task Force recognizes, however, that this closure removes a major east-west artery from Downtown's transportation network, causing inconvenience and hardship to many DC businesses, visitors, workers and residents. The Task Force concludes that traffic congestion can be improved through a variety of transportation system management (TSM) initiatives, such as traffic signal synchronization, intersection improvements, and more active enforcement of parking regulations. The Task Force recommends immediate implementation of TSM initiatives in cooperation with city agencies. TSM measures have been successfully employed in other cities with significant beneficial results and, as stated in our comprehensive traffic study, can be accomplished within a matter of months.
- The Task Force recommends the immediate design and construction of a landscaped, civic space along the Pennsylvania Avenue right-of-way in front of the White House that respects and enhances the historic setting and views of the White House. The street would be maintained in a redesign that reflects a clear memory of its historic use and would not preclude reopening the street, staging inaugural parades, or possible construction of a tunnel. The Task Force finds that Pennsylvania Avenue in front of the White House has been unsightly and unresolved for too long. Therefore, the Task Force recommends that the street right-of-way be improved immediately; provided, however, that the federal government in allocating funds for such immediate improvements recognizes that these improvements may need to be modified or removed to permit construction of a tunnel if one is approved. Further, the federal government should recognize that the decision with respect to a tunnel option will not be negatively impacted by the cost of the improvements installed on Pennsylvania Avenue in front of the White House prior to a build/no build decision.
- The Task Force recommends implementation of a Circulator, a new transit service being planned for the downtown area on routes to be determined. A Circulator would permit a partial and limited use of Pennsylvania Avenue to allow for controlled and secure vehicular traffic in front of the White House. A Circulator would also help to mitigate the closure of Pennsylvania Avenue by restoring a cross-town transportation link and once more offer to both visitors and residents the experience of riding in front of the White House without undue security risks. The formal entrances to the White House and other public buildings in the immediate vicinity would remain accessible to approved vehicles, and the Inaugural Parade would be able to follow its traditional route.



- The Task Force finds that replacement of lost east-west transportation capacity will be required to support the city's continued growth and vitality on a long-term basis. In order to address this need, the Task Force recommends serious consideration of a tunnel within the Pennsylvania Avenue or the E Street corridors, combined with a Circulator and wider application of TSM measures. This recommendation will require detailed traffic studies (including TSM impacts), engineering, environmental, historic preservation, urban planning and cost benefit analyses in order to conclude the decision-making process. These studies should be undertaken immediately and concluded within 18 to 24 months.
- The Task Force recommends the reopening of E Street, which was closed after the September 11, 2001 attack, as soon as possible. In the future, street closures should not be relied upon as a primary security measure.
- The Task Force recommends that the National Capital Planning Commission prepare an integrated Urban Design and Security Plan for Washington's entire Monumental Core to create a secure and distinguished public realm. The plan, to be prepared in the next six months, will identify permanent security and streetscape improvements to be developed over the next three to five years. It will include a "kit of parts" - an array of landscape treatments, street furniture, bollards, etc. - and recommend design solutions for Pennsylvania Avenue, President's Park, the Federal Triangle, and the National Mall. The plan should be coordinated with City officials and with appropriate governmental agencies.
- The Task Force recommends that the planning and concept design of streetscape, landscape, and security for Pennsylvania Avenue and the Monumental Core be undertaken by the National Capital Planning Commission together with one or more nationally recognized urban designers. Project design and construction would be accomplished by an appropriate agency, such as the General Services Administration, the National Park Service, or the District of Columbia government. This unified approach will assure that the work is done properly, professionally, and not in a piecemeal fashion. It will also ensure this world class Monumental Core is built so as to be functional, attractive, cost effective and reflective of democratic values.
- The Task Force recommends that the federal government fund all costs associated with the development and ongoing implementation of the Urban Design and Security Plan, TSM measures (as identified in the traffic study), a Circulator, and tunnel environmental assessments, design, and engineering. If a tunnel is built, it should be a federal obligation to fund its construction.

## INTRODUCTION

**W**ith the spread of terrorism in recent decades, security has become an inevitable feature of modern urban life, particularly for those who live and work in the Nation's Capital. Government is now obliged to take the appropriate precautions to protect against terrorist attacks of many sorts. The September 11, 2001 strikes on the World Trade Center and the Pentagon have only served to underscore the public's recognition that security has become a fundamental requirement of American life.

In recent years, the federal government's response to the threat of terrorism has profoundly affected Washington's historic urban design and streetscape. Street closures have disrupted local business activities and increased traffic congestion. The hastily erected jersey barriers, concrete planters, and guard huts that ring our buildings and line our streets mar the beauty of the Nation's Capital. These installations communicate fear and retrenchment and undermine the basic premise that underlies a democratic civil society. Along with the general public and other federal and local agencies, the National Capital Planning Commission has become increasingly concerned about the hodge podge of solutions that have no aesthetic continuity or urbanistic integrity as each federal agency responds to its own individual security needs.

The hastily erected jersey barriers, concrete planters, and guard huts that ring our buildings and line our streets mar the beauty of the Nation's Capital.



## Task Force Formation and Participants

In October 2000, the House and Senate Committees on Appropriations, acknowledging NCPC's "unique statutory role in planning for the Nation's Capital, including the White House," requested the Commission to provide professional planning advice to Congress, the Administration, and other federal agencies on the future use of Pennsylvania Avenue in front of the White House. In response to this Congressional request the Task Force evaluated both Pennsylvania Avenue and more generally the impact of federal security measures on the historic urban design of Washington's Monumental Core.

National Capital Planning Commission members serving on the Task Force are:

Richard L. Friedman, Task Force Chairman  
Member, National Capital Planning Commission

John V. Cogbill III  
Chairman, National Capital Planning Commission

The Honorable Gale A. Norton  
Secretary of the Interior  
*represented by John Parsons, Associate Regional Director, Lands, Resources and Planning, National Park Service*

The Honorable Stephen A. Perry  
Administrator of General Services  
*represented by Anthony E. Costa, Assistant Regional Administrator, and Michael McGill, Senior Project Manager, Public Buildings Service*

The Honorable Anthony A. Williams  
Mayor of the District of Columbia  
*represented by Ellen McCarthy, Deputy Director, Office of Planning*

The Honorable Linda W. Cropp  
Chairman of the District of Columbia Council  
*represented by Robert Miller, Legislative Counsel to the Chairman*

The Task Force solicited and carefully considered the widest possible range of views on security and design matters. Heads of other federal agencies or their representatives offered invaluable input as participating, nonvoting members of the Task Force. This report reflects the views of the Task Force, but does not necessarily speak to the opinion of all who participated in this process. Participating agencies include the Department of Justice, the U.S. Secret Service, the Department of Transportation, the Commission of Fine Arts, the Architect of the Capitol, and the Advisory Council on Historic Preservation. NCPC also engaged the services of nationally recognized security, transportation, and urban design consultants.

## Scope of Work

The Task Force began its work with an initial focus on Pennsylvania Avenue in front of the White House. It quickly became apparent, however, that the future of the Avenue was only one part of a much larger issue: the urban design impacts of security measures throughout the Monumental Core. Successful solutions for Pennsylvania Avenue could only be reached in the context of a comprehensive design framework for the entire Core. Task Force Members determined that their objective was to identify urban design solutions that would set a benchmark for security design throughout the federal city.

The Task Force first convened on March 23, 2001 and has met 13 times to examine a wide range of security and design issues. Rand Corporation representatives presented their assessment of security measures in Washington and technical experts led the Task Force through tutorials on blast dynamics, state-of-the-art technologies, and building-hardening techniques. The Task Force's urban design consultants evaluated the visual impact of existing and alternative security installations in the city's Monumental Core. The Task Force examined security design studies for the Ronald Reagan Building and International Trade Center, the Justice Department Buildings, and the U.S. Capitol and evaluated new design prototypes for security installations.

Federal security agency officials briefed the Task Force on potential threats to the White House. Numerous individuals and organizations, including representatives of the National Park Service and the Federal City Council, shared with the Task Force their ideas for the future of Pennsylvania Avenue in front of the White House. Alternatives for both reopening the Avenue and for its continued interim and long-term closure were developed and analyzed. Transportation consultants provided detailed analyses of the impacts of all alternatives. A noted White House historian, representatives of the Advisory Council on Historic Preservation, and the Commission of Fine Arts presented their views on the potential effects these alternatives would have on the White House and other historic properties.

This report summarizes the findings of the Task Force regarding both Pennsylvania Avenue in front of the White House and the design of security measures throughout the Monumental Core. Based on these findings, the Task Force outlines recommendations for an Urban Design and Security Plan that will promote the safety of those who live in, work in, and visit the Nation's Capital while preserving the openness and historic design that have made Washington an expression of American ideals and one of the world's most admired capital cities.



Delta barrier at the vehicular entrance to the National Archives

Increasing security as a result of the September 11th attacks.

# SECURITY NEEDS OF THE CAPITAL CITY

## *The Call for Security*

The catastrophic September 11 attacks on the World Trade Center and the Pentagon are the most recent in a series of events of the past decade that have focused public attention on a growing national problem. A 1993 truck bomb in the garage at the World Trade Center; a 1994 single engine airplane crash into the south side of the White House; and a 1995 truck bomb at the Alfred P. Murrah Federal Building in Oklahoma City are among the incidents that prompted the General Services Administration, the State Department, the Department of Defense, the FBI, the U.S. Secret Service, and other federal law enforcement agencies to work together and with independent researchers to develop security measures in the Nation's Capital.

Terrorist activity can take many forms: personal attacks, truck and car bombs, air assaults, electronic sabotage, and biological and chemical weapons. Clearly, the physical perimeter security measures affecting streetscapes in the Nation's Capital as proposed in this report address only some of these threats. The Task Force recognizes the need for design solutions to establish stand-off zones around federal buildings in Washington's Monumental Core. These zones would provide the space for both security barriers designed to protect against vehicle threats and also for check points to screen individuals, property, and vehicles.

Jersey barriers line 23th Street, adjacent to the Harry S Truman Building (Department of State).



## *Interim Responses to the Dilemma*

Many temporary or interim security measures installed throughout the Monumental Core have or threaten to become, permanent fixtures in the city's landscape. Temporary security surrounds national monuments and public buildings and lines major avenues. Barriers and planters have been placed in response to heightened security requirements with little regard for the important streetscapes, landscapes, and other urban design factors unique to their location in the Core. For the most part, elements more suitable for a highway construction site have been used to secure sensitive historic areas of the Nation's Capital.

No location better illustrates the problem than the Washington Monument. Recently renovated to much acclaim, the Washington Monument is currently surrounded by a ring of concrete jersey barriers, and a visitor screening trailer has been placed at the entrance to the monument. These security measures severely compromise the appearance of one of our Nation's most important landmarks. The jersey barriers have been in place for half a decade with no permanent solution in sight, illuminating the difficulty of providing security in such a prominent location.

Within the historic Federal Triangle, security elements such as jersey barriers, concrete planters, and delta barriers – operable barriers that are raised and lowered to permit entry by authorized vehicles – have been used and parking lanes have been restricted or eliminated to further enhance security. Although the design of the Ronald Reagan Building incorporated thoughtfully planned security elements such as guard booths and planting beds, temporary barriers and planters have been placed around the site in response to heightened security requirements. GSA has recently proposed streetscape designs for this precinct in an attempt to ensure an attractive and secure permanent environment.

Security measures at the Washington Monument include a ring of jersey barriers and a temporary visitor screening facility.



The majestic vista envisioned by L'Enfant, from the Capitol to the White House, currently culminates in a tangle of jersey barriers, highway cones, and security vans south of the Department of Treasury Building. This disparate set of solutions compromises the unity achieved through the Pennsylvania Avenue Development Corporation's streetscape plan, developed over 25 years ago.

## Existing Policies and Guidelines

### *GSA Security Criteria*

GSA's 1997 report titled "Physical Security Criteria and Standards," forms the basis of the current federal policies and guidelines for the assessment of security risks. The report developed classifications for new construction and major alterations of federal buildings and also assigns one of five "protection levels" based on factors that include symbolic importance, the critical nature of operations, and consequences of an attack. This approach, in conjunction with a detailed risk assessment, identifies the level of appropriate protective measures to be applied to any federal facility. The levels range from A, which ascribes a "Low Level of Protection Needed"—generally used when a building is of low consequence and has no known threat—through Level E, which is defined as "Extreme Level of Protection Needed." Most of the buildings in the Monumental Core are classified as Level C or D.

### *The Threat*

The specific threat used as the design parameter for GSA protection Levels C and D is either a bomb-laden moving vehicle or a stationary (parked) bomb-laden vehicle with a time delay or remote control detonation device. GSA suggests criteria for moving and stationary exterior vehicle bombs in the form of various stand-off distances and the design of site perimeter barriers as effective deterrents. Specific criteria are included in GSA's report.

For example, requirements specified for Level D, such as a national headquarters building, include:

- A 100-foot setback from all parking or the use of compensating design measures.
- Elimination of parking and incorporation of the curb and parking lanes as a part of the stand-off distance where the 100-foot stand-off distance cannot be met.
- Perimeter barriers that stop a 12,000 lb. vehicle traveling at 50 mph.
- Vehicle arresting devices to protect garage and service areas.

GSA has developed further specifications for security zones around federal buildings falling within these protection levels. These zones correspond to building and site relationships and are discussed within the "General Security Design Solutions" section of this report.

Retractable bollards at the main entrance to the Harry S Truman Building (Department of State)



Following the September 11 attacks, New Jersey Avenue was closed in front of the Longworth and Cannon House Office Buildings.



# DESIGN SOLUTIONS FOR THE MONUMENTAL CORE

## *Urban Design Framework*

### Planning and Design for Security

Security measures help to protect citizens, elected officials, and the environments that honor and house our democracy, but they should neither dominate nor mar the appearance of the Nation's Capital – a city admired around the world for the openness and accessibility symbolized in its architecture. Indeed, the underlying premise of the following guidelines is that security measures should enhance the public environment of the city. They may do so when conceived with sensitivity and imagination, and implemented with good urban design as one of their major objectives.

This is a matter of design intent and civic ambition. A bench is expected to be comfortable to sit on, can be quite attractive, and can be engineered to withstand the force of a moving vehicle. A jersey barrier achieves the latter, but makes for a poor place to sit and is hardly admired for its beauty. Of course, a concrete barrier is less expensive than a beautifully designed bench that is also hardened to act as a security barrier. To incorporate design quality into security planning will necessitate additional funding, but will ultimately be justified on the basis of achieving a more hospitable and pleasing streetscape.

Our Nation's Capital not only requires adequate security but also deserves more robust and beautiful streetscapes. Why not combine these two worthy agendas to produce both a secure and a more distinguished public realm?

"America's Main Street" – Pennsylvania Avenue from the White House to the Capitol



### Special Streets and Contextual Zones

The Task Force recommends a framework of clearly defined special streets and contextual zones in which customized security design can be applied. Streets are the great linear connectors of our cities, the creators of important addresses, and in themselves can be active and beautifully designed spaces. Contextual zones may be understood as neighborhoods or urban communities of similar buildings, blocks, and streets. These zones are familiar to anyone who lives and works in the city; they follow traditional boundaries and major precincts. The identification of special streets and contextual zones ensures a consistent and thoughtful design for the public realm, yet avoids a one-size-fits-all approach.

Creative combinations of lighting, trees, and hospitable amenities such as benches can produce secure streetscapes worthy of the Capital.



## Special Streets

Pennsylvania Avenue, one of L'Enfant's great symbolic streets radiating from the U.S. Capitol, is America's pre-eminent public way. It is the address of the President and the route of the inaugural parade. The breadth and scale of the Avenue provide continuity to the varying array of uses, buildings, and architectural styles that are represented along this special street, but recent responses to the need for heightened security have resulted in a variety of styles of planters, bollards, streetlights, and barriers. The success of the original Pennsylvania Avenue Development Corporation (PADC) streetscape plan in unifying the Avenue has been undermined by the ad hoc implementation of security measures. The 25-year-old streetscape plan is in need of updating to include these security requirements.



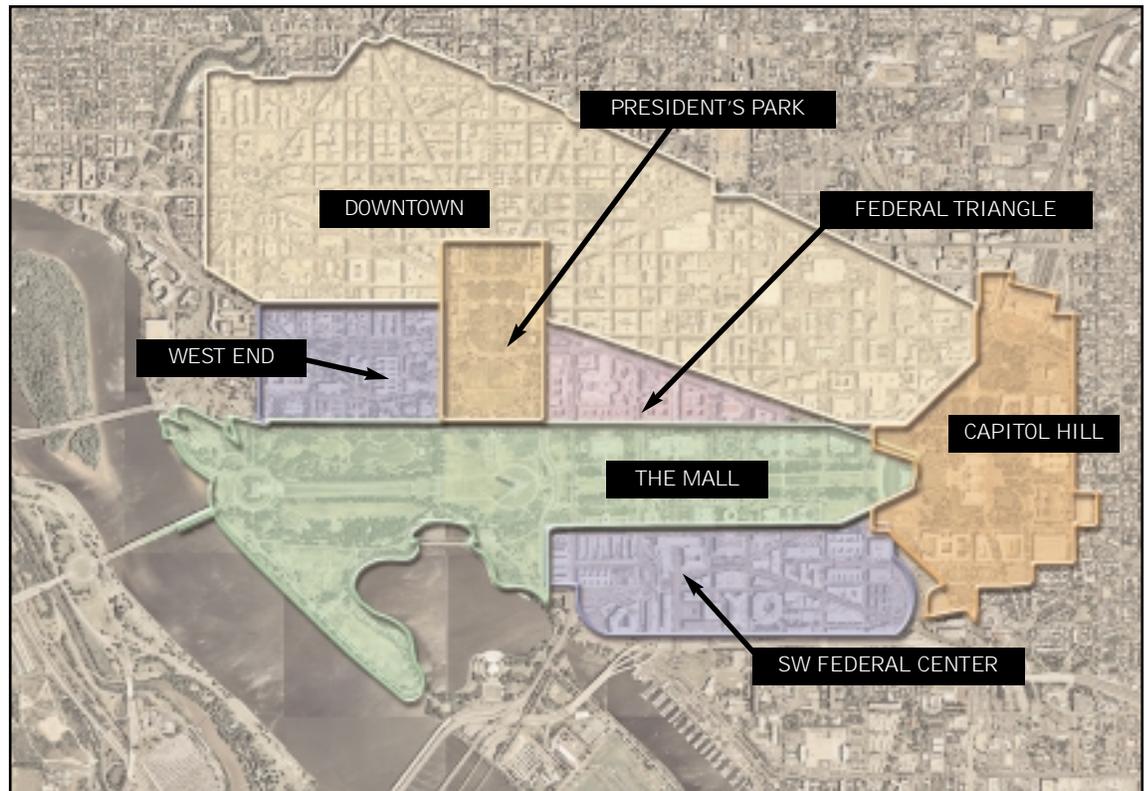
Special Streets

Symmetrically located across the Mall, Maryland Avenue extends southwest from the Capitol through the Southwest Federal Center toward the Jefferson Memorial. Unlike Pennsylvania Avenue, Maryland Avenue does not have a unified and consistent streetscape. Mid-century modern architecture and varying setbacks from the sidewalk characterize current development along Maryland Avenue. As with Pennsylvania Avenue, interim security elements, such as planters, barriers, and a disparate collection of other structures, have been placed along Maryland Avenue to protect federal office buildings. Large setbacks and generous landscaping require a different approach than that applicable to Pennsylvania Avenue and offer the opportunity to consider a cohesive design for this special street.

## Contextual Zones

The identification of six distinct contextual zones allows for the formation of overall design guidelines that are responsive to these distinct areas of the District. While similar elements may be applied to each zone, their frequency, scale, and detail may change to reflect the unique urban design and architectural character of the zone.

Contextual Zones in the Monumental Core



## President's Park

President's Park, a historic name in use more than two hundred years ago, is the precinct and grounds comprising the White House, the Eisenhower Executive Office Building, the Department of the Treasury, Lafayette Park, the Ellipse, Sherman Park, and the First Division Monument. The zone is well defined and historically distinct. Design guidelines incorporated in the "Comprehensive Design Plan for the White House and President's Park" will guide streetscape and security design for this area. Many existing significant security improvements are consistent with the Design Plan; however, interim security measures have compromised the character and setting of President's Park.

## Capitol Hill

The Hill consists of the U.S. Capitol Building, the House and Senate office buildings, the U.S. Supreme Court Building, and the Library of Congress buildings. The Capitol is a unique building with landscaping that is an extension of Olmstead's 19th-century design of the Capitol grounds. The historic character of this zone has been well documented and design guidelines are well respected. Security elements appropriate for President's Park could also be used in this zone.



## The Mall

The Mall zone consists of the green panels and National Park Service (NPS) parkland that comprise the National Mall and includes the major monuments and memorials contained within. The landscapes included in this zone vary in character from the rigid axes and neo-classical geometry of the mall to the picturesque setting of the Tidal Basin and West Potomac Park. The security requirements associated with these monuments and memorials are high and the special character of this zone must be considered. Elements appropriate to more urban zones are out of place in this context.

## Federal Triangle

The Federal Triangle is a fully built-out urban precinct of federal office buildings that followed the development of the McMillan Plan. With the exception of the turn-of-the-century Old Post Office building and the recently constructed Ronald Reagan Building, all of the buildings within this zone are of the same time period and architecture. These buildings uniformly hold the street wall and are set back only to create a unique plaza or pedestrian way. Planted areas and building plinths are ever present. A wide variety of barriers, planters, bollards, and guardhouses

are currently in place, but the uniform character of this precinct calls for coherent and equally uniform streetscape guidelines to accommodate a variety of security needs. Streetscape designs for this precinct must also be compatible with the treatment of Pennsylvania Avenue between 3rd and 15th Streets.

## Southwest Federal Center and the "West End"



The Southwest Federal Center is located on the south side of the Mall and is roughly bounded by Independence Avenue and the Southwest Freeway. The initial development of this area reflects the McMillan Plan and the architecture

of the Federal Triangle. However, the majority of the buildings are better characterized as mid to late 20th-century modern architecture. Large setbacks from the sidewalk are typical as are large landscaped plazas. Security elements and streetscape design have the potential to unify the appearance of this district.

A federal office enclave also exists in an area west of President's Park to approximately 23rd Street, NW, from Constitution Avenue north to the E Street Expressway. This area contains large federal headquarters buildings, including the Department of State, and other large institutional and association headquarters. Although somewhat disjointed, this zone contains many buildings of distinction and affords an opportunity for the establishment of a unified character and identity through the design of a consistent streetscape.

## Downtown

The downtown area is roughly bounded by Pennsylvania Avenue on the south, Massachusetts Avenue on the north, and runs from approximately 3rd Street, NW to 25th Street, NW. It is characterized by a consistent grid block structure, radiating avenues, a mix of commercial office and retail uses and a variety of architectural styles. The design of security measures within this zone, must carefully consider the varying uses, business interests, pedestrian circulation, and traffic and parking requirements that exist throughout this employment area to avoid any negative impacts.



# General Security Design Solutions

## Building Security Zones

The "Urban Design Guidelines for Physical Perimeter Entrance Security: An Overlay to the Master Plan for the Federal Triangle," prepared by GSA, presented the concept of security zones. Each of these zones, ranging from the building's interior to the public streets around the building, have different security risks and responses. These can be translated into different architectural, landscape, and streetscape responses to meet these security needs.

GSA's security zones include:

- Zone 1: Building Interior
- Zone 2: Building Perimeter
- Zone 3: Building Yard
- Zone 4: Sidewalk
- Zone 5: Curb or Parking Lane
- Zone 6: Street

Zones 1 and 2 are related exclusively to the architecture of the building, and are not the subject of these guidelines for physical perimeter security. Zone 6 is not subject to these guidelines, except insofar as a decision in the case of Pennsylvania Avenue near the White House must be made – whether to open the street or to keep it closed.

Zones 3, 4, and 5 are related to both the public right-of-way and the surrounding design context of the building. Design guidelines are recommended for these zones.

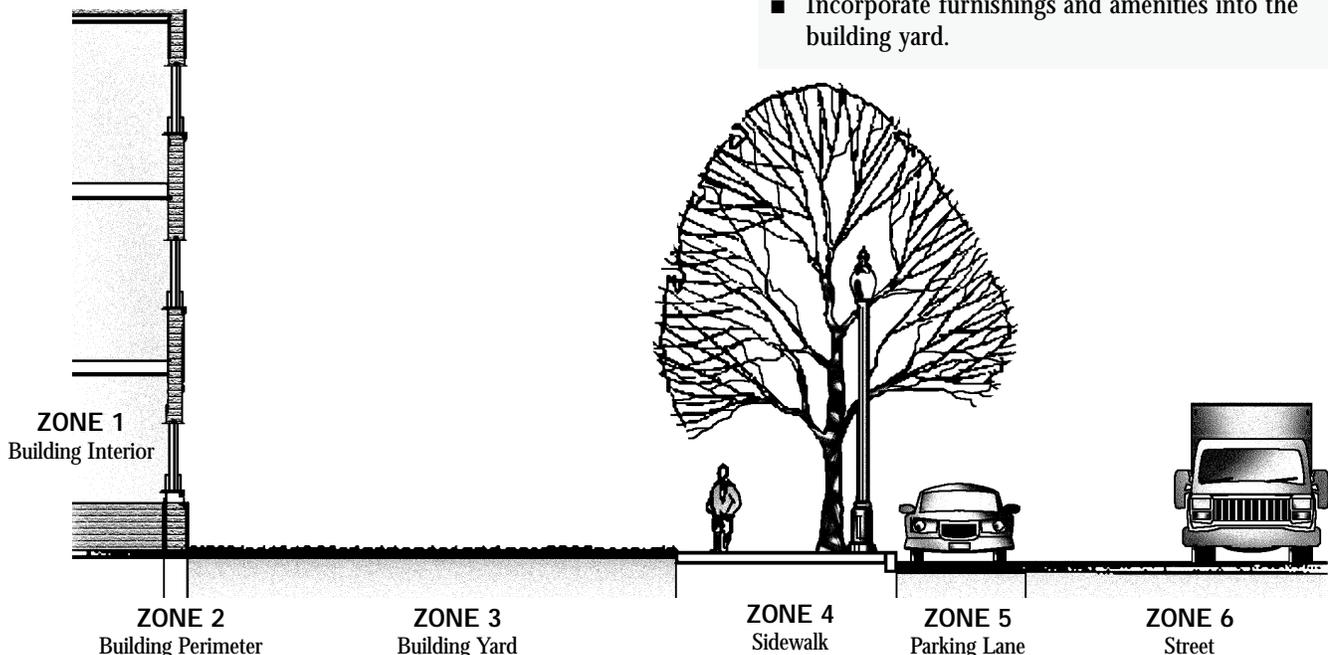
## Zone Prototypes

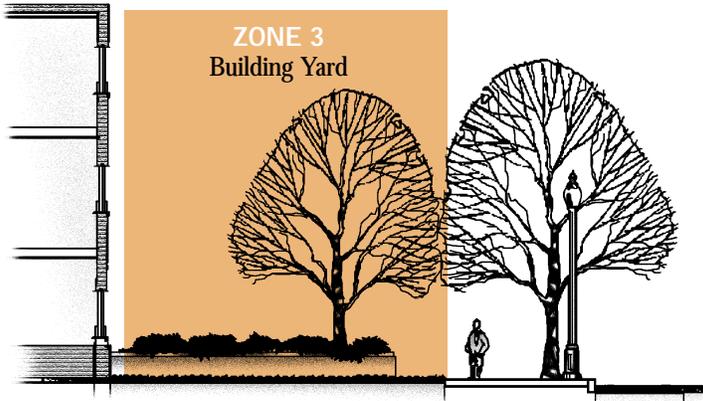
Extending GSA's concept of security zones, the Task Force developed prototypes for the exterior zones of buildings.

### *Building Yard (Zone 3)*

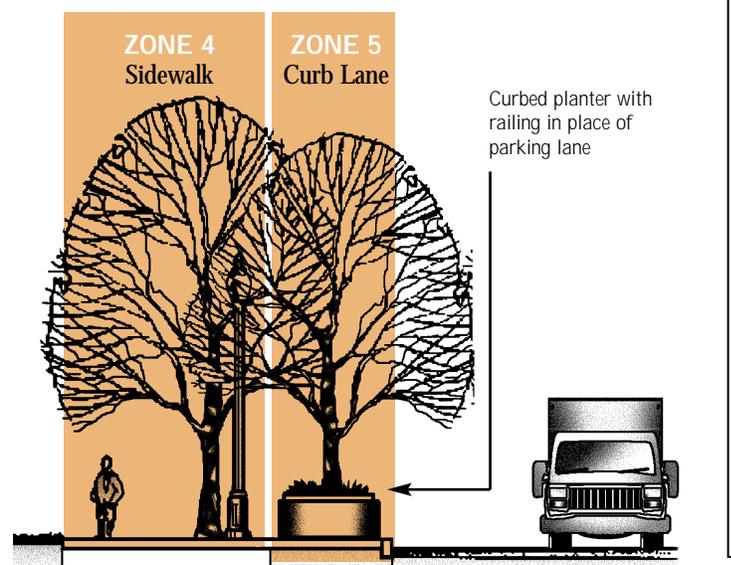
The building yard is that portion of the site located between the building wall or façade and the sidewalk or public right-of-way. The following are recommended guidelines for security measures to be implemented in the building yard security zone:

- Design security measures, such as gatehouses and other entry facilities, to relate primarily to the design of the building.
- Design other security measures to relate to the character of the surrounding area.
- Do not impede pedestrian access to building entries or pedestrian circulation on adjacent sidewalks.
- Use raised planter or building terrace as vehicular barrier, and integrate landscaping and seating.
- Use bollards, light standards, planters, or other furnishings to secure gaps and limit vehicular access through pedestrian access points.
- Plant trees in the yard adjacent to the sidewalk to create a double row of trees flanking the sidewalk.
- Incorporate furnishings and amenities into the building yard.





Raised building plinth or planter with second row of trees can provide building security.



Widened sidewalk incorporating trees, planters, and other streetscape elements. Removed Parking Lane. Curbed planter with railing in place of parking lane

### Sidewalk (Zone 4)

The sidewalk zone is located between the building yard and the curb or parking lane. The following are recommended guidelines for security measures to be implemented in this zone:

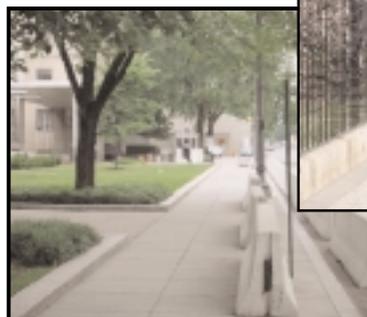
- Design security measures to relate primarily to the character of the adjacent special street or contextual zone.
- Incorporate security design within the design of street lighting, planters, bollards, streetscape amenities (seating, trash receptacles, flagpoles, kiosks, signage, drinking fountains, water features, etc.) and landscaping.
- Do not impede pedestrian access to entries or pedestrian circulation on the sidewalk.
- Integrate planters and bollards into the overall streetscape design.

### Curb Lane (Zone 5)

The curb or parking lane is that portion of the street adjacent to the curb. The following are recommended guidelines for security measures to be implemented in the curb or parking lane security zone:

- Eliminate parking in this lane where warranted by the security risk assessment.
- Eliminate curbside loading zones and service access.
- Incorporate the curbside lane into a widened sidewalk zone.
- Reserve sections of the curb lane for exclusive agency use where such use can be controlled and monitored.

A sidewalk that incorporates security measures should not look like a sidewalk to which security has been added. Instead, security measures should be incorporated into the overall design of the streetscape.



## A Kit of Parts for Urban Design

The Zone Prototypes can guide the development of a kit of parts comprised of a variety of site design and security elements. Designers and planners will be able to select elements from this kit of parts to develop a design appropriate to the conceptual setting and security needs of a specific building or site. A kit of parts may include design elements for:

- Gatehouses
- Terraces, walls, and raised planting beds
- Trees and planters
- Walls and fencing
- Posts and bollards
- Other site furnishings and amenities

Supporting documentation on the kit of parts is available from NCPD.



A gatehouse in President's Park that responds to the urban context and surrounding architecture.



The gatehouse at the Reagan Building is integrated into the site with planter walls that tie to the building.

## Gatehouses

Gatehouses are ancillary structures to buildings that have vehicular access for pick-up, drop-off, service, or parking.

## Walls, Terraces, and Raised Planting Beds

One critical measure of security is stand-off distance. To achieve adequate stand-off distance, the method has been to ring a site or building with jersey barriers. A wall to prevent vehicles from approaching a building can be established at the property line on the building side of the sidewalk, typically in the public right-of-way.

Other stand-off devices include terraces and planting beds. A terrace is a flat or stepped area, usually paved, that typically surrounds a building. A raised planting bed is similar to a terrace, and is generally an extension of the elevation of the first floor of the building into the surrounding site.

Walls, terraces, and raised planting beds should be designed to integrate into the building such that they appear to be an extension of the building itself.

Walls and fences can be simple or ornate and appropriate to their context.



The planter wall at the Department of Interior Annex is low enough that it does not present a visual barrier and high enough to act as a vehicular barrier.



## *Trees and Planters*

Trees and planters can be used to enhance and beautify a site and streetscape and to create a security barrier. Trees can also be used as security elements, assuming the tree is of sufficient size to withstand the impact of the identified vehicle threat. Most of the street trees on Pennsylvania Avenue have matured to the point where they contribute to the security of the federal buildings on the Avenue.

Trees and planters should be designed so they appear permanent and coordinated to form a unified streetscape.

## *Walls and Fencing*

A variety of wall and fencing types can be employed as security elements. Commonly found in streetscapes as a complement to the architecture of adjacent buildings, small knee walls are often located in conjunction with planters and gardens. The design of such walls can vary greatly from solid stone or masonry to open iron or steel designs. They can be simple or ornate. Decorative fencing and ironwork, prevalent throughout Washington's historic districts, can be applied in new contexts and strengthened to meet security requirements.



Fences and walls can be appropriate to their context and enhance the streetscape environment.



Bollards should vary in design and function.



## *Posts and Bollards*

Posts and bollards are the most ubiquitous security elements found in the Nation's Capital as well as in all major cities of the world. They can vary greatly in design and function. Curbside bollards are an effective means of keeping vehicles away from the building walls. They provide ease of pedestrian circulation, meet accessibility requirements, and can significantly enhance the character of the streetscape. The design of bollards, fences, lightposts, and other streetscape and landscape elements should form an urban ensemble that helps create a sense of unity and character appropriate to the Nation's Capital.

## *Site Furnishings and Amenities*

Many other items typically found in the urban streetscape can be "hardened" to act as security measures. Elements such as news kiosks, trashcans, benches, and water fountains can be beautifully designed, well placed, and secure. While they do not look like security devices, they can function as such. Their daily character would disguise their potential protective role. This urban ensemble of streetscape elements, while flexible enough to reflect the distinct character of identified zones, can also provide a component of continuity within the public realm.

Beautifully designed bollards currently exist within the Monumental Core. Those identified in the "Design Guidelines for the White House and President's Park" provide protection and are appropriate to their surroundings.

## *Monumental Core Urban Design and Security Plan*

The Task Force recommends that the National Capital Planning Commission prepare an integrated Urban Design and Security Plan for Washington's Monumental Core within the next six months. The plan will identify permanent security and streetscape improvements and recommend design solutions for Pennsylvania Avenue, President's Park, the Federal Triangle, and the National Mall.

### Urban Design and Security Plan

Building on the current planning and design work prepared for the Task Force, NCPC, along with its partners, will prepare a plan for the design of perimeter security and streetscape improvements for special streets (Pennsylvania, Maryland, Constitution, and Independence Avenues) and contextual zones (President's Park, Capitol Hill, the Mall, Federal Triangle, Southwest Federal Center, and the West End) identified in the Urban Design Framework.

The following outlines the work plan for the Urban Design and Security Plan:

- Prepare and approve a memorandum of understanding for planning, design, and implementation.
- Identify ownership and jurisdictions of special streets and contextual zones.
- Document architectural and urban design features of study areas.
- Complete designs for streetscape/security "kit-of-parts."
- Prepare concept plans for special street and contextual zone study areas:
  - Pennsylvania Avenue and Federal Triangle
  - National Mall/Constitution and Independence Avenues
  - Southwest Federal Center and Maryland Avenue
  - West End and Downtown
- Identify specific improvement projects within each study area.
- Prepare concept design for Phase I priority projects to include:
  1. Pennsylvania Avenue in front of the White House (15th to 17th Streets)
  2. Washington Monument (National Mall)
  3. Pennsylvania Avenue Streetscape (3rd to 15th Streets)
  4. Department of Justice (Federal Triangle)
- Prepare cost estimates and budgets for improvement projects within the Monumental Core.

### Phase I

The Task Force recommends that NCPC, together with one or more nationally recognized urban designers, undertake the planning and concept design of streetscape, landscape, and security for Pennsylvania Avenue and the Monumental Core. Although federal agencies have identified numerous projects in need of physical perimeter security improvements, four have been judged to be high priority, for these projects will set the standard in quality and execution for the design and construction of all subsequent projects. Phase I should be ready to move toward completion with willing agencies and active clients currently investigating designs for streetscape improvements.

## *Pennsylvania Avenue in front of the White House*

This project is described in detail in subsequent sections of this report.

### *Washington Monument*

The Washington Monument is one of the nation's most prominent and visible symbols and one of Washington's most visited attractions. The Monument has also been the site of numerous threatening incidents, and could be the target of a future terrorist attack. Temporary security at the Washington Monument includes a ring of jersey barriers and a temporary visitors screening facility that is attached to the monument entrance.

One possible security design approach is to locate the perimeter at the minimum stand-off distance, approximately 200 feet, from the base of the monument. This would place the perimeter within the open lawn area of the Mall and would result in a ring of security approximately 1,300 linear feet in length. The security barrier could be established with a ring of bollards co-located with a circular walkway surrounding the monument. Furnishing the walkway with benches and other amenities typically associated with pedestrian circulation could result in an attractive and functional addition to the Mall.

Temporary security at the Washington Monument includes a ring of jersey barriers for required stand-off distance and a temporary visitor screening facility that is attached to the monument entrance.

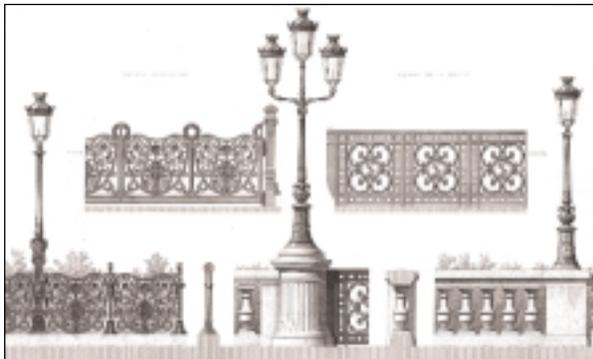
Another approach is to establish a security barrier at the perimeter of the site, along 15th Street, Constitution Avenue, 17th Street, and Independence Avenue. Such a barrier would be less visible from the monument, but it could result in a greater overall impact and visibility due to its length. This solution could employ the use of the President's Park bollard in a manner similar to its use in Lafayette Park – mounted on a low granite curb and retained by a very deep and robust structural foundation for impact resistance.



## *Pennsylvania Avenue Between 3rd and 15th Streets*

Security needs and pedestrian conditions along the length of Pennsylvania Avenue from the Capitol to the White House vary greatly. While some locations require maximum security, others require none; while some buildings are set back with wide sidewalks, others are not. The key to a redesign or updating of the Pennsylvania Avenue streetscape is to provide consistency within this variation while building upon the previous Pennsylvania Avenue Development Plan. A thorough inventory of existing streetscape elements will facilitate the creation of a plan that is able to improve upon this previous effort. All elements in place will be assessed for their application to security needs and, where possible, incorporated into the new streetscape design.

Bollards, posts, site furnishings, and amenities should predominate on this special street as differentiated from the expansive planter beds or raised planting beds employed on the north-south streets. Security elements and streetscape improvements should be coordinated along the length of the Avenue and varied accordingly to provide a consistent and graceful appearance, regardless of changing security needs. Here, the creation of an appropriate and dignified public realm is paramount.



Security measures and streetscape elements along Pennsylvania Avenue are proposed to be composed of the most formal elements from the contextual kit of parts.

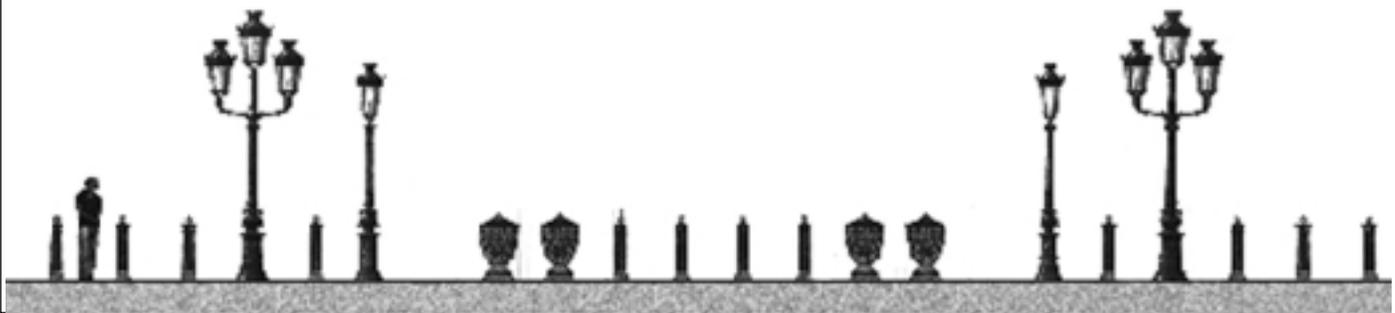
## *Federal Triangle*

Representatives from the Department of Justice have expressed a desire that their facility be included as a Phase I project. The design of plans for the Department of Justice Building, a Federal Triangle Project, are substantially advanced. Both the Department of Justice and Pennsylvania Avenue (3rd to 15th Streets) projects would share design prototypes and application of the kit of parts identified earlier in this report.

Streetscape elements deployed in the Federal Triangle should respond both to the existing strong architectural character and the successful design plans that have guided development within this zone. Site furnishings and security elements should be designed to respond to the predominant neoclassical style of this area.



Pennsylvania Avenue in front of the White House is closed to all but security and emergency vehicles.



# PENNSYLVANIA AVENUE AND THE WHITE HOUSE—A CASE STUDY

The Urban Design and Security Plan proposed by the Task Force is a comprehensive design program for security measures throughout Washington's Monumental Core; Pennsylvania Avenue in front of the White House is one part of that larger plan. However, because this precinct is arguably the most historic and symbolically sensitive in the country, and because its closure has had wide-ranging effects, the Task Force examined the future use of the Avenue in considerable detail. In its examination, the Task Force studied the current and future security needs of the White House and the impacts of the closure on the symbolism and historic resources of Pennsylvania Avenue. It reviewed past proposals for either reopening or permanently closing the street, and it carefully evaluated a number of traffic alternatives along Pennsylvania Avenue. Finally, the Task Force evaluated options for a new design for President's Park.

## *The Closing of Pennsylvania Avenue*

On September 12, 1994 a single engine private airplane crossed the South Lawn of the White House and crashed into the south side of the executive mansion. Following this and other incidents, the Department of the Treasury initiated the White House Security Review to conduct a comprehensive review of the security measures at the White House complex.

The May 1995 "Public Report of the White House Security Review" states, "After careful consideration of the information, the Review is not able to identify any alternative to prohibiting vehicular traffic on Pennsylvania Avenue that would ensure the protection of the President and others in the White House complex from explosive devices carried by vehicles near the perimeter." On May 19, 1995, the Secretary of the Treasury issued an Order to the Director of the Secret Service to implement the recommendations of the Security Review and, on May 20, 1995, the Director of the Secret Service, pursuant to the Order, closed Pennsylvania Avenue in front of the White House to vehicular traffic.

The primary security objective was to establish appropriate security measures for the protection of the President and the White House complex, addressing reasonable threat scenarios within the context of an acceptable level of risk. It is widely understood that it is not possible to protect the President or the White House from all possible threats.

Temporary security measures first implemented on Pennsylvania Avenue in front of the White House shut down the Avenue to vehicular traffic by blocking Pennsylvania Avenue at 15th and 17th streets with trucks and other vehicles. Once closed, subsequent temporary measures, consisting of guardhouses, operable delta barriers, and precast concrete planters in a wide variety of sizes, colors, styles, and landscaping, were implemented and are increasingly permanent in appearance.

These interim security measures ensure the required stand-off distance from the White House and establish checkpoints for controlling access for authorized vehicles onto Pennsylvania Avenue in front of the White House. A positive consequence of these actions is the creation of a safe and convenient pedestrian zone for the large numbers of tourists that gather and view the north side of the White House.

Since 1995, the Secret Service and other law enforcement agencies have continued research and analysis to identify possible solutions to the security requirements but, to date, they have found no alternative to the street closing.

Temporary guardhouses, delta barriers, and concrete planters on Pennsylvania Avenue in front of the White House.





L'Enfant's placement of the White House and grounds at the juncture of New York and Pennsylvania Avenues.

## Impacts on Historic Resources

President's Park has evolved from L'Enfant's placement of the White House and grounds at the juncture of New York and Pennsylvania Avenues and at the opposite end of Pennsylvania Avenue from the U.S. Capitol. Thomas Jefferson allowed some of the land, now known as Lafayette Park, to be used by the public for its enjoyment, and a public way was created in front of the White House. The symbolic significance of the open, radiating streets projecting from the front door of the White House is discernible today. The relationship of the White House and its grounds to the city plan for the capital continues to hold symbolic and functional significance. The public use of Pennsylvania Avenue and E Street through President's Park has contributed to its identity as a public place. These streets connect the White House to the city at large.

Proposals for changes within President's Park must carefully consider the symbolic setting of the White House within its precinct and within the city. The Guiding Principles of the Comprehensive Design Plan for The White House and President's Park are the guidelines for assessing change within this precinct. The setting of the White House and its related buildings must be retained as an understandable, cohesive ensemble.

## Impacts on Traffic

Traffic movements in the city of Washington are accommodated on the street system that was designed by Pierre L'Enfant in 1791. It is a grid system with the addition of diagonal avenues.

Early White House facing a public way.



Grid systems allow traffic to move around the city along multiple combinations of north-south and east-west streets, and drivers tend to choose routes that provide the least amount of delay. When a segment of the roadway grid system is removed, drivers will select alternate routes that reduce their delay. When Pennsylvania Avenue was closed to through traffic, 13 bus lines were rerouted and 25,000-30,000 vehicles were forced onto adjacent streets, prompting the District of Columbia to quickly implement system modifications that would better accommodate the traffic demand. This included converting H and I Streets to one-way streets, thereby increasing their capacity.

In light of very limited traffic data for the pre-closure roadway system, there has been much debate concerning the impacts on traffic movement that resulted from the closure of Pennsylvania Avenue. The Task Force understood that, while it was impossible to accurately measure the impact of the Avenue's closure on previous traffic operations, it was possible to evaluate the anticipated impacts of infrastructure improvements designed to ease current traffic congestion in this part of the city. The Task Force studied several potential design alternatives with the goal of improving the movement of traffic in the vicinity of the White House and reconnecting the areas east and west of President's Park. The study alternatives included Transportation System Management (TSM) strategies as well as improvements to provide additional east-west capacity, predominantly by the use of tunnels along the Pennsylvania Avenue and E Street alignments.

## Impacts on the Downtown Economy

Within the past five years, the District of Columbia, through a coordinated effort, has made tremendous strides in transforming its downtown into a lively center for business, residences, arts, entertainment, and retail. In addition to the new MCI Center, downtown Washington has been witnessing the development of a new convention center, new office and residential buildings, and innovative mixed-used projects.

The closure of Pennsylvania Avenue placed a strain on downtown businesses. Based on projections by the District's Department of Public Works, if the pace of development continues at its current rate, the total volume of traffic downtown will be increasing 2 percent per year, and therefore could create additional hardship. Those who live in, work in, or visit Washington depend upon the central thoroughfares that carry them from one part of the city to the next. If getting around becomes too burdensome, then living in, working in, or visiting the city may become less palatable to a growing number of people, hindering recent efforts to revitalize Downtown DC.

## Prior Proposals for Pennsylvania Avenue

After examining the impacts of the Pennsylvania Avenue closure, the Task Force considered proposals that had already been made for the future of Pennsylvania Avenue. These included John Carl Warnecke's 1963 plan, the Interagency Plan of 1996, the recent Federal City Council Plan, a plan by Washington Architect Arthur Cotton Moore, and a plan prepared by the firm of Franck Lohsen & McCrery. Further information on each of the plans is appended to this report. The Task Force's assessment of these proposals took into account each proposal's response to security, symbolism, vehicular and pedestrian circulation, cultural resources, historic preservation, urban design, and the environment.

The Task Force found that none of the past plans to reopen Pennsylvania Avenue were determined adequate in meeting the security requirements associated with the White House complex. Likewise, all plans were considered to be adverse to the historic character and setting of the White House.

## Threat and Security Measures Studied

As part of its examination of the threat to the President and the White House, the Task Force received several special security briefings. The Task Force determined that federal law enforcement and intelligence agencies' assessment of the threat had not changed since the 1995 street closing, and that recent terrorist attacks on the World Trade Center and the Pentagon have heightened that level of threat. In its study, it was apparent to the Task Force that it is not possible to identify and deter all potential threats to the White House, but that a vehicle bomb posed the threat of catastrophic damage to the Complex. Further, the Task Force found that existing countermeasures, other than stand-off distance, are not currently available to mitigate the blast effects of a vehicle bomb attack against the White House Complex.

It is therefore necessary to establish a physical security perimeter to provide the necessary stand-off distances.

The Task Force's work included a review of standard security measures including stand-off distances, vehicular barriers, blast walls, building hardening, and exploration of the latest technologies. Federal law enforcement, military, and independent researchers have conducted tests, which have determined that a stand-off distance is necessary to provide a reasonable blast effect mitigation zone around the White House. On the north side of the White House, this distance extends to the north side of Lafayette Park near H Street; on the south, this distance is approximately that of the

existing E Street perimeter of the South Grounds. Although some consider the existing stand-off distance to be excessive, practical experience indicates differently. The Oklahoma City bombing resulted not only in the catastrophic collapse of the Murrah Federal Building, but also caused extensive structural damage to many other buildings 1,000 feet away.

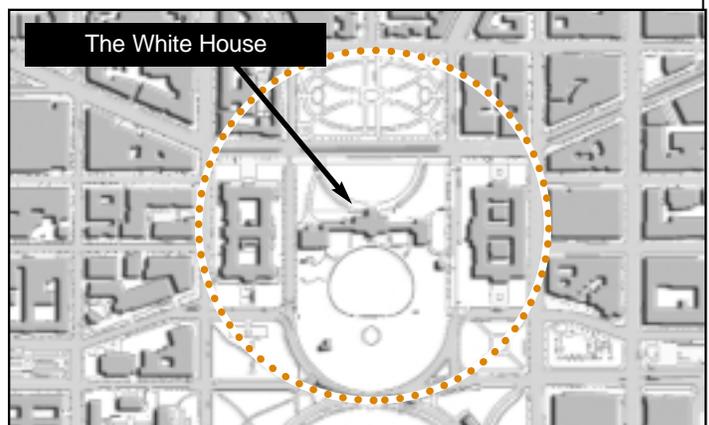
On Pennsylvania Avenue, vehicular barriers are used to prevent an explosive laden vehicle from violating the stand-off security zone perimeter. Security barriers consist of fixed elements, such as a wall or bollards, and flexible elements in conjunction with security check points to clear authorized vehicles.

After reviewing all of the proposals that would allow the Avenue to be reopened to unrestricted public vehicular traffic, the Task Force could identify no currently available technologies, including blast walls, remote detection sensors, or other blast countermeasures, other than sufficient stand-off distance, that could provide a practical means of protecting the White House from a catastrophic vehicular bomb attack. Blast walls are designed to reflect the pressure of a blast wave, which radiates out from the blast and is then reflected off surrounding structures. In order for a blast wall to be effective, it has to be no farther from the target than the height of the wall. If not, the blast wave will reform between the wall and target. At the White House, the blast wall would need to be located approximately fifty feet in front of the north wall and be fifty feet in height.

The hardening of any target is viewed as the last line of defense. The White House could be difficult to harden due to its basic structural features and historic significance. Effective hardening of the White House may require major reconstruction and temporary displacement of the First Family and the White House staff, and would entail significant operational issues.

The Task Force concluded that maintaining an effective stand-off distance is the only currently workable measure to provide an effective security environment for the White House.

Dotted circle represents stand-off distance zone.



## Traffic Alternatives Studied

The Security Task Force identified several traffic and circulation options that have the potential to restore some of the transportation capacity lost with the closing of Pennsylvania Avenue in front of the White House. These options included the possibility of constructing a tunnel within either the Pennsylvania Avenue or E Street corridors. For each of these options, state-of-the-practice traffic simulation software was used to evaluate their relative capabilities to handle the existing levels of traffic demand. The results of this evaluation are included in a detailed report titled "Pennsylvania Avenue Traffic Alternatives Analysis." Following is a summary of the alternatives included in this study.

### No Build (Pennsylvania Avenue remains closed)

This option retains the existing closed condition on Pennsylvania Avenue between 15th Street and 17th Street and serves as a baseline to measure the relative benefits of each of the traffic alternatives.

### Pennsylvania Avenue remains closed with Transportation System Management (TSM) Improvements Implemented

This option considers the impact of several TSM improvements in the study area, but does not reopen Pennsylvania Avenue to ordinary through traffic. The TSM improvements include retiming and improved synchronization of the traffic signals, improved parking management (including both enforcement and parking restrictions), and intersection improvements. These actions could be implemented in a very short time period and have proven, historically, to be very cost-effective in improving traffic flow.

The Task Force study indicates that the implementation of appropriate TSM strategies would result in a significant improvement to traffic flow as measured by total vehicle delay. Delay is estimated to be reduced by approximately 20 percent in the morning peak hour and 12 percent in the afternoon peak hour. These projected improvements are similar to the benefits measured by other cities as a result of their implementation of TSM strategies.

### Pennsylvania Avenue is reopened (including TSM improvements)

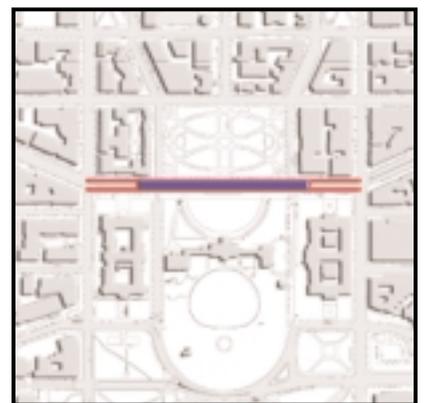
This option considers reopening the Avenue between 15th Street and 17th Street at-grade to vehicular traffic on a four-lane roadway (two lanes in each direction). In combination with appropriate TSM strategies, this option is estimated to reduce total vehicle delay in the study area by approximately 22 percent in the morning peak hour and 20 percent in the afternoon peak hour.

### Short Tunnel Alternative (including TSM improvements)

This option includes a tunnel under Pennsylvania Avenue with the west portal between 17th Street and Jackson Place and the east portal between Madison Place and 15th Street. This tunnel would be approximately 870 feet long and would incorporate the maximum acceptable entrance and exit grades. Ventilation for a tunnel of this length could be accommodated without above-grade ventilation structures. Construction is expected to last approximately two years and, in that the street is already closed, there would be no impacts to existing traffic movements.

The traffic handling capability of this option is similar to reopening the street at-grade. In combination with appropriate TSM strategies, this option is estimated to reduce total vehicle delay in the study area by approximately 21 percent in the morning peak hour and 21 percent in the afternoon peak hour.

Short Tunnel with portals within President's Park (15th to 17th Streets)



## Intermediate Tunnel Alternative (including TSM improvements)

This option considers a tunnel under Pennsylvania Avenue with the west portal between 17th and 18th Streets and the east portal between 15th Street and Madison Place. This tunnel would be approximately 1,470 feet long and would require above-grade ventilation structures. Construction is expected to last two and a half to three years, with associated traffic impacts related to construction across 17th Street and along Pennsylvania Avenue for the portal construction.

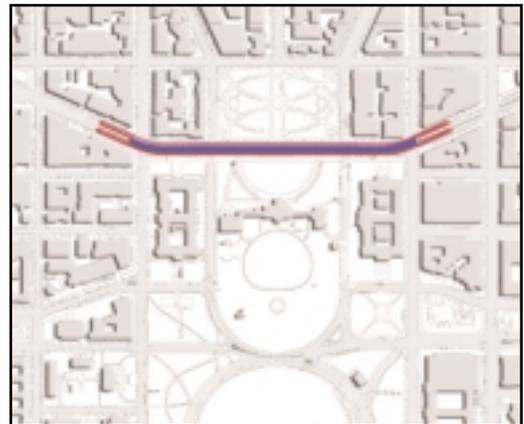
While this option would remove the traffic conflict at the intersection of 17th Street and Pennsylvania Avenue, the improvements to traffic flow within the study area is expected to be similar to the other Pennsylvania Avenue tunnel options. In combination with appropriate TSM strategies, this option would reduce total vehicle delay in the study area by approximately 23 percent in the morning peak hour and 21 percent in the afternoon peak hour.

## Long Tunnel Alternative (including TSM improvements)

This option locates the west portal between 17th Street and 18th Streets and the east portal on New York Avenue between 14th and 15th Streets. This tunnel would be approximately 1,860 feet long and would require above-grade ventilation structures. Construction of this alternative is expected to last more than three years with associated traffic impacts related to construction across 17th Street and along Pennsylvania Avenue for the western portal construction, and across 15th Street and along New York Avenue for the eastern portal construction.

While this option would remove the traffic conflict at the intersections of 15th and 17th Streets with Pennsylvania Avenue, the improvements to traffic flow within the study area, as measured by total vehicle delay, would be similar to the other Pennsylvania Avenue tunnel options. In combination with appropriate TSM strategies, this option is estimated to reduce total vehicle delay in the study area by approximately 21 percent in the morning peak hour and 22 percent in the afternoon peak hour.

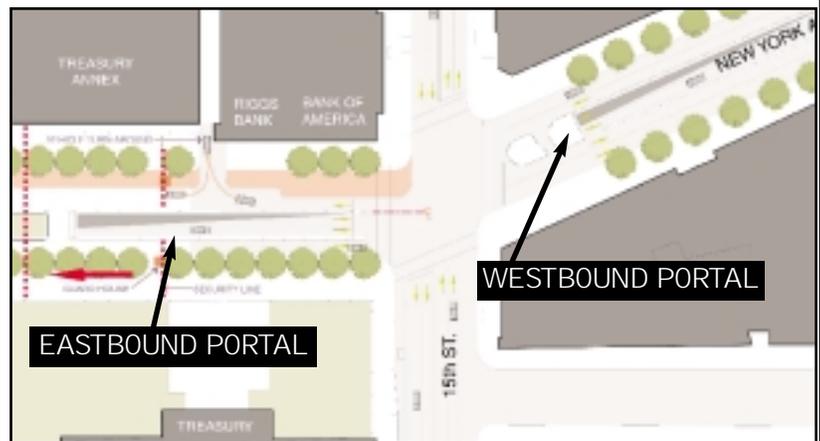
Long tunnel alternative with portals outside of President's Park (15th and 17th Streets)



## Split-Portal Tunnel Alternative (including TSM improvements)

This option combines features of the intermediate and long tunnels. The west portal is located between 17th Street and 18th Street, while on the east end, the eastbound portal is located at the intersection of 15th Street, and the westbound portal is located at the intersection of 14th Street. This tunnel would be approximately 1,860 feet long and would require above-grade ventilation structures. The time required for construction would be approximately three years with associated traffic impacts related to construction across 17th Street and along Pennsylvania Avenue for the western portal construction, and across 15th Street and along New York Avenue for the eastern portal construction. It is expected that utility relocations for this option would be less complicated than the long tunnel option.

While this option would provide some safety and turning movement benefits compared to the long tunnel option, improvements to traffic flow within the study area would be similar to the other Pennsylvania Avenue tunnel options. In combination with appropriate TSM strategies, this option would reduce total vehicle delay in the study area by approximately 24 percent in the morning peak hour and 22 percent in the afternoon peak hour.



Split tunnel alternative

## E Street Tunnel and Pennsylvania Avenue reopened (including TSM improvements)

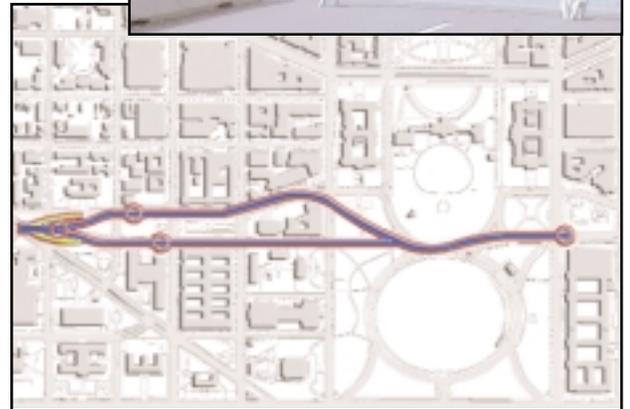
This option considers the E street tunnel in combination with reopening Pennsylvania Avenue at-grade. It would provide the most additional east-west capacity, and a free-flowing movement along E Street. As such, the benefits to traffic flow are the greatest. In combination with appropriate TSM strategies, this option is estimated to reduce total vehicle delay in the study area by approximately 24 percent in the morning peak hour and 34 percent in the afternoon peak hour.

## E Street Tunnel/No Build (including TSM improvements)

This option includes a tunnel south of the White House (approximately under E Street) with the east portal on E Street between 14th and 15th Streets and the west portal connecting to the E Street Expressway, west of 20th Street. This option would provide a direct connection from Pennsylvania Avenue east of 15th Street to both Georgetown and Virginia, via the Theodore Roosevelt Bridge. This option would provide relief to Constitution Avenue and could measurably alter traffic patterns beyond the evaluated study area. The tunnel would be approximately 3,000 feet long, requiring several above-grade ventilation structures. Construction of this alternative is expected to last three years to four years with associated traffic impacts related to construction along the E Street corridor.

While this option would provide relief to different traffic movements, as compared to the Pennsylvania Avenue tunnel options, the improvements to traffic flow within the study area, as measured by total vehicle delay, would be similar to the Pennsylvania Avenue tunnel options. In combination with appropriate TSM strategies, this option is estimated to reduce total vehicle delay in the study area by approximately 22 percent in the morning peak hour and 23 percent in the afternoon peak hour.

Closed E Street at West Executive Avenue



One of several E Street tunnel alternatives by FHWA

## *Assessment of Traffic Alternatives*

The traffic analysis evaluated the relative ability of each of the traffic and circulation options to handle existing traffic demand in the identified study area for the morning and afternoon peak hours. In the short term, the Task Force concludes that traffic congestion can be significantly improved through a variety of transportation system management (TSM) initiatives, such as traffic signal synchronization, intersection improvements, and more active enforcement of parking regulations. This conclusion is consistent with the findings of similar projects across the country. These measures are also relatively inexpensive and could be implemented in a matter of months.

This study found that the congestion levels in the morning peak hour could be substantially relieved (an approximate 20 percent improvement) through implementation of TSM strategies. For this reason, and the fact that the north-south traffic is substantially higher than the east-west traffic, neither reopening Pennsylvania Avenue nor implementing the tunnel options, which add additional east-west capacity, would measurably reduce total vehicle delay within the study area. During the afternoon peak hour, when congestion is measurably higher,



implementation of the TSM strategies had somewhat less of an impact on reducing total vehicle delay (an approximate 12 percent improvement). In the afternoon peak hour, the inclusion of additional east-west capacity, as provided by the various tunnel options, is estimated to further improve traffic flow and reduce vehicle delay by an additional 9 percent.

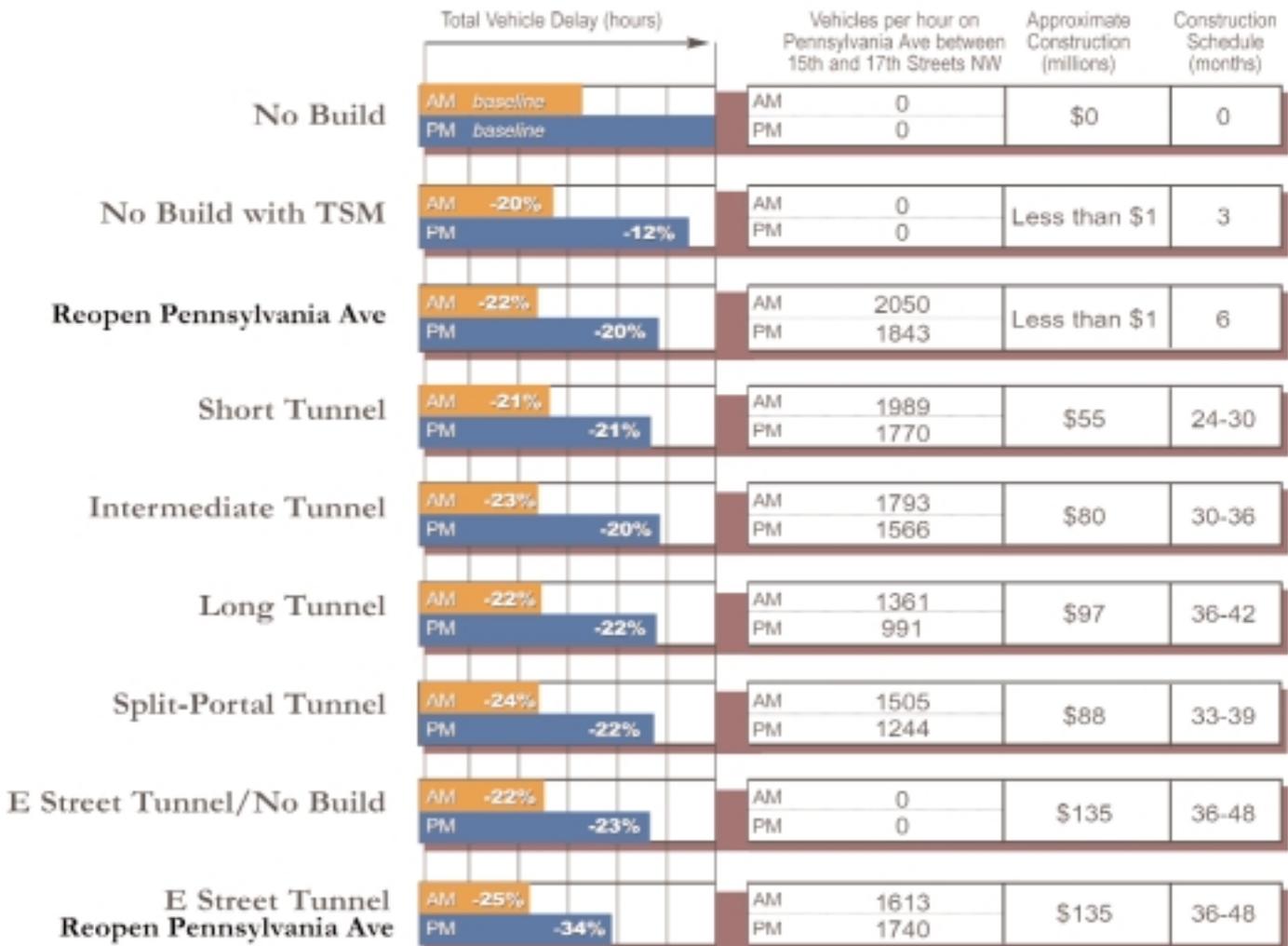
Each of the tunnel alternatives studied resulted in similar levels of improvements to traffic flow within the study area. While each alternative had advantages or disadvantages associated with individual traffic movements, the overall reduction in total vehicle delay was found to be similar.

While transportation systems are typically designed to accommodate morning and afternoon peak demands, in some instances, evaluation of midday demands can be important. While midday traffic volumes are estimated to be about one-third lower than the rush hour volumes, movements can be complicated by the fact that many

parking restrictions are not in place, truck deliveries tend to be more frequent, and traffic patterns are more random. In some instances, mid-day traffic needs may not be adequately satisfied through solutions designed specifically for the morning and afternoon rush hours.

The Task Force finds that replacement of lost east-west transportation capacity will be required to support the city's continued growth and vitality on a long-term basis. In order to address this need, the Task Force recommends serious consideration of a tunnel within the Pennsylvania Avenue or the E Street corridors, combined with a Circulator and wider application of TSM measures. This recommendation will require detailed traffic studies (including TSM impacts), engineering, environmental, historic preservation, urban planning and cost benefit analyses in order to conclude the decision-making process. These studies should be undertaken immediately and concluded within 18 to 24 months.

### Comparative Effectiveness of Potential Traffic Improvements



## Decision Making for Pennsylvania Avenue

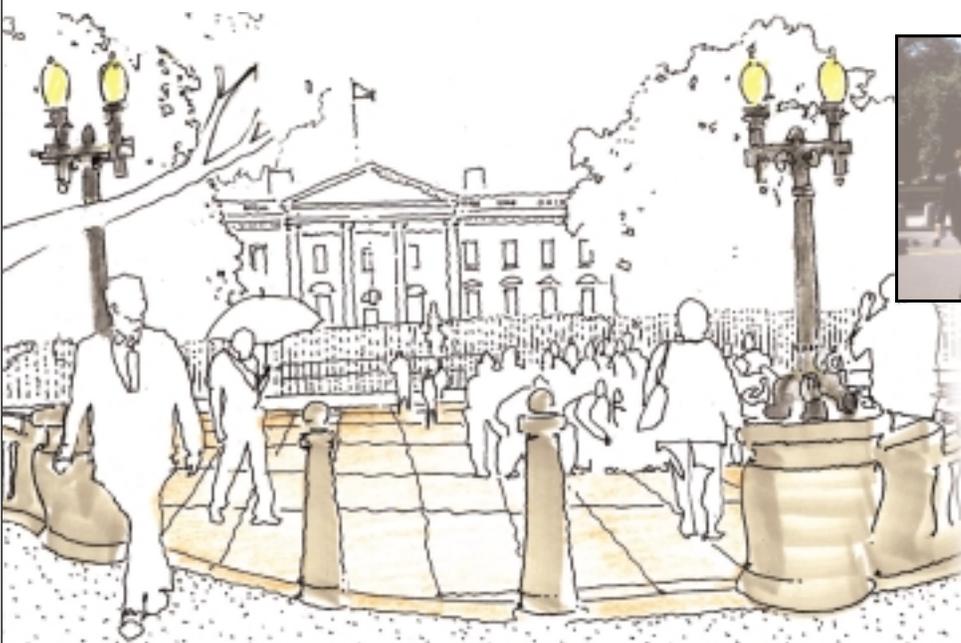
The Task Force sought to get beyond the somewhat artificial dichotomy between security versus traffic that has long dominated debate on the closing of Pennsylvania Avenue in front of the White House. Security as the dominant variable has resulted in the present unacceptable circumstance of a public corridor made far less public or approachable. The symbolism of gates and checkpoints is hardly congruent with our traditional pride in being an open, barrier-free society. So long as security and traffic optimization are each held as an absolute value and assumed to be antithetical to the other, no wise consensus about the future of Pennsylvania Avenue can emerge.

In reaching its conclusions about the future use of Pennsylvania Avenue, the Task Force gave careful consideration to security imperatives and traffic implications for the District, but also to heritage and preservation criteria, urban design and streetscape considerations, and financial resources. The Task Force also focused on the less precise but more meaningful criteria of 'quality of place.' It began to view security, which initially led to the closing of Pennsylvania Avenue, as a catalyst for the creation of a more pleasant, a more hospitable, more graceful, and more beautiful stretch of Pennsylvania Avenue. The Task Force determined that there was an opportunity, through the beautification of Pennsylvania Avenue, to achieve the necessary level of safety for the White House as well as actual improvements to traffic management.

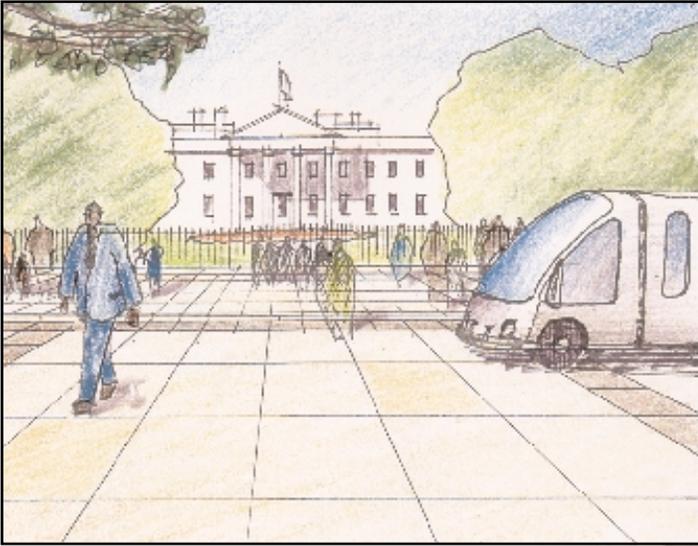
The Task Force noted Americans, and the world at large, have come to associate the Nation's Capital with qualities such as openness and grace, public access, and an absence of fear. Secure in the knowledge that the civic environment belongs to all, the public feels entitled to move about it freely. Such confidence is precious and worth holding onto, especially during an era that calls for heightened security. The Task Force concluded, however, that this freedom to occupy and to move about the capital does not depend upon maintaining a daily flow of 25,000 plus vehicles along Pennsylvania Avenue in front of the White House.

Task Force members agreed that while lively streets are a frequent measure of the vitality of their cities, they do not have to be major traffic arteries. A stretch of Pennsylvania Avenue closed to vehicles, but made into a welcoming, beautiful, pedestrian realm, is likely to become a superior public environment, one whose democratic aura of openness and accessibility is undiminished. It is the present condition of the street, crudely barricaded for security without other modification that offends and sends messages of insecurity. The Task Force concluded that to approach, stroll by, or sit and contemplate the magisterial presence of the White House; to inhabit President's Park without impediments—including cars—speaks to the symbols of freedom and openness.

In light of the very real security threats that reopening Pennsylvania Avenue to traffic poses to the White House, and with the firm belief that the setting of President's Park can be greatly enhanced through redesign, the Task Force concluded that the preferred option for the present time is that Pennsylvania Avenue remain closed to normal city traffic. If in the future, there are major positive changes in the security environment and/or risk detection technology is improved, this recommendation should be reconsidered by the Task Force.



There exists an opportunity to create a civic plaza in front of the White House that is appropriate to this prominent location



A future transit Circulator could be accommodated without taking away from the generally pedestrian character of the Avenue.

The redesigned space in front of the White House would reflect a clear memory of the avenue.



## *President's Park Promenade and Park Plan Concepts*

Maintaining Pennsylvania Avenue free of through traffic, at least for the foreseeable future, opens up a variety of design opportunities to expand upon the distinguished, pedestrian-oriented, public environments so characteristic of our Capital. Such an outcome is superior to the present condition of a street crudely barricaded by security checkpoints. And, from a pedestrian perspective, it may well be superior to the pre-1995 condition of a six-lane wide thoroughfare in which pedestrians maneuvered around a steady flow of automobile, bus, and truck traffic. The qualities to be evident in an enhanced public realm along Pennsylvania Avenue should be:

*A setting that is welcoming and better scaled for pedestrian movement and visitor enjoyment of the overall environs of President's Park.*

*A setting in which landscape elements characterize the visitor's experience—a landscape congruent with the nearby grace of Lafayette Park and the White House grounds themselves.*

*A setting in which vistas and views along the axis of Pennsylvania Avenue and towards the White House would be reinforced by tree-planting and similar landscape devices.*

*A setting in which strolling—promenade-like—along the Avenue becomes an enjoyable and memorable experience.*

*A setting in which the historic integrity of a street is maintained while changes in its use are acknowledged.*

*A setting in which the Inaugural Parade can follow its traditional route in front of the White House.*

*A setting in which a future transit Circulator can be accommodated without taking away from the generally pedestrian character of the Avenue.*

*A setting in which gatherings of school children or tourist groups at the gates to the White House would be naturally and generously accommodated rather than awkwardly constrained by a traffic artery.*

*A setting in which a host of pedestrian amenities, including handsome and well-designed lighting, paving, seating, and similar streetscape components would contribute to the overall ambiance of President's Park.*

*A setting in which security for the White House is achieved without the physical components of security systems that visually dominate the experience of the environment.*

It is possible to conceive several designs for Pennsylvania Avenue that would accommodate such characteristics. One concept might reinforce the historically linear nature of the Avenue with few added features—emphasizing a new “President’s Walk” between 15th and 17th Streets. Another concept might take advantage of the wide curb-to-curb right-of-way to plant an additional row or two of street trees, making the Avenue more boulevard-like. The tradition of reinforcing the Capital’s streets with tree planting dates back to Thomas Jefferson, who authorized the planting of Poplars along several major avenues. Yet another concept might emphasize greater continuity of planting and design features with Lafayette Park, creating a more park-like atmosphere along the Avenue.

Each of these conceptual directions is worthy of additional detailed exploration and public comment during a process leading to a final design. Each, however, must be evaluated against the qualities of place described above.

The Task Force recommends the immediate design and construction of a landscaped, civic space along the Pennsylvania Avenue right-of-way in front of the White House that respects and enhances the historic setting and views of the White House. The street would be maintained in a redesign that reflects a clear memory of its historic use and would not preclude reopening the street, staging inaugural parades, or possible construction of a tunnel.

A tunnel portal appropriate to its context. (Paris)



## Tunnel Portal Design Options

The Task Force is aware that in any design alternative to President’s Park and the surrounding area that includes a tunnel, extraordinary care must be given to the location and design of the tunnel portals. Tunnels are commonplace in many cities. They exist both for traffic and pedestrians, under busy intersections and spacious parks. In the District, they stretch beneath the Mall, and below Dupont, Thomas, and Washington Circles, allowing efficient movement of traffic through the city and preserving vehicle-free open spaces. These advantages are, however, often offset by disadvantages associated with their portals. Long ramps can disrupt the urban setting and views and prohibit mid-block street crossings.

The Task Force determined that a covered tunnel can be designed to meet security requirements under Pennsylvania Avenue in front of the White House. The tunnel would be strengthened to withstand any blast that might occur within that portion of the tunnel located within the required stand-off distance from the White House. In addition, if an explosion were to detonate in the tunnel, the blast effects, including ground shock, would likely result in damage to foundations and utility infrastructure. Venting would also occur at the two ends of the tunnel. There are blast mitigation strategies to address these issues and they will require further study.



Architectural elements of the portals would be designed to ensure visual compatibility with the historic character of President’s Park.



The dimensions of the portals for the Pennsylvania Avenue tunnel options were established by the requirements of a 7 percent roadway vehicular slope and the need to accommodate four lanes of traffic. The four-lane portal width of 50 feet is used for study purposes in all options except for the staggered tunnel option, which splits the wide portal into two narrower portals, each accommodating two lanes of traffic and reducing the portal widths to 25 feet.

Within President's Park the 90-foot curb to curb avenue can accommodate tunnel portals as well as needed surface circulation and parking lanes. West of 17th Street, Pennsylvania Avenue remains wide enough to comfortably accommodate a tunnel portal without loss of sidewalk or parking lanes. East of 15th Street, however, the limited width of New York Avenue would require the loss of parking and a narrowing of the sidewalks to accommodate a four-lane tunnel portal. A narrower portal would be less intrusive within President's Park and New York Avenue.

The Task Force carefully reviewed the location of the tunnel portals and their impacts on surrounding buildings. Closest to the White House, the successful combination of benches, planting beds, and railings would mitigate the presence of the portal edges, rendering the tunnel all but invisible from the park north of the White House. The short and intermediate tunnels directly impact the Renwick Gallery and Blair House to the west, and the Treasury Building to the east. The long tunnel would eliminate the impact on President's Park, but it would have a more adverse impact on New York Avenue than the staggered tunnel option – an option that also lessens the impact of the 15th Street portals on the immediate environment.

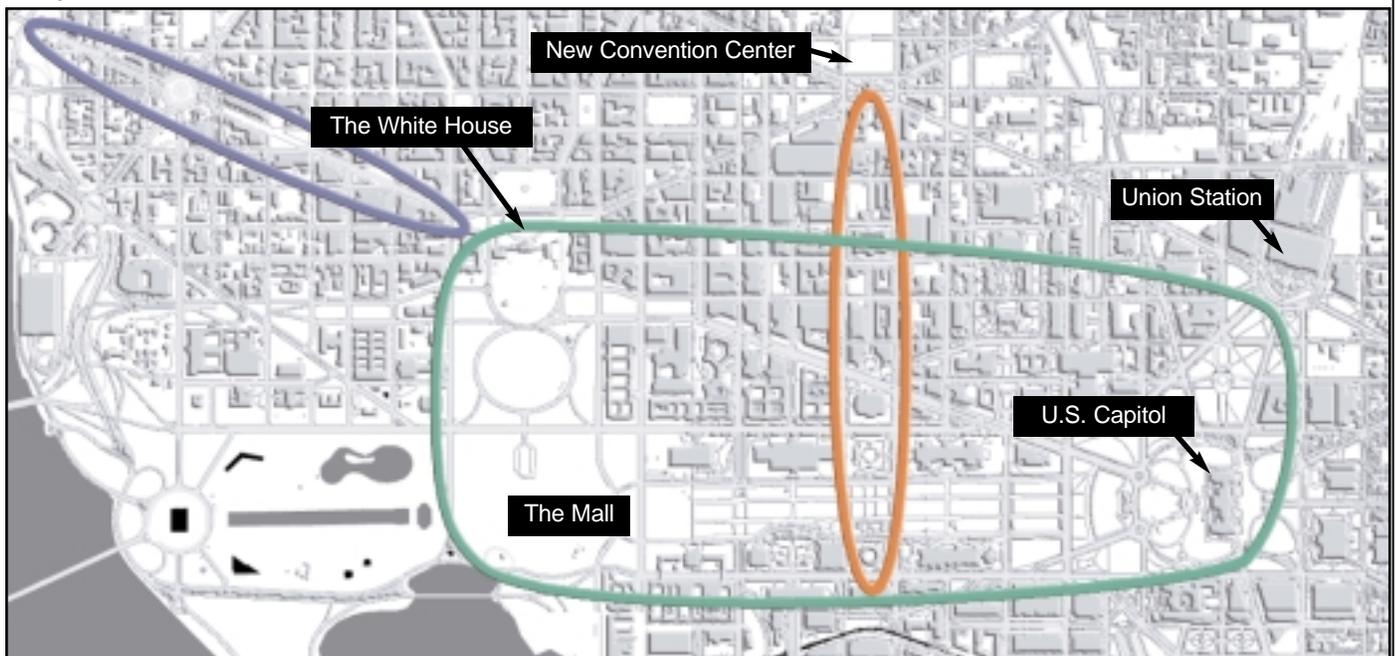
One of the Circulator routes should provide service along Pennsylvania Avenue in front of the White House.

While the tunnel options do pose certain problems, the advantage of minimizing large areas of pavement in front of the White House should not be overlooked. At the portal, paving materials could be extended from the sidewalks to the edge of the portal opening. With limited vehicular access in this area, such paving could greatly increase and improve the pedestrian realm of President's Park.

All architectural elements of the portals need to be visually compatible with the historic character of President's Park. The streetscape elements surrounding the Old Executive Office Building and the Treasury Building can incorporate the bollards, railings, and benches identified in the Design Guidelines for President's Park.

## *Circulator System*

One of the initiatives designed to improve circulation and reduce congestion in the heart of the city is a Circulator transit system. The concept of a Circulator, which would conveniently and efficiently transport residents, visitors, and workers in the Monumental Core, was included in NCP's Legacy Plan and is strongly supported by City and civic leaders. Initial implementation would make use of specially designed buses to move people between Downtown, the Mall and concentrated employment sites. While the routes are yet to be determined, one of these routes should provide service on Pennsylvania Avenue in front of the White House.



## *Outstanding Issues and Further Studies*

The Task Force believes that at least two additional areas of security technology should continue to be explored.

### Building Hardening

Although hardening of the White House is viewed as the last line of defense, further exploration into the feasibility of strengthening the building sufficiently is recommended. The extent of the hardening required is determined by the ability of the existing structure to withstand a specific type of attack combined with the desired level of protection. The feasibility of effectively strengthening or rebuilding the West Wing should also be explored.

Effective hardening/rebuilding of the White House complex may require major construction and the temporary displacement of the First Family and the White House staff. Significant operational issues would also need to be addressed.

### Future Technologies

Although technologies are not sufficiently developed for current use, some hold promise for the future. Explosives detection technologies, for example, have made great strides recently. However, they are not developed to the point where they can operate in an open air environment as exists on a city street screen to thousands of vehicles.

There are also new technologies under development to address a broad range of security issues including explosives detection and blast mitigation. Structural composite materials are being produced for use in new construction and upgrades that can significantly improve blast resistance. New metal compositions are being developed for blast and ballistic countermeasures.

Another developing technology is the use of electronic surveillance equipment. Surveillance and monitoring equipment may assist in identifying suspect vehicles or individuals. However, where this technology has been tested it has raised serious questions of privacy.

## NEXT STEPS

### *Public Review of Report*

This report transmits the professional planning recommendations of the Interagency Task Force to the National Capital Planning Commission. The Task Force recommends that the Commission approve these proposals and forward them to the President and Congress for their consideration and possible action. The Task Force expects that the Commission will not incorporate public testimony into this report. However, the Task Force strongly believes that the public should have the opportunity to express its views on the design and impact of security measures taken on its behalf. Consequently, the Task Force recommends that during the 45 days following the release of this report, the Commission hold one or more public information meetings and solicit public comment on these recommendations. The Task Force recommends that at the conclusion of the 45-day period, the Commission forward the public comments it has received to the President and Congress.

The public is invited to comment on this report, which is posted on NCPC's website at [www.ncpc.gov](http://www.ncpc.gov), by mail, email, or fax:

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These recommendations were formulated by a Task Force representing the federal and District of Columbia governments and reflect their general consensus on the important issues of security design in the Nation's Capital. In arriving at their conclusions, Task Force members consulted closely with numerous federal and local government agencies including the Department of Justice, the U.S. Secret Service, the Department of Transportation, the Commission of Fine Arts, the Architect of the Capitol, and the Advisory Council on Historic Preservation. In addition, Task Force members briefed Members of Congress during the course of their work. The Task Force expects that implementation of these recommendations will be undertaken in consultation with a broad coalition of business, community, historic preservation, and federal and local government partners.

### *Implementation*

#### Urban Design and Security Improvements

The Task Force recommends that the National Capital Planning Commission prepare an integrated Urban Design and Security Plan for Washington's Monumental Core to create a secure and distinguished public realm. As the federal government's central planning agency in the Nation's Capital, the National Capital Planning Commission is appropriately suited for this responsibility. The Task Force further recommends the establishment of a single and dedicated funding source for full implementation of the Urban Design and Security Plan. The programming and expenditure of all funds for priority project design and construction would require approval by NCPC, in much the same manner as the Commission reviews and approves the six-year Federal Capital Improvements Program for the National Capital Region, conducts an annual review and approval of each federal agency's capital budget requests and makes its recommendation to the Office of Management and Budget. Each agency would be required to design priority projects in accordance with the Urban Design and Security Plan.

In addition to performing its normal role as approving body for individual projects, NCPC would work with each agency to ensure that implementation is consistent with the guidelines specified in the approved Urban Design and Security Plan. The Task Force further recommends that the preparation of construction documents, bidding and construction of the projects be undertaken by an appropriate single agency (such as the National Park Service, the General Services Administration, or the D.C. government) as designated by Congress and the Administration.

As an additional step to ensure full implementation of the Urban Design and Security Plan, NCPC will work with each agency to formulate its budget estimates and conduct a review of individual plans for physical security improvements. We recommend that funding for each project be included as a part of a complete package, and that a single request be forwarded to the Office of Management and Budget and to Congress for immediate approval.



## PHASE I FUNDING REQUEST

The Task Force recommends that the federal government fund all costs associated with the development and ongoing implementation of the Urban Design and Security Plan, TSM measures (as identified in the traffic study), a Circulator, and tunnel environmental assessments, design, and engineering. If a tunnel is built, it should be a federal obligation to fund its construction.

<b>PROJECT COSTS</b>	<b>(\$ millions)</b>
<b>1) Urban Design and Security Plan</b>	<b>\$ 1.0</b>
Integrated urban design and security plan for federal precincts within the Monumental Core.	
<b>2) Transportation Systems Management Capital Improvements</b>	<b>\$ 1.0</b>
Cost-effective operational improvements to transportation system, including signal optimization, intersection improvements and signage, to improve traffic flow.	
<b>3) Pennsylvania Avenue Streetscape/Landscape (15th to 17th)</b>	<b>\$ 15.0</b>
Landscape improvements to create pedestrian-friendly and welcoming environment in front of White House	
<b>4) Circulator (capital costs)</b>	<b>\$ 15.0</b>
Cost of vehicles and improvements at stops (such as signs and benches)	
<b>5) Tunnel/Design &amp; Engineering/EIS</b>	<b>\$1.5</b>
Costs of preliminary design, and evaluation of environmental and historic impacts; preparation of EIS	
<b>6) Department of Justice Perimeter Security</b>	<b>\$ 5.0</b>
Streetscape improvements incorporating perimeter security.	
<b>7) Pennsylvania Avenue Streetscape, 3rd to 15th</b>	<b>\$ 50.0</b>
Update PADC/Pennsylvania Avenue streetscape design to incorporate appropriately designed security measures.	
<b>8) Washington Monument Exterior Security</b>	<b>\$ 10.0</b>
<b>Total</b>	<b>\$98.5<sup>1</sup></b>

<b>OTHER ONGOING COSTS</b>	<b>(\$ millions)</b>
<b>1) Transportation Systems Management (TSM) Maintenance</b>	<b>\$1.5</b>
Annual TSM maintenance costs, including \$1.05 million for traffic control personnel and \$450,000 for retiming of signals, management of lane restriction due to building construction and improved parking enforcement.	
<b>2) Circulator</b>	<b>\$11.0</b>
Annual operating costs for system, estimated by Downtown Business Improvement District (BID) and NCPC.	

<sup>1</sup>In addition, annual TSM maintenance and Circulator operating costs should be supported by the federal government.

## Transportation Improvements

Implementation of the Task Force's recommendations for Pennsylvania Avenue in front of the White House will require the President's concurrence and Congressional approval of funds to design, implement and maintain the proposed Transportation Systems Management (TSM) program; to conduct a detailed assessment of Pennsylvania Avenue and E Street tunnel options and, if approved, to design and construct a tunnel. Similar approvals and funding will also be required to implement the Circulator and to design and construct the landscape and security improvements associated with the closure of the Avenue within President's Park.

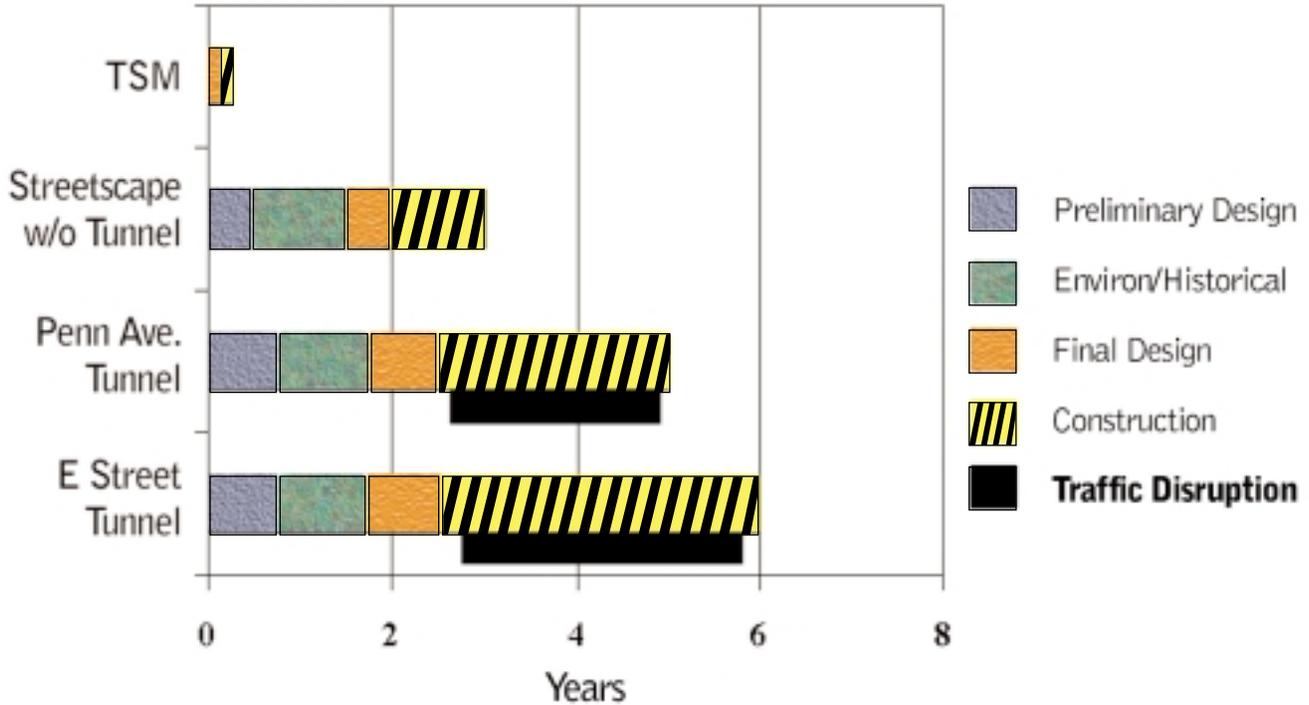
In accordance with the National Environmental Policy Act (NEPA), constructing a tunnel at this site would require preparation of an Environmental Impact Statement (EIS) and an historic preservation Section 106 review. That process would be followed by final design and construction. Depending on the alternatives selected,

the process would require five to six years before the tunnel could be opened to traffic. Estimated construction costs for the split portal, long tunnel and E Street tunnels described previously range from \$112 million to \$135 million (in 2001 dollars).

The Task Force finds that Pennsylvania Avenue in front of the White House has been unsightly and unresolved for too long. Therefore, the Task Force recommends that the street right-of-way be improved immediately; provided, however, that the federal government in allocating funds for such immediate improvements recognizes that these improvements may need to be modified or removed to permit construction of a tunnel if one is approved. Further, the federal government should recognize that the decision with respect to a tunnel option will not be negatively impacted by the cost of the improvements installed on Pennsylvania Avenue in front of the White House prior to a build/no build decision.

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## Design and Construction Schedule



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## ACKNOWLEDGEMENTS

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## APPENDIX

### *Prior Proposals for Pennsylvania Avenue in front of the White House*

#### John Carl Warnecke

In 1963, as part of his involvement with the preservation of the historic townhouses around Lafayette Park and the location and design of the New Executive Office Building, architect Warnecke proposed that Pennsylvania Avenue be closed between 15th and 17th Streets and replaced with a park-like promenade with a landscaped median and ornamental water features at the intersections of Jackson and Madison Places.

The Warnecke plan included increased stand-off distances, the potential for security checkpoints at 15th and 17th Streets, a safe and convenient pedestrian zone, and unification of the White House, Pennsylvania Avenue, and Lafayette Park into “President’s Park.”

#### Interagency Plan of 1996

After the 1995 security action – closing Pennsylvania Avenue – the National Park Service led an interagency effort to develop a plan that maintained the physical characteristics and appearance of a street so that it could be easily “reversible.” This plan would allow the street to be reopened to traffic in the event that the security environment or terrorist threat changed. The plan included a realignment of Pennsylvania Avenue to the north between Jackson and Madison Places. This so-called “Jefferson Bow,” named after a sketch prepared by Thomas Jefferson suggesting a curved alignment of Pennsylvania Avenue north of the White House, would marginally increase the stand-off distance from the White House in the event that the street were reopened to traffic.

Advantages of this plan include increased stand-off distances, the potential for security checkpoints at 15th and 17th Streets, a safe and convenient pedestrian zone, and unification of the White House, Pennsylvania Avenue, and Lafayette Park into “President’s Park.” Disadvantages include interruption of the street grid and the related traffic impacts; an adverse impact on Lafayette Park from the Jefferson Bow realignment of the Avenue; interruption of the L’Enfant “vista” along the Avenue; and inconsistency with the McMillan Plan.

#### Federal City Council

The Federal City Council plan, as described in the RAND Corporation study, is one of a number of streetscape and urban design plans that were proposed to reopen the Avenue. The plan was prepared by the architectural firm of Skidmore, Owings & Merrill.

This plan proposes that Pennsylvania Avenue be reopened to limited automobile traffic between 15th and 17th Streets. The premise is that traffic could be restricted to automobiles by the introduction of pedestrian bridges immediately east and west of Jackson and Madison Places. The limited clearance of the bridges would prevent trucks and other vehicles taller than automobiles from using the Avenue in front of the White House. The plan also incorporates the “Jefferson Bow” in a realigned Pennsylvania Avenue.

The Federal City Council plan includes reopening Pennsylvania Avenue to limited automobile traffic and restoring the street grid, as well as providing a slightly greater stand-off distance between the realigned Pennsylvania Avenue and the Executive Mansion. However the minimal increase in stand-off distance does not accommodate security requirements in that the overhead pedestrian bridges would not deter SUVs or heavily-loaded or multiple bomb laden automobiles. The bridges would also require ramping into both the White House and Lafayette Park (for ADA compliance) and ,together with the Jefferson Bow, would be adverse to the historic character and setting of the White House.

#### Other Plans

Other architects, including Arthur Cotton Moore and the firm of Franck Lohsen & McCrery, prepared plans in response to the closing of Pennsylvania Avenue. Their proposals were similar in concept and different in detail from the Federal City Council plan in the incorporation of fences and gates and the design of other security measures. The Moore plan proposed the innovative use of technology including vehicle weight sensors that would activate gates or retractable bollards to prohibit vehicles with excess weight. The plan also included a transparent glass “blast wall” inside the fence on the White House grounds. The plan by Franck Lohsen & McCrery also called for the reopening of Pennsylvania Avenue, but the firm retracted that plan in the wake of the terrorist attacks on September 11, 2001.

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The National Capital Planning Commission is the federal government's planning agency in the District of Columbia and surrounding counties in Maryland and Virginia. The Commission provides overall planning guidance for federal land and buildings in the region. It also reviews the design of federal construction projects, oversees long-range planning for future development, and monitors capital investment by federal agencies.



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