

**THE WASHINGTON MALL
CIRCULATION SYSTEMS**

**PREPARED FOR THE NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR, UNITED STATES OF AMERICA
BY SKIDMORE, OWINGS & MERRILL**

OCTOBER, 1973

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- o Commission of Fine Arts
- o D.C. Department of Highways and Traffic
- o National Capital Planning Commission
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The recommendations in this report reflect many of the basic guidelines set forth in the McMillan Park Commission Plan of 1901, as reinterpreted by the 1966 Mall Master Plan. Dan Kiley served as Consultant Landscape Architect and Wilbur Smith and Associates served as Traffic Engineers to Skidmore, Owings & Merrill on the 1966 Mall Master Plan.

The SOM personnel responsible for this project are:

Nathaniel A. Owings, General Partner
Edward C. Bassett, General Partner

David M. Childs, Associate Partner
George Dickie, Landscape Architect
Richard Giegengack, Architectural Designer
Kurt N. Pronske, Participating Associate

C. Norman Carlson, Participating Associate
Anthony Grammenopoulos
Sam Gross
Niva Kodilkar
Elizabeth Pearson
David Peetz
Janet Schaeffer

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Introduction

The Washington Mall in 1976 will be host to throngs of the patriotic and the curious, who will come to the capital city to celebrate 200 years of American independence. In heretofore unprecedented numbers people will visit the national museums and galleries framing one of the largest malls in the world. They will pilgrimage to memorials and monuments honoring the nation's most beloved leaders. Then, as now, residents of the Washington area as well as other visitors will use the Mall grounds for a variety of recreational and cultural activities. Regardless of their particular destinations on the Mall, these visitors will enjoy a grand outdoor place that reflects the deeply considered and sometimes profound ideas generated during a design effort that has been in process nearly as long as the nation is old.

While the Mall has grown in size and complexity since the concept was first articulated by Major Pierre L'Enfant in 1790, so has the country around it. Earlier plans envisioned people moving on the Mall in carriages or on foot. The insidious encroachment of the motor vehicle, with its noise and pollution, could not be foreseen. Neither could the coming of people from all parts of the nation and the world to visit the Mall buildings and walk within the great park. These radical changes in the Mall's uses were accorded full recognition in the 1966 Washington Mall Master Plan. The document presented

a conceptual framework that would allow the incongruous elements on the Mall-- structures and vehicles--to be removed and replaced with elements appropriate to the pedestrian character of this park. The 1966 Mall Master Plan also proposed rehabilitation of the existing landscape design as necessary.

With the approach of the Bicentennial it becomes imperative that the recommendations of the 1966 Plan be implemented to the fullest possible extent. Certain existing conditions must be changed both to assure a pleasant experience for the Mall visitor and to protect the Mall itself from abuse.

The 1976 Development Plan described herein was commissioned by the National Park Service to include design concept schematics for visitor circulation and related services to be executed by 1976. Skidmore, Owings & Merrill, architects of the 1966 Master Plan, were asked to develop a circulation network for tourmobiles, pedestrians, and bicyclists, indicating locations for visitor services, activities, and appropriate adjunct lighting and landscaping.

The proposals for this development are offered as a means for providing an efficient and aesthetically pleasing environment capable of accommodating the crowds of visitors expected on the Mall in 1976.

An Historical Look at the Mall

The Washington Mall of L'Enfant's plan was not a mall at all but a "grand avenue, 400 feet in breadth and bordered with gardens," connecting the future Capitol with the site of a monument located on a cross axis through the yet to be built President's House. For about fifty years the land lay essentially unused, but its importance as a potential federal park was not forgotten.

In 1848 construction on a modified design of Robert Mill's Washington Monument was begun 370 feet east and 125 feet south of the site designated by L'Enfant. The strict axial relationships in his plan were thus broken down, a disintegration that the prominent landscape architect Andrew Jackson Downing proposed to extend with his 1851 plan for the Mall. The Jackson Plan conformed to the English garden tradition of landscape design, obliterating the east-west axis in a network of curvilinear walks, undulating hills, and copses of trees "in the natural style." Only a portion of Downing's design was ever carried out. The plan produced by the McMillan Park Commission in 1901 mandated a return to L'Enfant's formalism while incorporating subtle compromises in favor of the romantic school. The Mall of today represents perhaps a 50 percent implementation of the McMillan Plan.

The McMillan Commissioners--Daniel H. Burnham and Charles F. McKim, architects; Frederick Law Olmsted, landscape architect; Augustus St. Gaudens, sculptor; and Charles Moore,

planner and journalist--sought to impose order on the rapidly increasing and distressingly random development in the Mall corridor, symbolized by the intrusion of the Baltimore and Potomac Railroad onto the Mall in the 1870s. With a bow in the direction of the English garden, the Commission translated L'Enfant's "grand avenue" into an "expanse of undulating green." The 1 1/2 mile long lawn would be walled on either side by "elms, planted in formal procession four abreast," with a distance of 300 feet between the trunk line on each side. To recall L'Enfant's formal design, the east-west axis of the L'Enfant avenue had to be slightly rotated to align with the Washington Monument. The great green carpet in the McMillan Commission's drawings was bordered with "parklike" carriage drives between walkways, with federal buildings lined along the outside edges facing each other across the green. Recognizing the "richness and beauty of certain notable avenues in England" that had six or more parallel rows of trees on either side, the Commission asked for not fewer than four rows of elms to be planted in the tree panels on the Mall.

In the 1930s, after the National Capital Park and Planning Commission had reconsidered and slightly revised the McMillan Plan, portions of it--particularly between the Capitol and the Washington Monument--were implemented essentially as they appear today. Seedling elms were planted in four rows along a nearly flat, 300 foot wide green. Where the McMillan Plan called for narrow carriage roads within this greensward with walks about

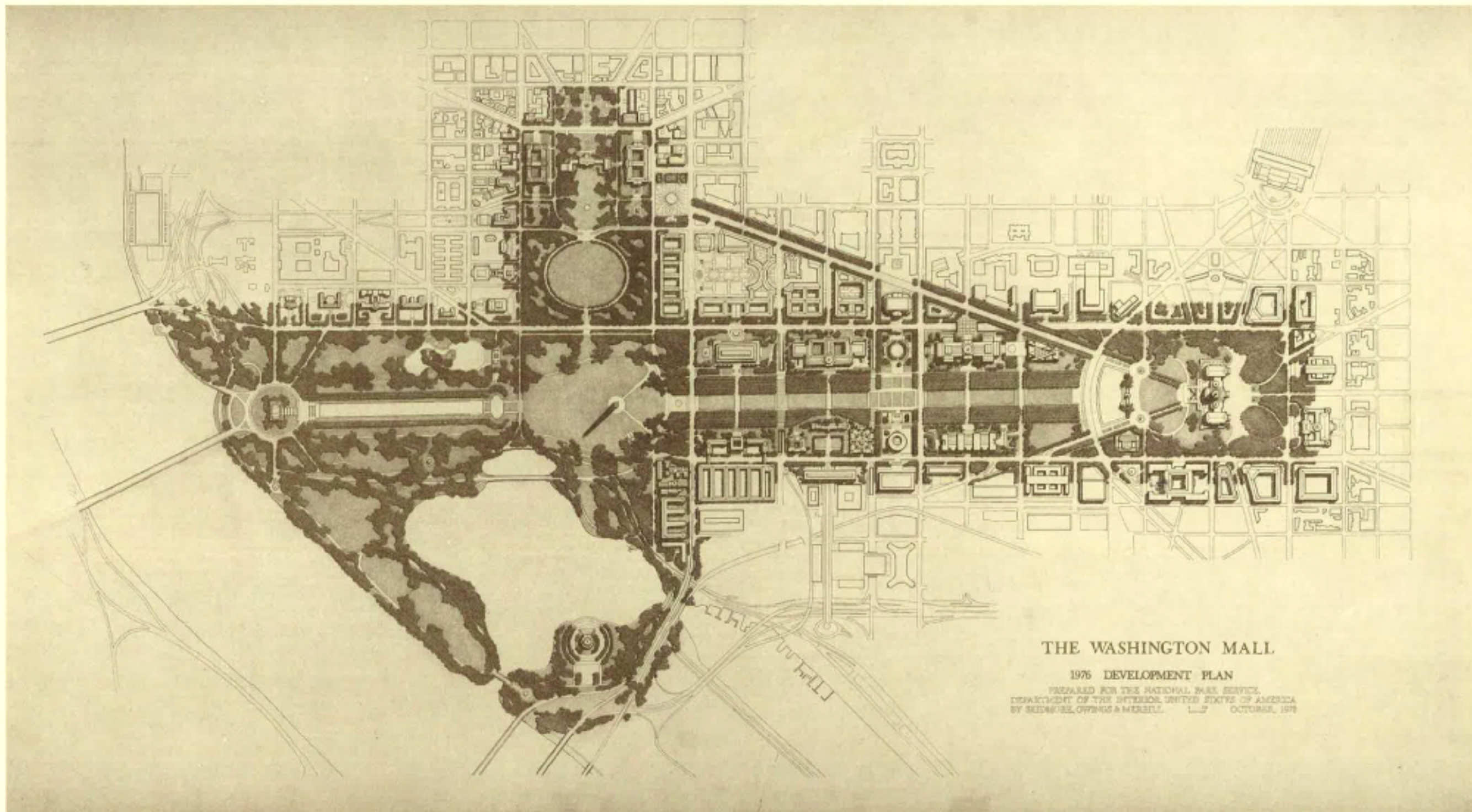
six feet wide on their sides, the streets in their place today are each thirty feet wide with a 10 foot wide paralleling sidewalk. The outer roadways next to the buildings are even wider.

The McMillan Commission turned its greatest attention to designing an appropriately dignified base for the Washington Monument. An intricate sunken garden was proposed, to be surrounded by terraces with fountains and templelike structures--"the gem of the Mall system." In its stead now is the original graceful green hill, undulating in delightful contrast to the formal east Mall. Remnants of romanticism are apparent on the west side of the Monument grounds and particularly in West Potomac Park.

By the 1960s a nearly full complement of public buildings had taken their places along the edge of the Mall. Although the basic features of the L'Enfant and McMillan Plans were recognizable--a tribute to their strength--failures of certain aspects of the design and the need to implement other aspects had grown increasingly apparent. The four east-west "carriage drives" had become parking lots for charter buses and cars, including, during weekdays, those of downtown Washington commuters. Masses of "temporary" buildings erected on the Mall during the First and Second World Wars conspired with the traffic to spoil the Mall ambience. The ranks of elms were straggling as they marched down the length of the green. Dutch elm disease and the various construction programs had taken their toll. The inadequacy

of restaurant facilities in the museums had led to the policy of selling food from open stands on the Mall, and as a result the grounds were badly littered with paper and garbage.

The Mall in its present form is not a satisfactory pedestrian environment. The 1966 Washington Mall Master Plan, intending to restore the pedestrian to his rightful role, prepared a series of concepts to guide future development on the Mall. These concepts were endorsed by the various reviewing agencies in 1966 to include installations of varied planting to enhance year-round attractiveness; provision of visitor refreshment, orientation, and resting facilities without intruding on the open areas; elimination of incompatible and unnecessary buildings; removal of major surface traffic from park areas; provision of a public transit system on the Mall; increasing opportunities for recreational and cultural opportunities for Washington area residents; and defining the 8th Street Axis to emphasize its relationship to the city.



THE WASHINGTON MALL

1976 DEVELOPMENT PLAN

PREPARED FOR THE NATIONAL PARK SERVICE,
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BY SIDMORE, OWINGS & MERRILL. 1:12 OCTOBER, 1976

1976 Development Plan

The drawing titled 1976 Development Plan indicates those Washington Mall projects that are anticipated to be implemented by the Bicentennial. These projects are consistent with the guiding principles articulated by the 1966 Mall Master Plan. The additional development proposed in 1966 has not been included in this drawing because it could not be implemented by 1976. However, no recommendation included in the 1966 study would be precluded from realization after the Bicentennial. Construction of the recommended tunnel to carry the South Leg Freeway under the Mall area, for example, could not possibly be completed. Therefore, traffic will continue to use 17th Street and the several park drives in the west part of the Mall in 1976. Similarly, although the 1966 Mall Master Plan called for tunneling 15th, 14th, 7th and 4th Streets where they cross the Mall, this construction also could not be completed by 1976 and these roads will remain open to vehicular use.

On the other hand, construction of Ceremonial Drive as recommended by the 1966 Plan is possible by 1976, according to the District of Columbia Department of Highways and Traffic and the 1976 Development Plan was created with the expectation that this road will be completed.

Major facilities other than the proposals contained in this study that will be available for the Bicentennial visitors include the National Visitor Center at Union Station,

the East Building of the National Gallery of Art, the Air and Space Museum, the National Sculpture Garden, the Hirshhorn Museum and its outdoor sculpture garden, redevelopment of the Smithsonian gardens at the 10th Street axis, a Metro entrance on the Mall, and the development of Constitution Gardens between 17th and 23rd Streets north of the Lincoln Memorial Reflecting Pool. Also anticipated but not included in the drawing--because feasibility and program studies are currently underway by a consultant to the National Park Service--is a new underground visitor facility at the Washington Monument.

It is important to note that no guiding recommendation included in the 1966 Master Plan would be precluded from realization after the Bicentennial by virtue of the immediate development proposed in this study.

Summary Recommendations of the 1976
Development Plan

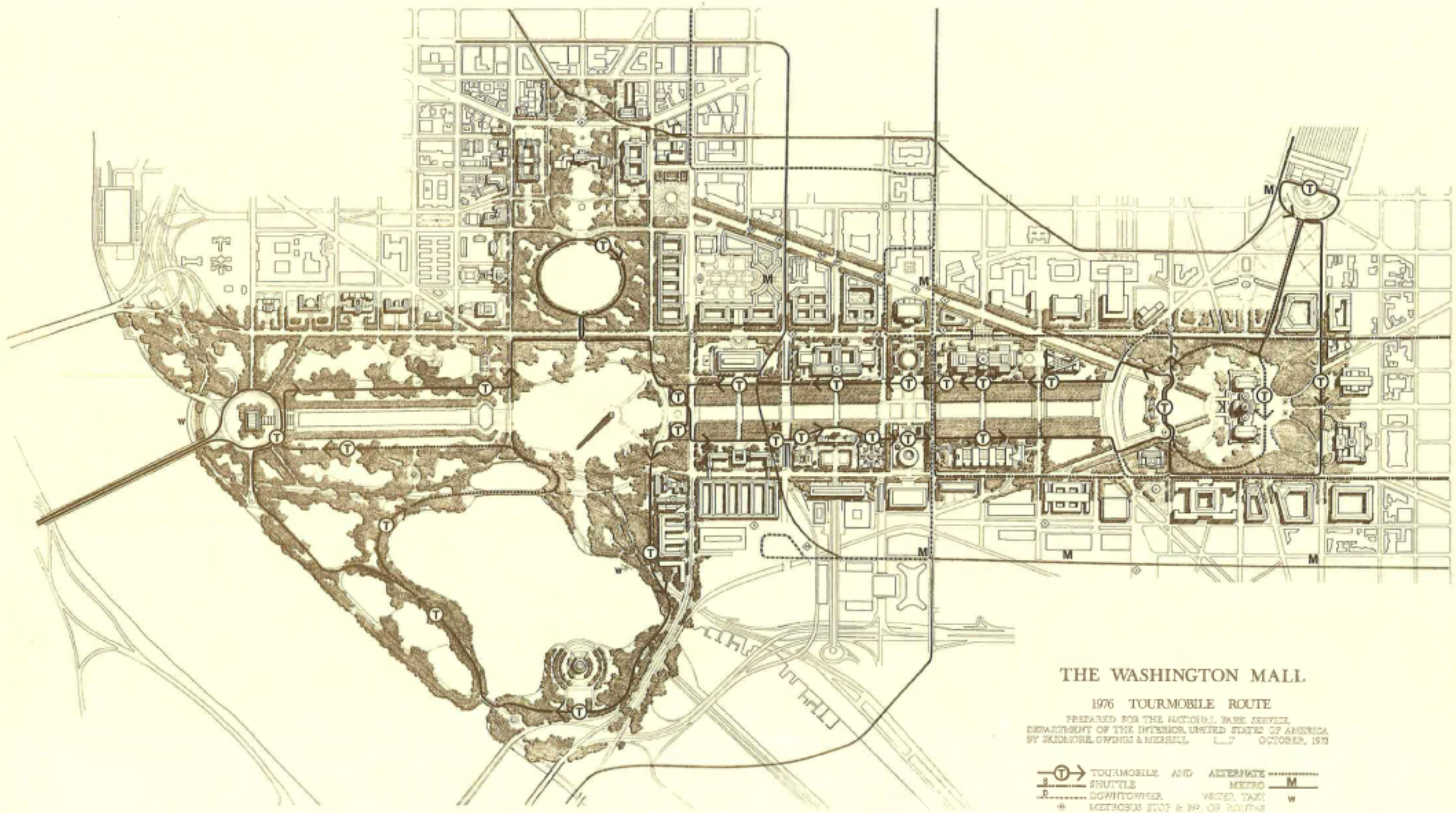
This study of the design concept schematics for visitor circulation systems and related services to be implemented by 1976 has as its area of primary concern the portion of the Mall between Madison and Jefferson Drives from the U.S. Capitol to the Washington Monument. Due to their integral relationships to this area, however, certain overall Mall recommendations are set forth:

- a. The Mall development anticipated by the 1976 Bicentennial.
- b. The definition of a tourmobile route that may be utilized by 1976.
- c. The location of visitor services throughout the Mall, including activity zones/exhibits/interpretive facilities; information/film/tourmobile ticket sales; outdoor refreshments; bicycle rentals; restaurants; cafeterias/organized sports/informal recreation; and rest rooms.

For the Mall area between the museums from 1st to 15th Streets the general recommendations include:

- a. The replacement of Madison, Washington, Adams, and Jefferson Drives with new circulation networks for pedestrians, bicyclists, and tourmobile buses and service vehicles.

- b. The installation of new plantings in this area, both informally between the tourmobile roadways and the museum buildings, and formally as a new row of trees along each of the inner pedestrian walkways.
- c. The definition of specifically zoned areas under the canopy of the existing elm tree plantations for visitor services within the proposed broad pedestrian allées, activities within the grass areas, and grass preserves.
- d. The development of a new lighting system incorporating the existing Mall light standards to permit use of these areas and enhance the visual characteristics of the Mall design during the evening hours.
- e. The development of Ceremonial Drive, which will enable the removal of 3rd Street and the closing of 1st Street to vehicular traffic other than the tourmobile.
- f. The development of an important tourmobile interchange and pedestrian gathering point between 14th and 15th Streets that envisions minor regrading of 14th Street between Madison and Jefferson Drives and minor regrading and realignment of 15th Street at the base of the Washington Monument.



THE WASHINGTON MALL.

1976 TOURMOBILE ROUTE

PREPARED FOR THE NATIONAL PARK SERVICE,
DEPARTMENT OF THE INTERIOR, UNITED STATES OF AMERICA
BY SKIDMORE, OWINGS & MERRILL. OCTOBER, 1973

- T
M
W
- T → TOURMOBILE AND ALTERNATE SHUTTLE
- M METRO
- W WATER TAXI
- + METRO'S STOP & NO. OF ROUTES

1976 Tourmobile Route

The influx of visitors to the Mall area in conjunction with the 1976 Bicentennial celebration will place a heavy demand on the tourmobile service. The tourmobile has proved to be a highly effective means of visitor transportation between Mall destinations. It is also regarded as an enjoyable ride in itself, and some thirty percent of the tourmobile riders stay aboard for the entire round trip. In 1976 a much greater number may be expected to make the tourmobile round trip when the many Mall attractions--museums, galleries, and government buildings--are crowded with Bicentennial visitors. The tourmobile circuit would be the only Mall activity for some of these people while for others the initial round trip would serve as an orientation to the Mall in preparation for subsequent visits to individual attractions. The proposed 1976 tourmobile circulation route has been laid out to satisfy these two goals: to distribute large numbers of people efficiently between points of interest and to carry others on an enjoyable narrated tour.

At present, tourmobiles must share city streets with other vehicles and travel at normal city speeds throughout much of their circuit. On the east part of the Mall they use Madison and Jefferson Drives, crossing onto Adams and Washington between 3rd and 6th Streets. There is no direct service to the U.S. Capitol. West of the Washington Monument the routes travel past the Jefferson and Lincoln Memorials and the Ellipse,

using 15th Street, Constitution Avenue, and several drives in West Potomac Park. The proposed 1976 network would replace the four longitudinal drives east of the Washington Monument with two narrower and attractively surfaced tourmobile roadways. West of the Monument, the route would use new auto-free roadways for about a third of its distance, with the remaining portion continuing on the existing streets. The long trip in fast-moving traffic on Constitution Avenue would be avoided.

The proposed 1976 tourmobile route would provide access to all the points of interest presently served by the tourmobile as well as some additional attractions. (See drawing titled 1976 Tourmobile Route.)

Two basic criteria that governed the design of the 1976 tourmobile network were to insure a leisurely, pleasant, and informative ride and to provide the maximum flexibility possible for future routes and service. The number of visitors expected in 1976 is estimated at widely differing levels, but it is agreed that the figure will most probably be nearly double the present visitation. The tourmobile system must be highly flexible in order to accommodate these visitors, whose peak use demand will vary widely according to the season and time of day and the scheduling of major Bicentennial activities.

The 1966 Mall Master Plan proposed a system of seven separate loops for the tourmobile, a network that was refined in subsequent studies to three basic loops. In practice it

has been found that a figure-eight-type loop offers the greatest advantages in terms of visitor service and flexibility, avoiding the congestion at interchanges that would occur if riders interested in making the round trip were required to transfer to another vehicle. Riders headed for a particular destination near the end of the line may transfer at an interchange to a returning tourmobile as a short cut. During times of heavy use additional tourmobiles could be routed over each of the component loops within the figure-eight-type network to further avoid congestion at the interchange points.

In the basic circulation pattern for tourmobiles in 1976 the vehicles would move among three interlocking loops. The chief terminal for the tourmobiles would be the National Visitor Center at Union Station.

The first loop within the system would serve the United States Capitol, following 1st Street east past the Senate Office Buildings, the Supreme Court Building, and the Library of Congress, and stopping near the front of the Capitol. A possible post-1976 alternate route indicated on the plan would take the tourmobiles across the Capitol's East Plaza. This route could be implemented only after the Capitol grounds are closed to auto traffic, a proposal that would be permitted by the construction of a parking garage under the East Plaza. If traffic conditions are favorable, it may well be decided to retain the 1st Street East tourmobile route even after the Capitol East Plaza is freed of auto traffic because of the variety and number of

government buildings that the tourmobile would continue to pass and because of the splendid view the route affords of the Capitol through the trees along East Capitol Street.

The first of the two tourmobile interchange points connecting the interlocking loops would occur between the Capitol Reflecting Pool and the west Capitol grounds. The location was chosen so the vehicles could be tucked beneath the trees where their activity would not disturb views from the Capitol grounds or from the Washington Monument. Visitors who debark at this point would be able to view the west facade of the Capitol and the Olmstead Terraces on the Capitol grounds and visit the magnificent Grant Memorial, one of the finest examples of public art in the city. The location affords a grand view across the recently completed Capitol Reflecting Pool of the Mall and the Washington Monument. The tourmobiles would travel through this area on 1st Street West, which would be closed to automobile traffic and made narrower for tourmobile use alone after Ceremonial Drive is constructed.

The tourmobiles would follow the new roadway on the north side of the Mall to the second and most important tourmobile interchange point, which would be located between 14th and 15th Streets. This area is the most logical to be developed as a pedestrian plaza because it is the halfway point on the Mall and because studies by Landmark Services, Inc., operators of the tourmobile concession, demonstrate it to be a natural congregating

point for people as they end their visits to the museums and begin the procession up to Washington Monument. The proposed plaza would be an excellent vantage point for views of the Monument. Aesthetically, it would mark the transition between the classic design of the east part of the Mall and the rolling pastoral landscape to the west.

West of the 14th-15th Street plaza the tourmobile would make a clockwise circuit past the Jefferson Memorial, through West Potomac Park, and past the Lincoln Memorial, using the east hemisphere of Lincoln Circle, which will be closed to automotive traffic by 1976. An alternative route indicated on the plan through West Potomac Park would follow the existing drive past the site of the proposed Franklin Delano Roosevelt Memorial near the Tidal Basin. The tourmobile would then utilize a new roadway through the area of West Potomac Park in which an expanded National Folk Festival may be located in 1976. From the Lincoln Memorial the vehicles would follow another new roadway through the proposed Constitution Gardens area near the Lincoln Memorial Reflecting Pool. The precise alignment of this roadway would be developed during the design of Constitution Gardens. The tourmobiles would follow 17th Street northward to Constitution Avenue, where a new roadway would be built between 17th and 15th Streets adjacent to Constitution Avenue on the Washington Monument grounds. This new segment would permit the separation of tourmobiles from the concentrated traffic moving at higher speeds along Constitution Avenue. After making a circuit of the Ellipse, the

vehicles would recross the 14th-15th Street plaza and take the south roadway (over what is now Jefferson Drive) to 1st Street Southwest and the interchange at the Capitol Reflecting Pool. The network would be completed as the tourmobiles returned to the National Visitor Center.

The most likely tourmobile stops are indicated on the Plan. In the east part of the Mall the entrances to all the museums and galleries may be served. Two additional stops are indicated for the Metro entrance on 12th Street and the National Park Service shuttle bus stop on 7th Street. The tourmobile stops west of the Washington Monument would provide access to all the points of interest presently served and to the proposed new attractions.

The basic circulation system thus described and illustrated on the Plan could be expanded according to seasonal demand through the addition of loops serving numerous Washington area attractions. These loops would utilize city streets, and their feasibility should be determined by the National Park Service in coordination with the District of Columbia Department of Highways and Traffic. For example, one loop might serve the Federal Triangle area, thus allowing access to the Constitution Avenue side of the Smithsonian Buildings and the National Gallery as well as the 8th Street Axis to the north. The redevelopment envisioned by the Pennsylvania Avenue Development Corporation, including the new FBI Building, would also be served on this route. Another loop might pass the

White House on Pennsylvania Avenue and serve Lafayette Park, the Renwick Gallery, and the Corcoran. Other more distant destinations often mentioned as desirable attractions that might be served by tourmobiles are the National Zoo, Rock Creek Park, and the C & O Canal.

Service to these various places of interest would be permitted by either an extension of the tourmobile figure-eight-type system or the addition of a separate loop to which riders of the basic system could transfer. A variation on these approaches might use shuttle services between points along the Mall tourmobile route and other heavily used areas such as the Kennedy Center for the Performing Arts and the Arlington National Cemetery, to which a shuttle now leads from the Lincoln Memorial tourmobile stop.

The tourmobile buses in service today have demonstrated their functional value. Eighty-eight people can be seated comfortably on one two-section train. In the future consideration should be given to replacing these buses over time with vehicles demonstrating the most recent advances in nonpolluting, energy-conserving, quiet methods of ground transportation and representing the finest quality in industrial and graphic design. There is perhaps no better showplace in the nation for such demonstrations, which could be sponsored jointly by the National Park Service and the Department of Transportation.

The new tourmobile roadways would be shared by bicycles, which are considered compatible with tourmobiles for several reasons. The tourmobiles are recommended to average no more than seven to ten miles per hour on the

¹ Service and emergency vehicles that presently use the Mall

National Park Service trash removal vehicles
Government Services, Inc. trash removal vehicles
Government Services, Inc. delivery vehicles
Government Services, Inc. armored car
Government Services, Inc. inspection station wagons/surveillance
National Park Service maintenance vehicles/horticulture servicing
National Park Service personnel station wagons
Charter buses
Utility company service vehicles
Plumbing/electrical service (non-utility companies)
National Park Service police cars/scooters
Fire/Ambulance emergency vehicles

Mall. Bicycles typically travel at equal or higher speeds. The twenty foot tourmobile roadways would provide ample room for the two vehicular systems and would be surfaced with a hard modular paving appropriate for both. On the other hand, bicycles are very dangerous to pedestrians because they travel silently at speeds much faster than walking. Consideration was given to the designation of an entirely separate circulation system for bicycles, but the idea was discarded because it would be impossible to effectively discourage the pedestrians from using these separated bike ways. Bicycles, however, would be unlikely to use the proposed pedestrian paths because these would be paved with compacted crushed stone, an undesirable surface for bicycling.

The only other vehicles that will be permitted to use the tourmobile roads are service and emergency vehicles.¹ Unloading and loading of charter buses at the Mall museums would take place on Constitution and Independence Avenues rather than from Madison and Jefferson Drives, as presently occurs. Further, the circular driveways in front of the museums could be modified if necessary to permit the buses to enter, thus freeing the Avenues from traffic flow obstacles. The National Park Service in concert with the museums and galleries is urged to implement a call-up system in an effort to schedule and distribute the departures and arrivals of the charter buses to avoid congestion. If the number of buses is too great for the driveways to handle even when they are properly scheduled, curb cuts could be made along

Constitution and Independence Avenues to create pull-off lanes from which the buses could discharge and load passengers. As a final option, additional loading areas might be established elsewhere. One such location could be provided by the drives flanking 12th Street at its north tunnel portal. Another space capable of such development might be the land between the 12th Street south tunnel portal and the Department of Agriculture Building near the new Mall Metro entrance. It is strongly urged that every such effort be made to exclude all buses from the Mall. The heat and fumes are dangerous to the plant life, and the noise, scale and speed of the buses are detrimental both psychologically and physically to pedestrians' enjoyment of this potentially tranquil area.

The vehicular circulation design provides exchange points for other public transportation systems that bring visitors to the Mall. The District of Columbia municipal buses (Metrobuses) make many stops within walking distance of the Mall. The number of routes stopping at particular points are indicated on the Plan. Although minor alterations in the Metrobus routes are continually made, and although the routes are expected to undergo two major changes between now and 1976, the map accurately reflects the relative density of Metrobus lines that serve the various stops near the Mall. Among the stops used by the greatest number of Metrobus routes is the Washington Terminal on 10th Street between Pennsylvania and Constitution Avenues. No automobile traffic is permitted on this block of 10th Street, so it is a par-

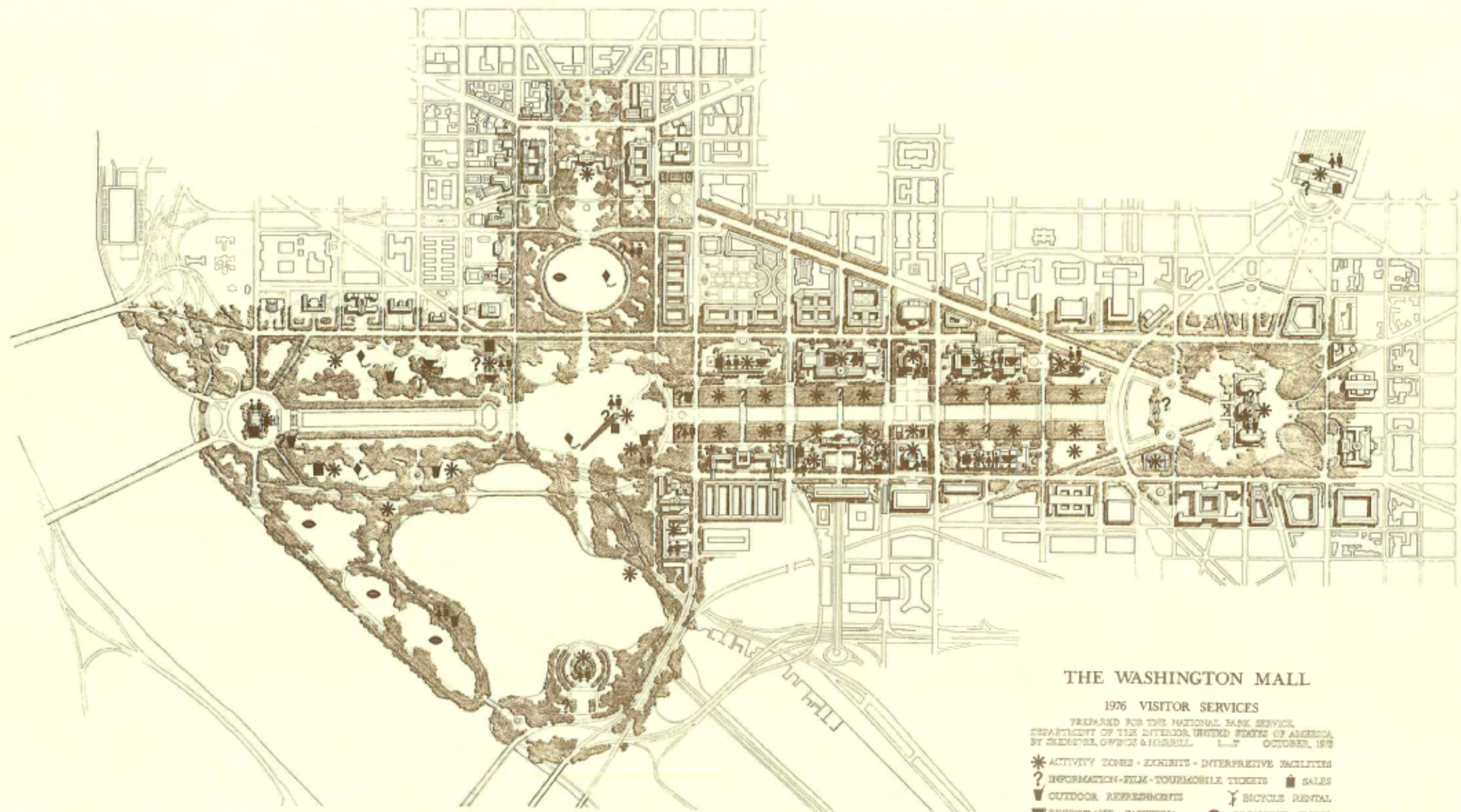
ticularly desirable point of debarkation for visitors bound for the Mall a block away. Other heavily used stops are the intersection of 14th Street and Constitution Avenues and the Southwest Terminal, which serves residential and government buildings a short distance south of the Mall.

The National Park Service has announced intentions to provide shuttle bus service to the Mall from outlying parking areas by 1976. This program will be initiated on a trial basis in summer 1974 when Madison, Adams, Washington, and Jefferson Drives will be barricaded and visitors directed to the parking lot at the Robert F. Kennedy Stadium. A projected route for this shuttle as it approaches the Mall is shown on the Plan. This route will be revised upon completion of the National Visitor Center and upon observation of the success of trial routes. The dropoff point on the Mall for the shuttle buses will be located in the vicinity of the National Gallery on 7th Street. In 1976 another shuttle from the Pentagon parking lot to the Constitution Gardens area of the Mall may be put into operation on weekends.

By 1976 three Metro lines (see Plan) will stop within walking distance of the Mall. One of these stops will be located within the Mall on 12th Street at the edge of the tree panel between what are now Adams and Jefferson Drives. A potential future stop on the 7th Street Line is provided for in the vicinity of the National Gallery. A major Metro stop will serve the National Visitor Center at Union Station.

It is most important that Metrobus routes be tailored to meet the additional visitor demands of 1976. It must be remembered that many of the Mall visitors will be Washington metropolitan area residents. These people will rely heavily on Metro and Metrobus service and will not use the shuttle service from the fringe parking lots to the extent that the national visitor will. If the Metrobus service, which is currently scheduled primarily for commuters, is not adapted to serve tourists on weekends and non-rush hours, these local residents will be encouraged to continue to rely on their automobiles.

The "Downtowner" bus, a shuttle that presently runs from just south of Dupont Circle to the Federal buildings in southwest Washington primarily servicing downtown shoppers, is potentially useful for visitors as well. It is an attractive vehicle that operates at low fares and presently passes through the Mall on 7th Street (as shown on the Plan). Consideration should be given to making it a more integral part of the tourist circulation system in Washington. The service might, for example, be used to carry tourists to restaurants outside the Mall, thus relieving pressure on Mall food service facilities during periods of heavy visitation. Expanding the Downtowner route would benefit both tourists and Washington area residents by giving the visitors the opportunity to see more of downtown Washington while allowing people who work in downtown Washington to make short visits to the Mall. The national visitor would thus be more



THE WASHINGTON MALL

1976 VISITOR SERVICES

PREPARED FOR THE NATIONAL PARK SERVICE,
DEPARTMENT OF THE INTERIOR, UNITED STATES OF AMERICA
BY JENNIFER OWENS & IAN BULL L.S. OCTOBER, 1973

- * ACTIVITY ZONES - EXHIBITS - INTERPRETIVE FACILITIES
- ? INFORMATION - FILM - TOURMOBILE TICKETS
- ☐ SALES
- ☒ OUTDOOR REFRESHMENTS
- ☒ RESTAURANT - CAFETERIA
- ☒ REST ROOMS
- ☒ BICYCLE RENTAL
- ORGANIZED SPORTS
- ☒ INFORMAL RECREATION

aware of Washington as a working city rather than solely as a Federal precinct.

A water taxi service has been discussed as a potentially pleasant method of travel to the Mall. Possible docking areas for water taxis are indicated on the Plan at the Water Gate on the Potomac River south of the Lincoln Memorial and in the Tidal Basin, pending determination of whether the locks between the river and the basin can be modified to accommodate the water taxi.

1976 Visitor Services

The 1966 Mall Master Plan took note of the necessity for providing various services to the increasing numbers of Mall visitors and the importance of keying those services to the needs and interests of local residents as well as out-of-town visitors. The point was made then and is reiterated now that no matter how great the demand, visitor services and facilities cannot be allowed to proliferate to the extent that they intrude on the dignity and beauty of the Mall. The 1976 recommendations for visitor services were developed with the goal of providing basic comforts and activities to make the Mall visit pleasant and rewarding while carefully preserving and enhancing the character and ambience of the Mall landscape.

Several types of visitor services are indicated on the drawing titled 1976 Visitor Services. The symbols designate only the nature of the activity and its location; they do not represent levels of intensity. Sales services, for example, vary from the relatively small-scale distribution of pamphlets at the Lincoln Memorial to the large crafts and publications gift shops in some of the museum buildings.

On the east part of the Mall between the Washington Monument and Ceremonial Drive information would be provided and tourmobile tickets and film sold from kiosks along the new pedestrian allée next to the tourmobile roadways under the trees. A location is

proposed near the new Metro stop for the rental of bicycles.

Restaurants and cafeterias are currently located in the museum and gallery buildings on the east part of the Mall. In addition to these facilities, new food services will be provided in the National Air and Space Museum, the East Building of the National Gallery of Art, the National Sculpture Garden, and the proposed Constitution Gardens. New outdoor refreshment stands would be located under the trees in the plaza area between 14th and 15th Streets and in several locations in West Potomac Park.

It is recommended that no outdoor food facilities be provided east of 14th Street because of the tremendous problems of trash collection and litter cleanup associated with the outdoor sale of food in this heavily visited portion of the Mall. Under present conditions trash is collected twice daily from the Mall grounds. (This collection, which is managed by the National Park Service, does not include refuse from the museum buildings or concession stands.) Trucks equipped with hydraulic compactors must carry their 7-8 cubic yard loads of garbage on 2 1/2 hour round trips to a landfill site in Lorton, Virginia. The trash, which consists largely of paper, is generated at the average rate of 18 cubic yards per day. During the 1973 National Folk Festival on the Mall trucks were dispatched at the rate of one per hour. It is anticipated that the expected increase in visitation by 1976 might require continuous operation of trash collection trucks.

Much of the refuse ends up on the ground as litter. The proliferation of discarded garbage has contributed toward a population explosion among rats on the Mall. These rats are thought to damage the landscaping on the east Mall.

To cope with the trash collection and litter cleanup problems, it is recommended that the operators of the few outdoor refreshment kiosks proposed west of 14th Street be required to limit the use of excess paper packaging. It is further recommended that the National Park Service undertake a feasibility study for the future installation in this area of an automated trash collection system such as the one in operation at Disney World in Orlando, Florida. The very high cost of such a system could be shared among the several government-sponsored institutions on the Mall and the National Park Service.

Rest rooms are available in the east part of the Mall in the museum and gallery buildings. New buildings in this part of the Mall--including the National Air and Space Museum, the East Wing of the National Gallery, the Hirshhorn Museum, and the National Sculpture Garden--will provide additional comfort facilities. The area between 14th and 15th Streets would include new rest rooms concealed in the tree bosks. Comfort stations would also be included in the new visitor facility at the base of the Washington Monument, at Sylvan Theater, at a new structure in West Potomac Park, and at several places in the proposed Constitution Gardens, in addition to the Lincoln and Jefferson Mem-

orials. No separate above-ground rest room facilities are recommended for the east part of the Mall grounds because it is felt that such buildings would be inappropriate uses of this very valuable land. Underground rest rooms are not recommended because many people feel ill at ease using them. Recently, the National Park Service has had to close two underground rest rooms in the Mall area due to security problems.

As indicated on the plan, locations for exhibitions and interpretive programs cover a wide range from major museums to the areas under the trees on the east part of the Mall. Areas indicated as sites for outdoor activities represent potential locations only and their use must be determined according to the type and duration of activity. The areas under the elm plantations are suited to activities such as temporary outdoor displays, exhibits, and performances. Activities of longer duration and greater intensity are more appropriate for the areas west of the Washington Monument. In selecting locations for particular activities, consideration should be given to the fact that the part of the Mall between the Washington Monument and the Capitol is already heavily used and is the area least able to absorb new activities that will generate even more users. It would be desirable to locate certain kinds of activities, especially those that will draw many users over longer periods, in the parts of the Mall that are relatively little used at present. A variety of informal and organized recreational opportunities are available on the Mall, ranging from picnicking, walking and bi-

cycling to tennis, polo, and other sports. Sites for the participatory sports are provided now in West Potomac Park and would be maintained and augmented in 1976.

Plan: 1st to 15th Street

The portion of the Mall that will undergo the greatest physical change between now and 1976 is the Grand Axis between the museum buildings from Ceremonial Drive to 15th Street. The scheduled removal of the east-west drives will affect a substantial portion of the land in this area. Of necessity, therefore, the design concept recommendations for this portion of the Mall are the most detailed. (See drawing titled Plan: 1st to 15th Street.)

The major museum buildings face each other across the Mall on oblong sites corresponding to double city blocks in the Washington street system. The three largest sites, nearly identical in size, are located between 4th and 7th Streets, 9th and 12th Streets, and 12th and 14th Streets. The National Gallery of Art and the new National Air and Space Museum; the Museum of Natural History and the building complex including the Arts and Industries Building, the old Smithsonian Building and the Freer Gallery; and the Museum of History and Technology and the Department of Agriculture building occupy these three sites respectively with their entrances located opposite each other at the midpoints along the east-west sides of the rectangles. Pedestrian cross-Mall pathways would lead between these museum entrances, replacing 6th and 13th Streets and the double pathways at 10th Street.

Variations in this basic structure occur at the termini--between 14th and 15th Streets and between 4th Street and Ceremonial Drive--and at the 8th Street Axis. The proposed landscaping treatment of these areas would vary from the patterns established for the three basic two-block oblongs.

The land between 7th and 9th Streets on the Mall is part of a major city cross axis extending from south of the Mall to Pennsylvania Avenue, the National Portrait Gallery, and beyond. This 8th Street Axis, thus named because of its orientation to 8th Street, is an important urban design feature of L'Enfant's plan for the city of Washington. In actual design, however, this axis gains its importance over much of its length not just from the imaginary single axis line, but from the pair of streets that frame it. This is particularly true as the axis passes through the proposed Market Square immediately to the north of the Archives Building and as it passes through the Mall. Thus, in order to achieve a clear definition of the 8th Street Axis where it crosses the Mall, a recommendation is made to emphasize these side streets by planting double rows of trees on the west side of 7th Street and the east side of 9th Street between Constitution and Independence Avenues, leaving the line of the two streets as well as the center panel open. These rows have already been established at several points along the two streets on the Mall. The eventual

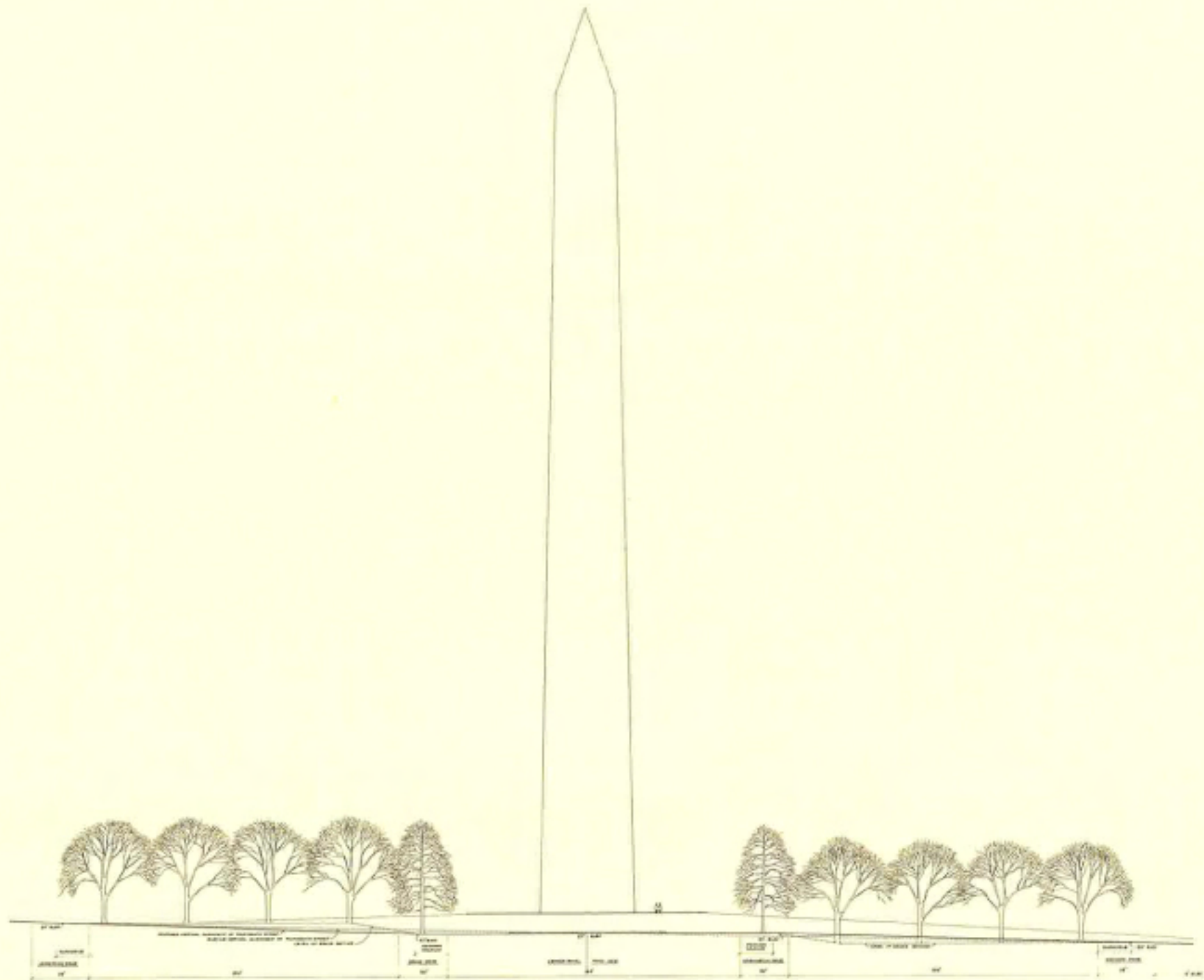
extension of the trees up into the Market Square area along Pennsylvania Avenue is recommended.

The east edge of the 8th Street Axis as it crosses the Mall is travelled by 7th Street and its flanking sidewalks. In order to maintain symmetry and reinforce the west edge of the axis, the 9th Street Mall crossing--which is tunneled--would be defined on the surface by two parallel pedestrian paths corresponding to paths on either side of 7th Street. The paths would be placed the same distance apart, approximately 120 feet, as the two sidewalks along 7th Street. The same dimension would control the placement of the paths flanking the other two cross streets, 4th and 12th (the latter of which is tunneled). This treatment would impart a regular rhythm to all the crossings even though the streets themselves are of different widths or are tunneled below the surface.

When Ceremonial Drive is constructed across the Mall at the foot of the Capitol, traffic that presently uses 3rd Street would be accommodated by the new drive, and 3rd Street would be removed where it crosses the Mall. The opening of the Center Leg Freeway in 1973 is also expected to carry some of the traffic that currently uses 3rd Street. The tree panels are recommended to be extended about 100 feet (two rows of trees) to the east, over land now occupied by 3rd Street. The grass under the tree panels would end in a curve repeating the curve of Ceremonial Drive, while the remaining area between the edge of

the tree panels and the Drive--approximately forty-five feet--would become a pedestrian path. This path, to be paved in the crushed compacted stone of the rest of the proposed pedestrian paths in this area, and in harmony with the already constructed area east of Ceremonial Drive, would be extended and widened slightly between the tree panels, respecting the squared end of the central grass panel. This area would meet the green-sward approximately a hundred feet west of Ceremonial Drive. It would afford a place for magnificent views of the Capitol Reflecting Pool and the Capitol itself to the east and the Mall and the Washington Monument to the west. Visitors would be able to reach the Capitol Reflecting Pool and the tourmobile interchange on its east side via crosswalks at Pennsylvania and Maryland Avenues. Bollards along Ceremonial Drive would guide visitors to the crosswalks.

Opposite this portion of the Mall, 14th Street currently slashes on a constant downward grade from Independence Avenue to Constitution Avenue, wholly denying the broad flat plane of the Grand Axis and creating a barrier to pedestrians as they approach the Washington Monument. The 1966 Mall Master Plan called for tunnelling 14th and 15th Streets under the Mall, and creating a larger visitor facility beneath an elevated formal belvedere that would overlook the Washington Monument grounds. Due to grading requirements, this tunnel would begin in front of the Bureau of Printing and Engraving and reemerge at Constitution Avenue. Such



NORTH-SOUTH SECTION THROUGH 14th STREET



EAST-WEST SECTION THROUGH 14th AND 15th STREETS

a massive construction program, including relocation of heavy utility lines, could not be implemented in any case by 1976. Nevertheless, relatively minor proposals could be put into effect by the Bicentennial that would significantly alter the undesirable features of the 14th Street Mall crossing.

It is recommended that the pitch of 14th Street be slightly modified between Jefferson and Madison Drives to respect the plane of the Mall. The slight increase in the slope of the street between Jefferson and Adams Drives and between Washington and Madison Drives would not hinder the flow of traffic within the District of Columbia speed limits. The construction would not require relocation of a major Pepco line under the street.

Crossings for pedestrians (and tourmobiles) at either end of the proposed flat portion of 14th Street would be surfaced in a modular paving. The combined effect of the levelling of pitch, the appearance of the crosswalk, and the characteristic sound of a modular pavement would serve notice to motor vehicles that they are entering a pedestrian zone. In almost every ordinary encounter between vehicular traffic and pedestrians, the pedestrian must defer to the vehicle. It is highly appropriate that the situation be reversed on the Mall, which has the potential of becoming one of the greatest urban pedestrian parks in the world.

The area between 14th and 15th Streets is a natural gathering area for visitors headed for the Washington Monument. It is also

the location of a major tourmobile interchange. It is proposed that the small earth berm between the two streets be removed both to permit pedestrians to move freely and to respect the Mall Grand Axis, which should be carried on an uninterrupted plane all the way to the foot of the Washington Monument hill.

Tree groupings incorporating as many existing trees as possible would be planted on both sides of the area between 14th and 15th Streets as extensions of the tree panels along the major axis. The trees would conceal loading lanes for the tourmobiles. Certain tourist services--including ticket sales and general information, comfort stations, and an outdoor food concession--would be placed in openings at the centers of the tree bosks.

Fifteenth Street, another major traffic artery, currently meanders across the Mall at the base of the Monument hill. A slight horizontal realignment of this street is recommended to make the street symmetrical about the Mall axis. Its curve at the foot of the rounded Washington Monument hill would recall the curve of Ceremonial Drive. The pavement of the pedestrian crossings on 15th Street would be treated similarly to the 14th Street crossings in order to achieve the same effect.

It is recommended for both practical and aesthetic reasons that a one-story building on 15th Street presently used by concessionaires be removed. The building is

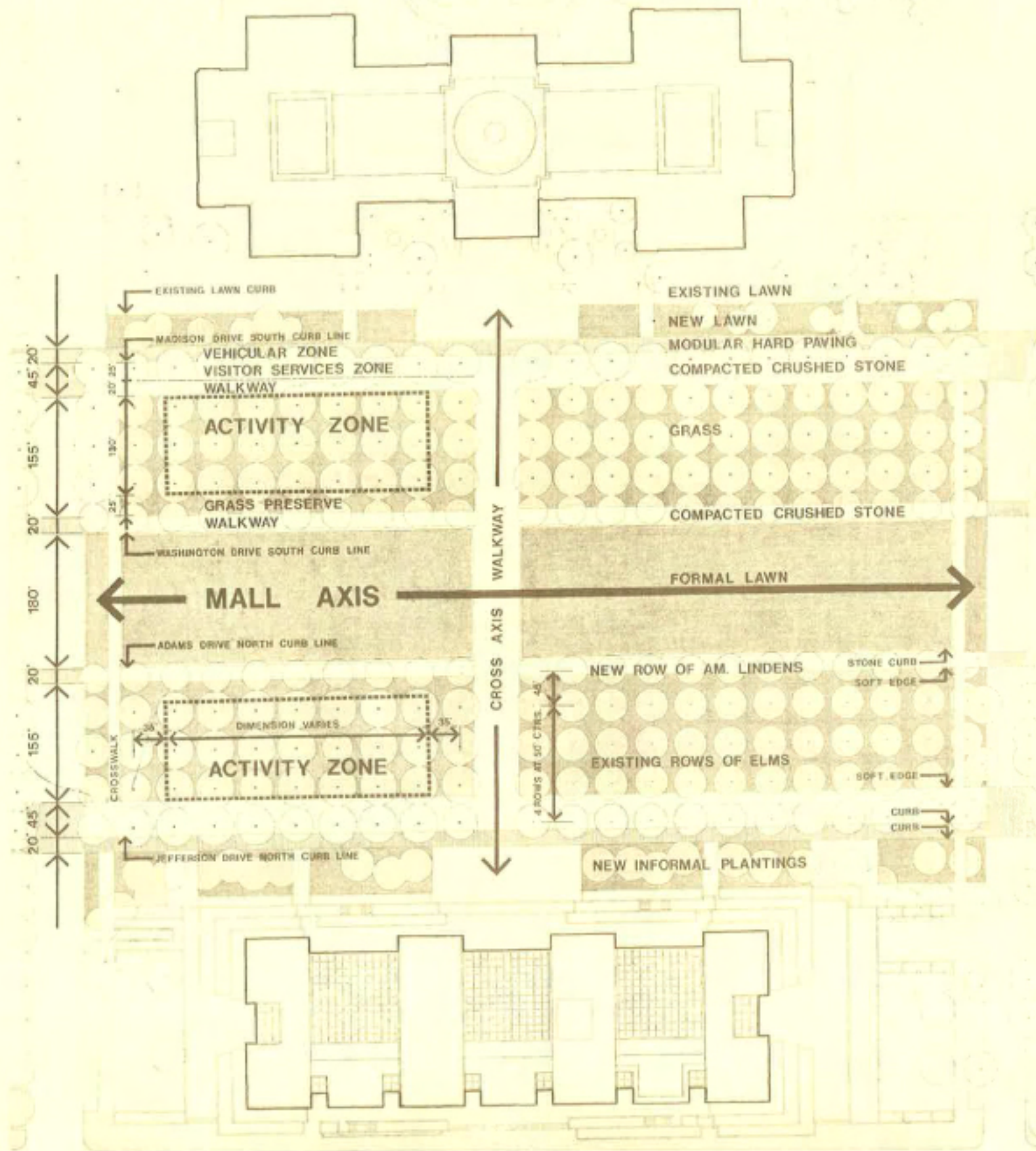
totally undistinguished from an architectural point of view and is an obtrusive presence on the Mall grounds, as it is located almost directly on the Capitol-Monument axis and obstructs the view of the Monument from the proposed pedestrian plaza between 14th and 15th Streets. The visitor services provided within the building would be available at several nearby locations in 1976.

From the standpoint of overall Mall design, the area between 14th and 15th Streets is an important transitional zone between the more formal axis to the east and the pastoral landscape of the Washington Monument grounds. The proposed landscaping design for this area is intended to articulate the transition. The edges of the tree groupings facing inward across the center panel area and east toward the Capitol would be strong and thus more formal. This tree edge would become random and informal as it moved into the Washington Monument grounds. Pathways leading to the Monument would curve gracefully up the sides of the hill.

It is strongly recommended that visitors ascend the Washington Monument hill on foot, not in tourmobiles, in keeping with the importance of their pilgrimage to the memorial to one of the nation's most revered leaders. Because it is felt that direct ascent would be too abrupt and out of keeping with the terrain, proposed pathways leading to the Monument would curve obliquely up the sides of the hill. Bollards along 15th Street would guide visitors to the beginnings of the two symmetrically placed

paths. Informal groupings of trees lower in scale than those in the tree panels of the Mall axis would afford intermittent views of the Monument base as visitors begin the walk up the paths. As the curves in the paths would bring the Monument into full view, it would appear suddenly larger and more impressive than the view from the previous vantage point in the 14th-15th Street plaza.

The drawings in this report do not indicate any development of the yet to be designed new underground visitor facility planned for the base of the Monument. Paths that presently traverse the grounds west of the Monument are recommended for removal and replacement with two paths curving symmetrically from the summit of the hill westward to Constitution and Independence Avenues. Restraint is recommended for the adding of plant material to this part of the Mall. As strolling visitors wear the grass it would be renovated as part of a regular maintenance program.



THE WASHINGTON MALL

1976 PLAN ANALYSIS

PREPARED FOR THE NATIONAL PARK SERVICE,
DEPARTMENT OF THE INTERIOR, UNITED STATES OF AMERICA
BY SKIDMORE, OWINGS & MERRILL. OCTOBER, 1973

VEHICULAR ZONE
VEHICLES
BICYCLES
SERVICE VEHICLES
EMERGENCY VEHICLES
POLICE SCOOTERS

VISITOR SERVICES ZONE
DEPOSITION/SALES STANDS
SIGNAGE
TOUCHABLE TREE TRUNKS
DISKING PLATFORMS
BICYCLE RACKS
TRAIN BARRIERS

ACTIVITY ZONE
TEMPORARY DISPLAYS
KIOSKS
RESTROOMS

1976 Plan Analysis

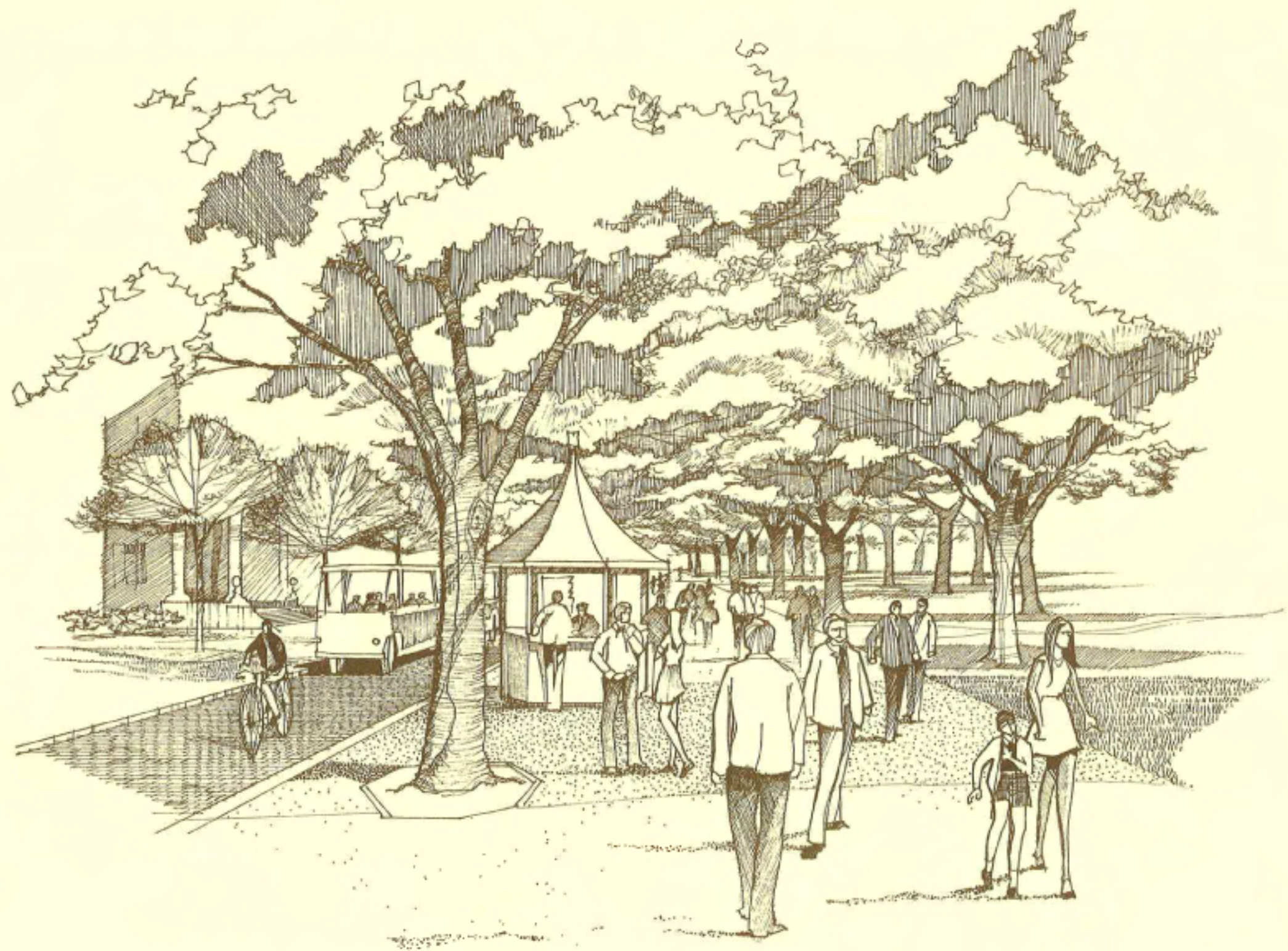
Within the area between the Mall museums and galleries from the Capitol to the Washington Monument, the design of the proposed development can be analyzed in terms of several continuous functional zones. These zones would be symmetrical about the Mall axis. The several zones and the character of the landscape on which they occur are represented in the drawing titled 1976 Plan Analysis, which shows a typical partial plan across the Mall. Comparative cross section views of the Mall are provided by two drawings, 1973 Cross Mall Section at 5th Street and Proposed Cross Mall Section at 5th Street. The following descriptions will refer specifically to the part of the Mall north of the axis. The southern portion would be a mirror image.

Landscaping decisions for the area immediately in front of the buildings are now and will continue to be made by the respective museums and galleries in coordination with the National Park Service. For the most part the present landscaping on the building "front lawns" has been carefully considered. The plantings in front of the National Gallery, for example, are particularly successful. It is recommended that this level of quality be maintained and that additional plantings be used to screen potentially unsightly elements such as service driveways and ventilation shafts from the view of Mall visitors. Consideration should be given to placing cut flowers in this area, particularly near the building entrances.

Extension of these "front lawns" is proposed between their present limit and the new tourmobile roadway. The new land would be reclaimed from a portion of the ground on which Madison Drive and its adjacent sidewalk (Jefferson Drive on the south) are presently located. The successful plantings on the existing lawn should set a standard for additional landscaping, which again would be the responsibility of the Mall institutions in concert with the National Park Service. In general it is recommended that the trees in this area should be less grand in scale and character than the plantings on the street sides of the museums or the elms in the Mall tree panels. Appropriate trees might include flowering species such as dogwoods, cherries, and magnolias.

The vehicular zone for tourmobiles, bicycles, and service and emergency vehicles would be a 20 foot wide roadway surfaced in a hard, modular material such as clay ("brick") or stone pavers. Considerably narrower than Jefferson and Madison Drives (which are 35 feet wide), the new roadway would allow sufficient room for comfortable and safe passage by bicycles and tourmobiles. In the event of a mechanical failure, tourmobiles and emergency and service vehicles would be able to pass one another.

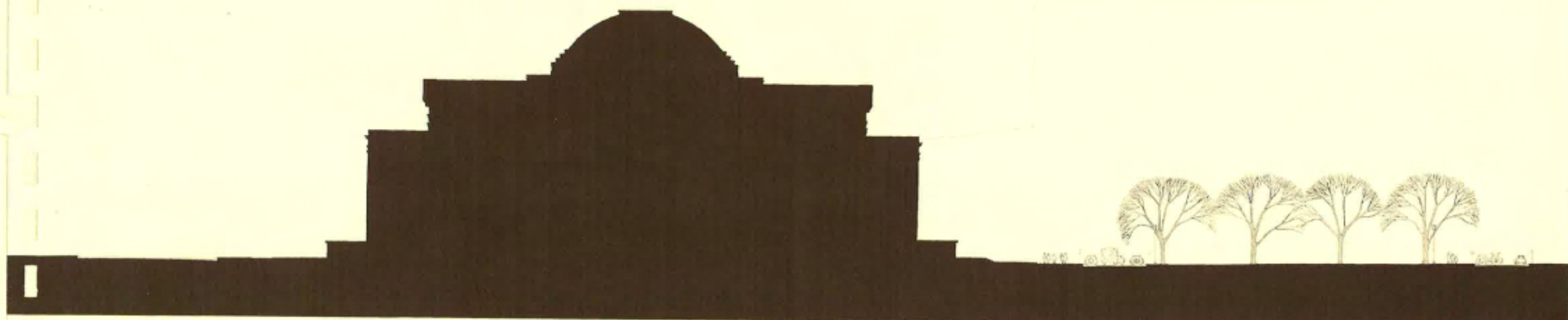
The modular surface is recommended to create a human scale and temper the roadway's linear character. Where the major vehicular streets are crossed at grade (4th, 7th, 14th and 15th Streets), the tourmobile roadway surface would be extended across the asphalt. These



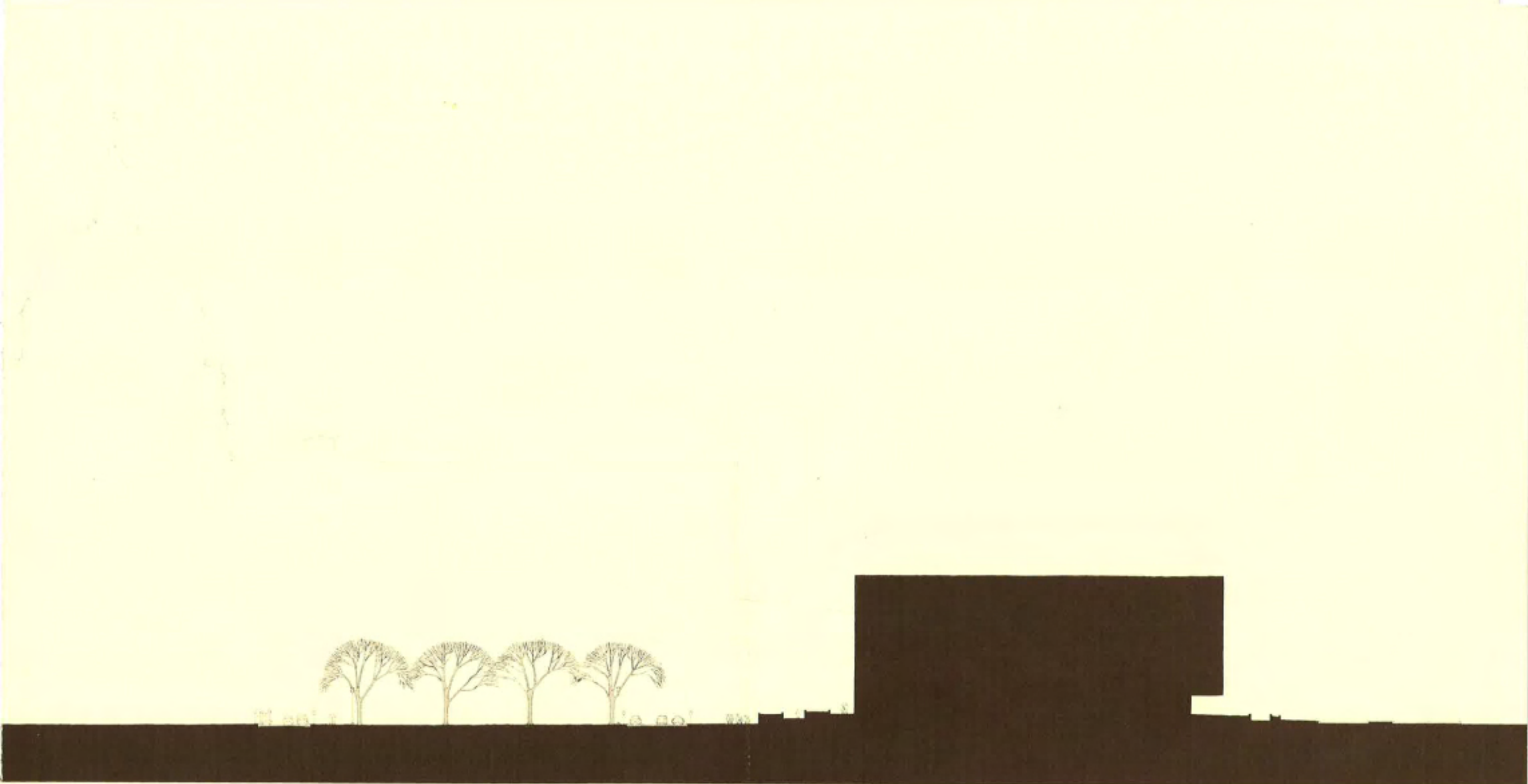
THE WASHINGTON MALL

1973 CROSS MALL SECTION AT 5TH STREET

PREPARED FOR THE NATIONAL PARK SERVICE,
DEPARTMENT OF THE INTERIOR, UNITED STATES OF AMERICA
BY JERRY WALKER, OFFICE & ASSOCIATES, INC. OCTOBER, 1972



AREA	WALKWAY SPAN	WALKWAY SPAN	MALL	WALKWAY SPAN	WALKWAY SPAN
100	10	10	100	10	10



EAST-WEST LINE OF WALL WINDING DRIVE DRIVE JEFFERSON DRIVE DRIVE DRIVE

100' 50' 10' 50' 50' 50' 50'



BASE-WEST END OF WALL

CURB

WALK

SMALL PLANTING

ACTIVITY ZONE

WALKWAY

VEGETATION

TOURNOISE

LAWN

100'

20'

25'

100'

20'

25'

20'

100'

crossings would be further controlled by traffic signals, as they are presently.

The roadway would hold to the existing south curb line of Madison Drive. (The corresponding roadway on the south half of the Mall will hold to the north curb line of Jefferson Drive.) This feature would permit the new surface to be placed directly on the existing street with minimal regrading and subsurface work. Existing storm sewers therefore could be used, with modifications to catch basins.

A broad pedestrian allée next to the tourmobile/bike roadway would extend 45 feet under the elm plantations. The outer 25 feet of this path would be zoned for visitor services. Shaded by the outer row of trees in the elm panels, these services would include kiosks, similar in design to the existing structures, for information and sale of tourmobile tickets and photographic film; bicycle racks; benches; drinking fountains; and trash containers.

The design of repetitive units such as benches, drinking fountains, and trash containers should be of the highest quality in keeping with the significance and beauty of the Mall. It is recommended that the National Park Service submit the design of all such street furnishings to the best industrial and graphics designers in the country and require concessionaires to adopt the resulting designs, subsequent to the appropriate reviews.

The inner 20 feet of the allée would be

reserved for pedestrian movement. The path is located in the optimal position for convenient access to both the museum buildings and the Mall grounds. The walk between museums and down the Mall would be cooler and more pleasant under the canopy than the corresponding route is today along sidewalks in the open sun. Pedestrians on the new allée would walk beneath the arch where branches from the two outermost tree rows meet. Conveniently placed crosswalks would lead over the tourmobile/bike roadways to the building entrances. Accommodations would be provided for wheel chairs and to allow access for bicyclists to the bike racks and benches along the allée.

The path would be surfaced in compacted crushed stone, the texture of which is relatively softer and better suited to the pedestrian than the paving of the tourmobile/bike roadway. A 4 inch agricultural drain tile would be set in the lower rock layer of this path to perform the double function of drainage (to avoid surface puddles and mud) and ventilation of the ground underneath, which would assure a supply of oxygen to the tree roots. (Depending upon the extent of oxygen deprivation, a tree may be seriously damaged or killed. Elm trees, whose roots grow perilously close to the surface, are especially vulnerable.) The outer row of trees, which would emerge through the path approximately 10 feet from the tourmobile/bike roadway (Madison and Jefferson Drives at present), would be protected by a wood platform of 2 inch by 4 inch planks mounted

on wood piers (Figure 5). The path would be carried across the major vehicular arteries on an extension of the tourmobile/bike crossing.

The area under the elms next to the pedestrian allée would be used for activities that are temporary in duration and do not involve heavy intensity of use. Such activities, some of them keyed to museum and gallery functions, would include exhibitions, informal concerts, and various kinds of performances including programs interpreting aspects of the nation's history. Extreme care must be taken to select activities that are in character with the dignity of this part of the Mall and to locate these activities so the root structure of the trees would not be harmed. Compaction of the earth by human feet (and animal hooves and vehicular wheels) robs tree roots of the vital oxygen supply. It is recommended that the National Park Service and the museums and galleries make certain that proposals for activities are subjected to the appropriate processes of review. Further study should be undertaken to determine more precisely the levels of intensity, type, scope, and duration of uses that should be permitted within the activity zone.

Sites for activities should be relatively small. No single activity or combination of activities should dominate the tree panel; at any one time at least 60 percent of this area should be unoccupied except by strolling visitors. Wherever possible,

activities should occur in open spaces in the plantation where trees have died or are missing for other reasons. Alternately, they could be located in a space that meanders around several trees, but this approach would potentially endanger a greater number of trees. The removal of dying trees would be permitted to provide space for an activity.

After the site is selected, the soil should be renovated (Figure 1) with a spiked roller to loosen the earth and promote aeration. Samples of the soil should be tested in National Park Service laboratories to determine whether and which nutrients should be introduced at this time.

A range of protective surfaces could be placed on the ground to cushion the impact of human feet and other weights. The most flexible and easiest to use surface is wood chips. A 2 to 3 inch layer of wood chips on a 1 inch layer of peat moss (Figure 2) affords adequate protection for relatively non-intensive, short-term activities. A wood chips surface can be used by itself or in combination with other more rigid (and more protective) surfaces.

A harder surfacing is recommended for the more intensive activities of longer duration. The best surface in terms of affording protection to the tree roots is the wood platform. These platforms would be mounted on wood piers driven into the earth so as not to cut major tree roots. The longevity of the timber platform is limited by natural

factors of weathering and wear and would determine the length of time an activity mounted on such a platform can endure. Precast concrete slabs laid on crushed rock sieved to 1 1/2 to 2 inches form a longer-lasting protective surface. If a precast platform is to remain longer than three months, its construction should be preceded by complete renovation of the ground underneath and installation of an air ventilation system to feed oxygen to the earth (Figure 4). Although the platform itself can endure longer, it should be dismantled at the end of one year in order to assure protection of the roots.

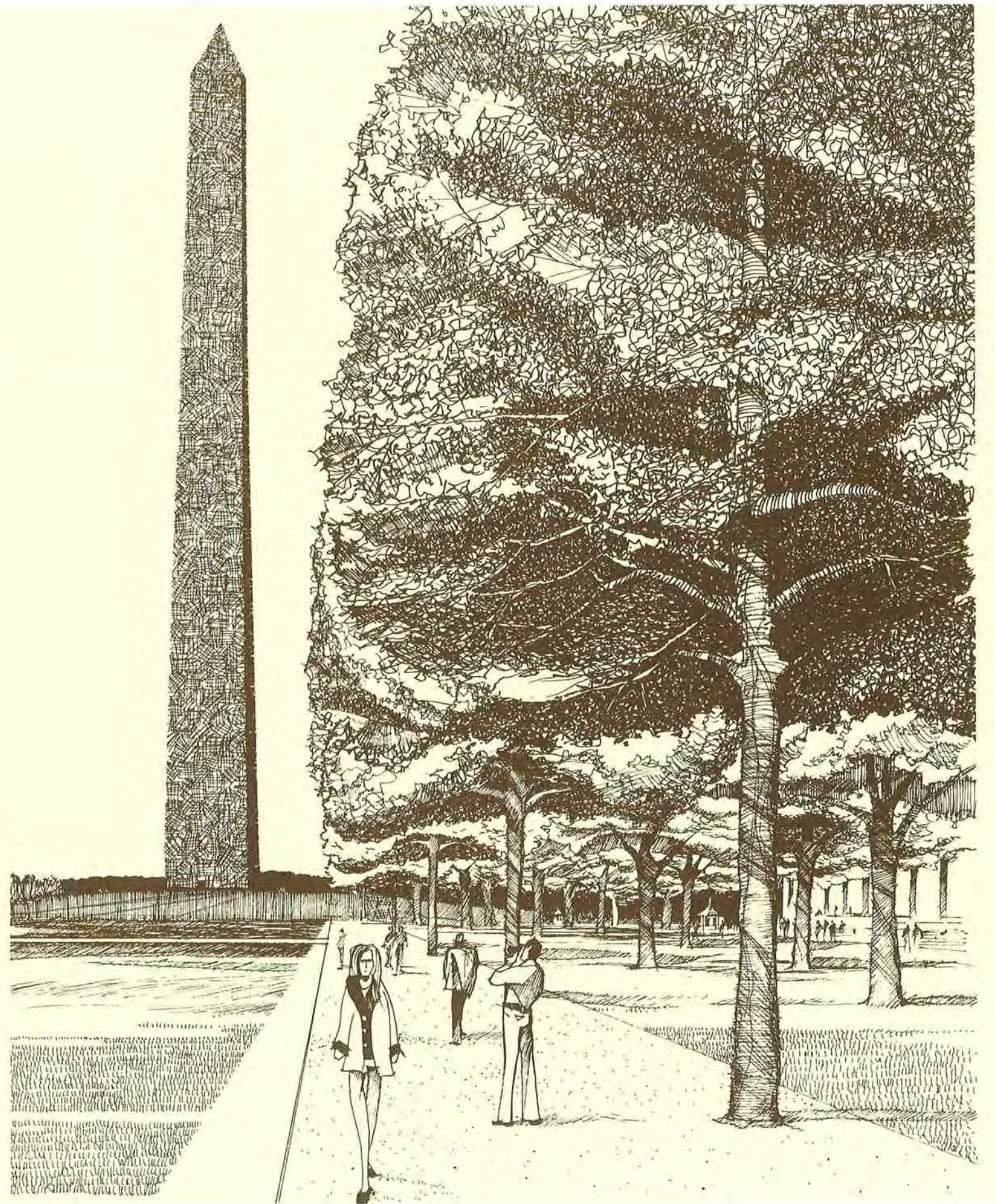
The activity locations would not necessarily be immediately adjacent to the pedestrian allée, and they would never be coterminous with other pedestrian paths. A 25 foot strip of grass would be reserved as a buffer between the edge of the activity zone and the inner pedestrian paths. A similar buffer zone would be adjacent to the cross-Mall walkways. The free-floating condition may require protection of the transitional area where the various routes of access converge toward the activity. Wood chips are well suited to this function (Figure 3). The flexibility of their use makes it possible to take remedial action if, after the beginning of an activity, the area of secondary impact proves broader or differently shaped than expected.

Even when wood chips are used, the focussing of foot traffic toward an activity is likely to wear the adjacent unprotected grass. Sim-

ilarly, the grass is likely to be worn over time from the more or less random walking of visitors under the elms. However, the grass under the trees is not first quality grass--which cannot grow under conditions of constant shade--and it will never present a perfectly groomed appearance. Therefore it is recommended that the worn areas be reseeded (or resodded) as necessary as part of normal maintenance operations. Similarly, at the conclusion of an activity the area under the protective surface would be reseeded (or resodded).

Provision of electricity, water, and other utilities as needed for the activity would be provided by temporary lines tapping into a new utility core that would be built in conjunction with the tourmobile/bike roadway. Stubs would be spaced at regular intervals, and the required services would be carried from a stub to the activity in a shallow trench positioned so as not to injure the tree roots. When the activity ends, the utility spur line would be removed and the trench refilled.

A 20 foot wide pedestrian path would be placed next to the buffer zone and within the south curb line of Washington Drive. (The corresponding path on the south side of the Mall would hold the north curb line of Adams Drive.) The pedestrian's experience on this inner path would differ considerably from the walk along the outer allée. The latter passage takes place under a leafy arbor formed by trees on both sides. In contrast, a new row of



trees recommended for planting in the inner walk 5 feet from the buffer zone would have the appearance of a grand colonade. Gracefully shaped limbs would arch protectively over the pedestrian from the "wall" of the colonade as he would enjoy an unobstructed view across and down the broad Mall greensward.

The recommendation for planting an additional row of trees on either side of the Mall center panel is responsive to two concerns. The removal of the east-west drives would change the proportional relationships between the tree panels and the greensward as they appear now from several vantage points. These proportions have won public acceptance and official approval (as countenanced by the designation of the Mall as a national historic landmark), and it is recommended that they should not be altered substantially. The other consideration, equally important, is of a practical nature. The elm trees on the Mall are susceptible to Dutch elm disease, and the National Park Service has been struggling to combat the fungus there since 1947. Many of the trees in the Mall plantations have died over the past twenty-five years, and a future attrition rate of 1 1/2 to 2 percent each year is expected. Gaps in the panels due to missing

trees have the potential to destroy the purpose of the plantations as envisioned in the original L'Enfant Plan and more recently by the McMillan Plan. A plan for major development on the Mall would be shortsighted if it did not recognize the problems connected with elm tree losses and propose solutions.²

The elm plantations serve a two-fold purpose. They provide a shaded environment for visitors that contrasts dramatically with the open greensward. Perhaps more importantly, the tree panels provide the edges that define the shape of the Mall center panel.

This formal design, with its clearly delineated boundaries between the component elements, was inspired by such eighteenth century landscape architecture as the Versailles gardens. The design of the Mall has evolved in such a way that the classical French approach has been somewhat muted by more naturalistic elements of nineteenth century English landscape architecture. The elm trees, for example, have softer and more varying forms than the pleached and rigidly symmetrical trees of the classical European manner. In spite of this agreeable modification of the classic structure, the design of this part of the Mall is sufficiently formal to require a

²Between June 7 and August 10, 1973, 372 elm trees in the District of Columbia were diagnosed by the National Park Service to have Dutch elm disease. This year additional inspection teams have been dispatched beyond these regularly scheduled because the Dutch elm disease problem is so widespread. Failure to address this problem squarely may ultimately result in the elimination of the tree panels on the Mall by the attrition of the elms altogether.

strong edge condition, as it is the major axis of the original L'Enfant plan.

The crucial elements in this regard are the inner rows of trees beside the greensward. Interruptions in these rows where trees are missing would--and does--destroy the linear quality of the design and cause this part of the Mall to resemble too strongly the pastoral landscape west of the Washington Monument. Much of the aesthetic pleasure of the Mall landscaping is derived from this very juxtaposition of the romantic pastoral landscape with the more formal garden, and the contrast should be preserved.

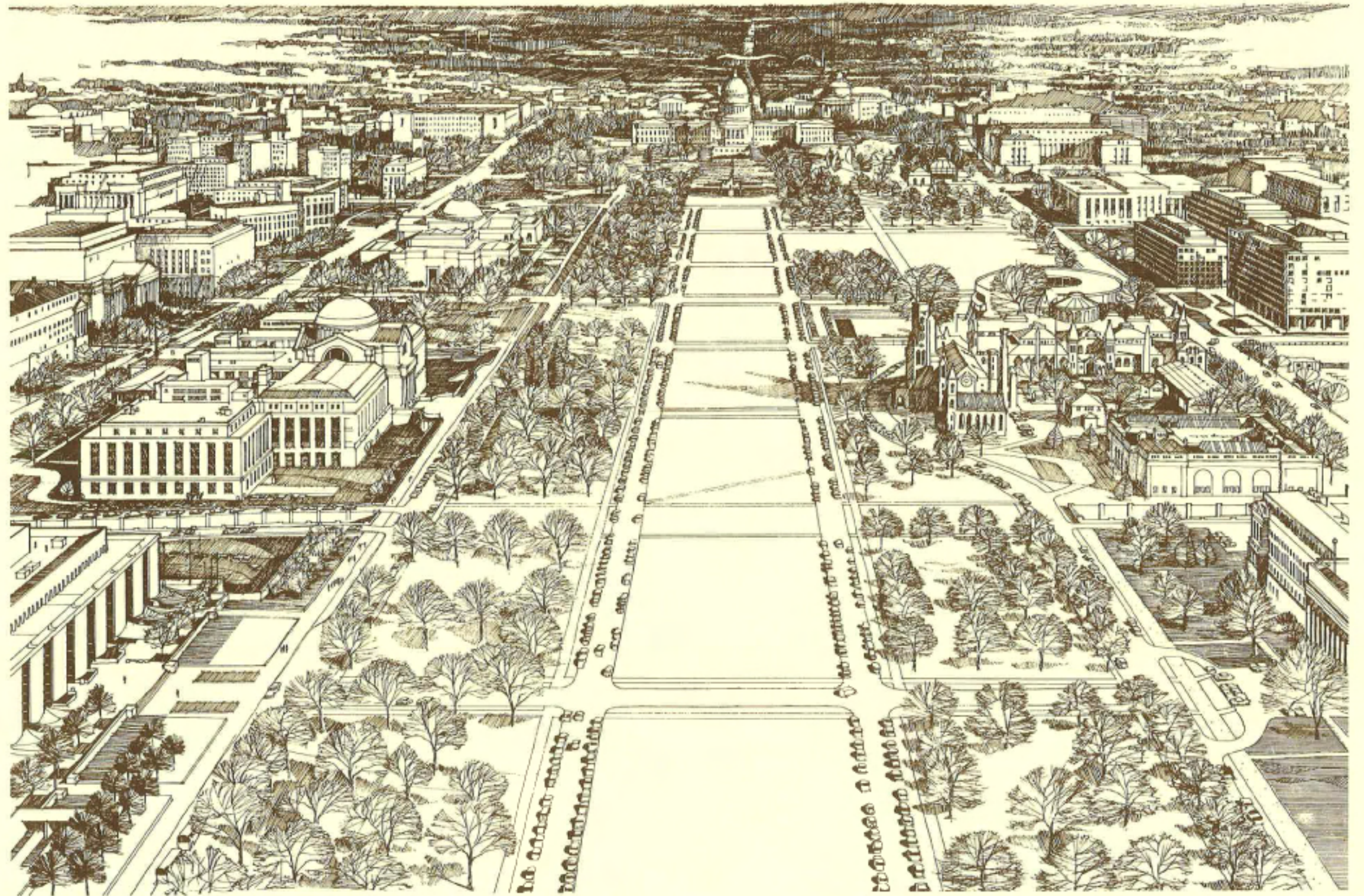
If no trees were missing from the inner rows, the integrity of the formal relationships between tree panels and the greensward would be preserved. These inner rows would perform the function of a fence, screening any gaps in the interior of the panels from the view of pedestrians walking along the greensward. Although these interior gaps might be noticed from elevated vantage points such as the Washington Monument, the Capitol grounds, and airplanes approaching Washington's National Airport, they would not be visually disturbing so long as the edge along the greensward was clearly defined. Definition of the center panel edge would not be critical to a visitor walking under the elms or along the building side of the Mall because from these areas the center panel itself is not axially visible.

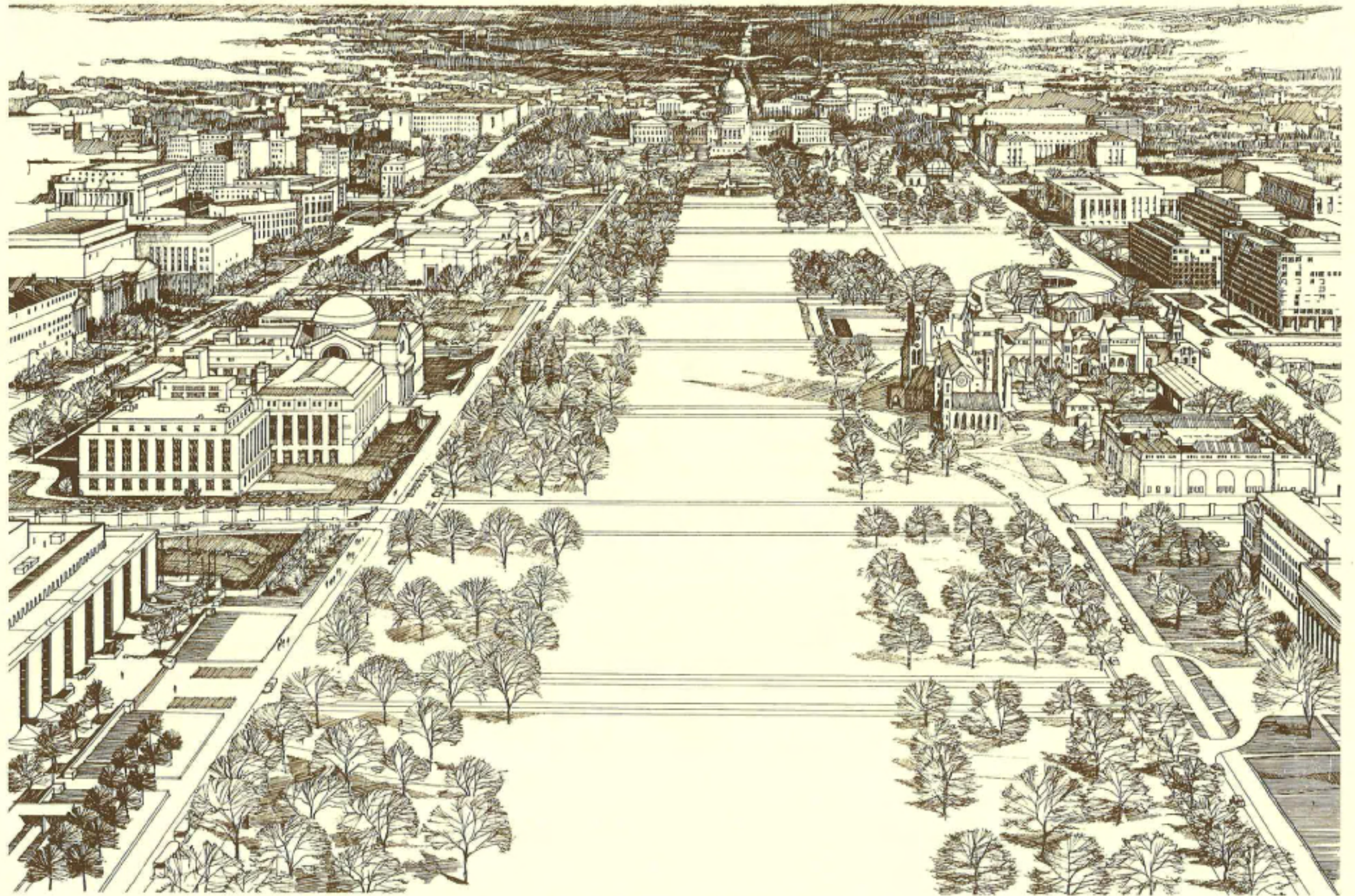
The rows facing the greensward have already

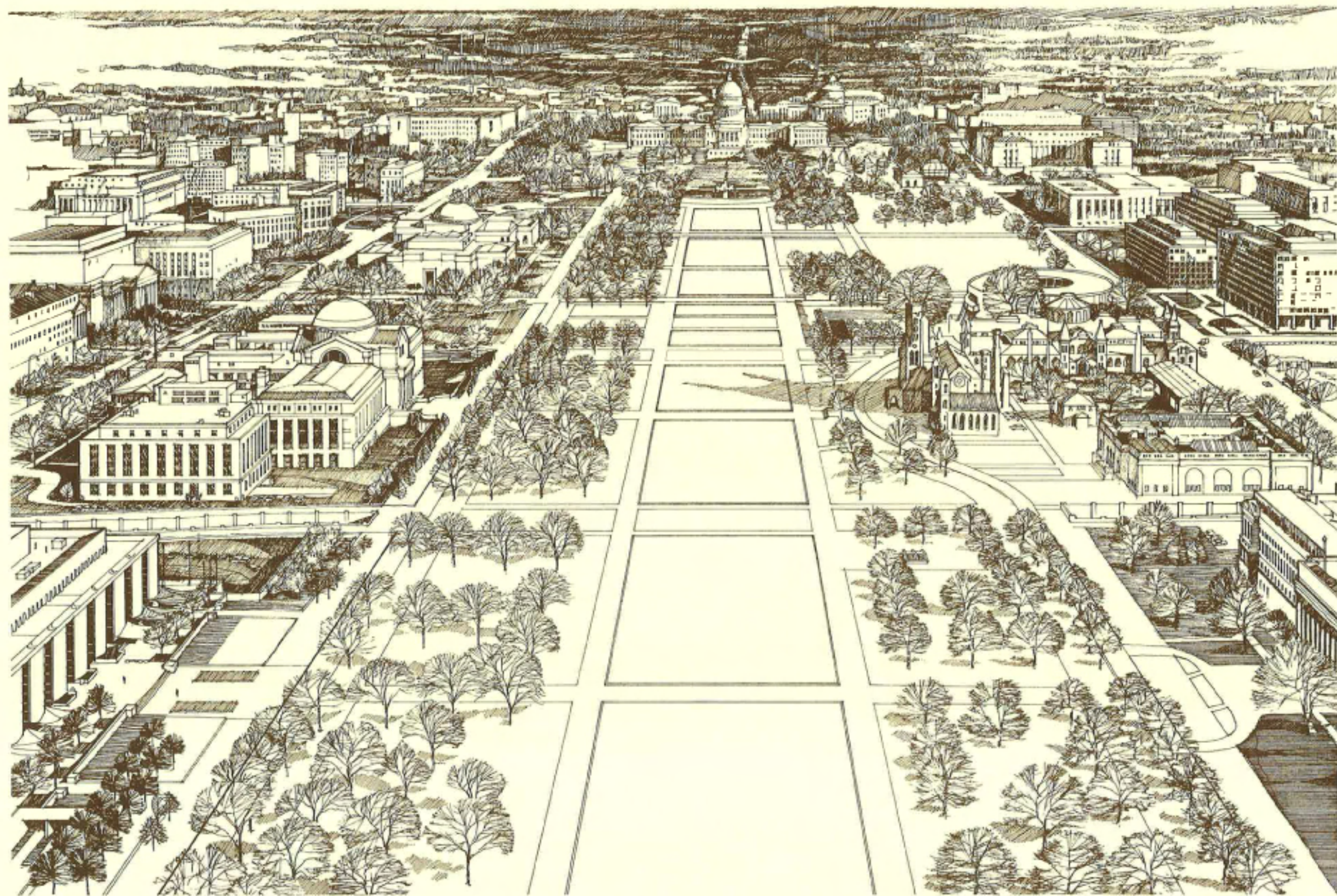
been seriously eroded by tree deaths due to Dutch elm disease and the removal of trees to make way for temporary structures erected during the two world wars and other construction. Of the more than 150 trees originally planted in these two rows in 1930 over 25 percent (39 trees) are missing. More than half the missing trees were felled by Dutch elm disease. Some trees have been planted in replacement, but many of these are substandard in other respects and are likely to die before reaching maturity.

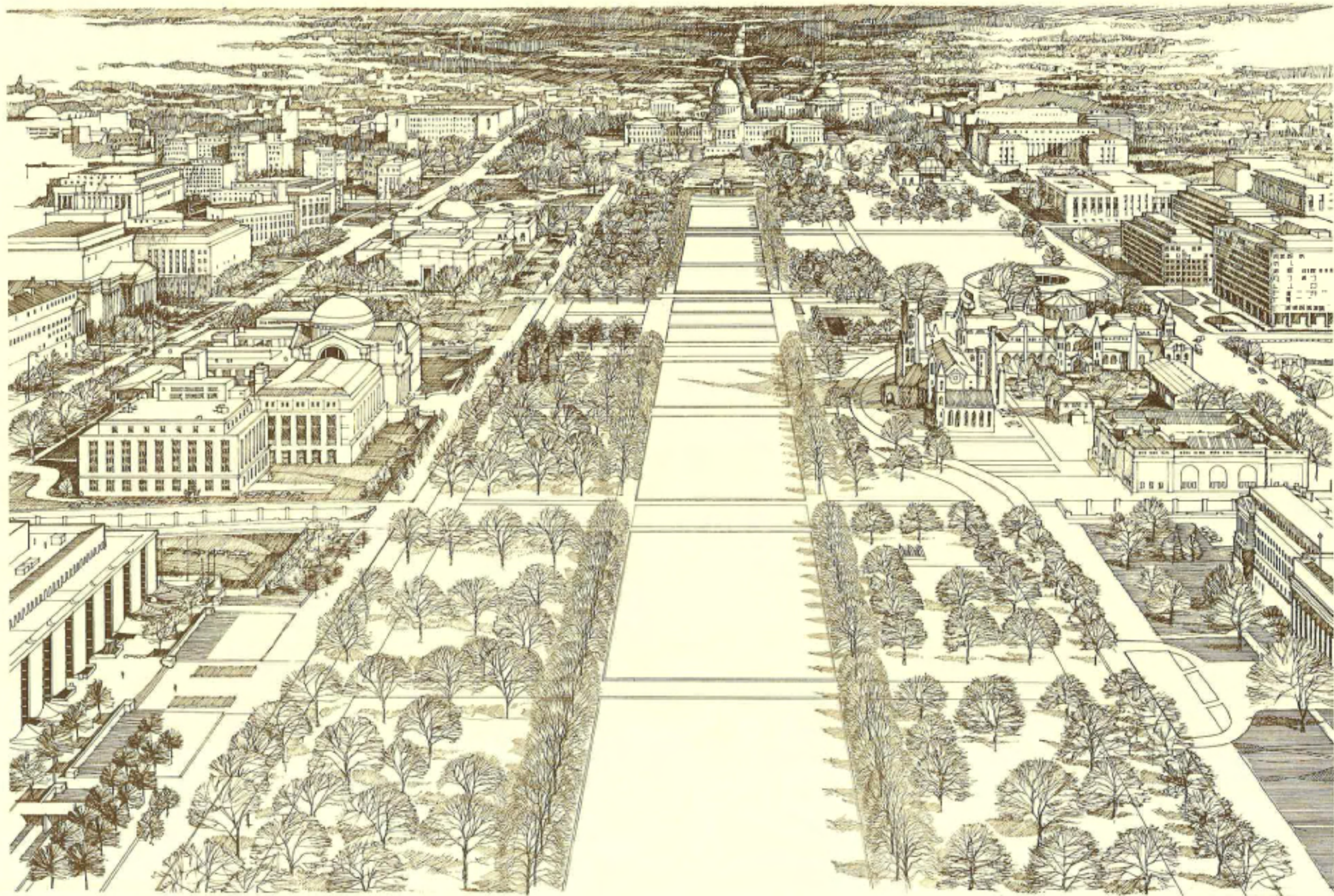
There are alternative solutions for maintaining a firm edge along the inner rows of trees. A disease-resistant strain of American elm could be used to replace the existing trees as they die. Although recent efforts toward breeding a disease-resistant American elm are promising, there can be no assurance that the currently favored strain, developed nine years ago by the National Park Service, will survive over the long run. Furthermore, even if this strain were to prove resistant, the edge along the greensward would be uneven as young, small trees continually were planted in the place of mature trees that succumb to the fungus.

The recommended solution is to plant an additional row of trees on either side of the grass panels at 50 foot east-west intervals in keeping with the grid of the tree panels. These trees, which would all be planted at one time and grow to the same height, would keep the edge of the greensward intact. Losses within the elm plantations due to Dutch elm disease could be replaced









as they occur without impairing the overall design of the Mall axis.

Aside from these functional considerations, the establishment of additional rows of trees is essential in order to maintain the proportional relationships between the Mall center panel and the flanking tree panels. A series of four perspective views were drawn to allow accurate comparisons among the alternatives. The drawings are based on a view of the Mall from the Washington Monument taken through a 55-millimeter camera lens--which closely approximates the cone of vision of the human eye.

The first drawing shows the Mall as it existed prior to the recent Metro construction and including the parked automobiles along the four east-west drives. A second view shows the Mall with the inner east-west drives removed, thus extending the width of the greensward. The center panel loses definition as the strong perspective lines formed by the parked automobiles and the streets disappear. This condition would be accentuated from a ground-level viewpoint.

The third drawing shows the proposed 1976 development without the additional inner rows of trees. The definition of the greensward is reinforced by a 3 foot wide stone curb (replacing the south curb of Washington Drive and the north curb of Adams Drive), but the edge condition that the trees should provide is still extremely ragged. The pathways are exposed in the sunlight and too far removed from the elm plantations.

The fourth drawing shows the proposed 1976 development, including the new inner rows of trees. The width of the lawn in this plan is exactly the same as it is at present (and in the first and third drawings). Here the stone curb recreates the perspective lines of the existing center panel, and the new trees reestablish the uniform inner edge--a central thesis of the McMillan Plan. Together these new elements actually serve to preserve the proportional relationships.

Another species of tree than elm is recommended for planting in the new row of trees. As has been mentioned previously, even the best of the new strains of elm may eventually succumb to Dutch elm fungus or prove to have other shortcomings. The Princeton clone elm in front of the new Air and Space Museum, for example, is to date resistant to Dutch elm disease; but it is susceptible to the round-head bore, and its trunk has a tendency to split upon reaching a 7 to 8 inch caliper. The most promising new strain of elm has been developed in a program of the National Park Service, whose plant pathology laboratory is one of the most sophisticated in the nation. Clone 3-178 has proved resistant to Dutch elm disease over a nine year period of observation. Although this tree, because of its experimental nature, is not suitable for planting in the new rows, the Park Service should continue and expand its policy of planting this and other resistant elm strains elsewhere in the tree panels where gaps have been created by missing trees. In this way the Mall could serve as a laboratory for the development of a healthy

American elm. The American elm is an attractive and valuable tree, and every effort should be made to use it in landscape design so the species does not disappear through disuse. By promoting these efforts on the Mall itself, the National Park Service would perform a valuable service.

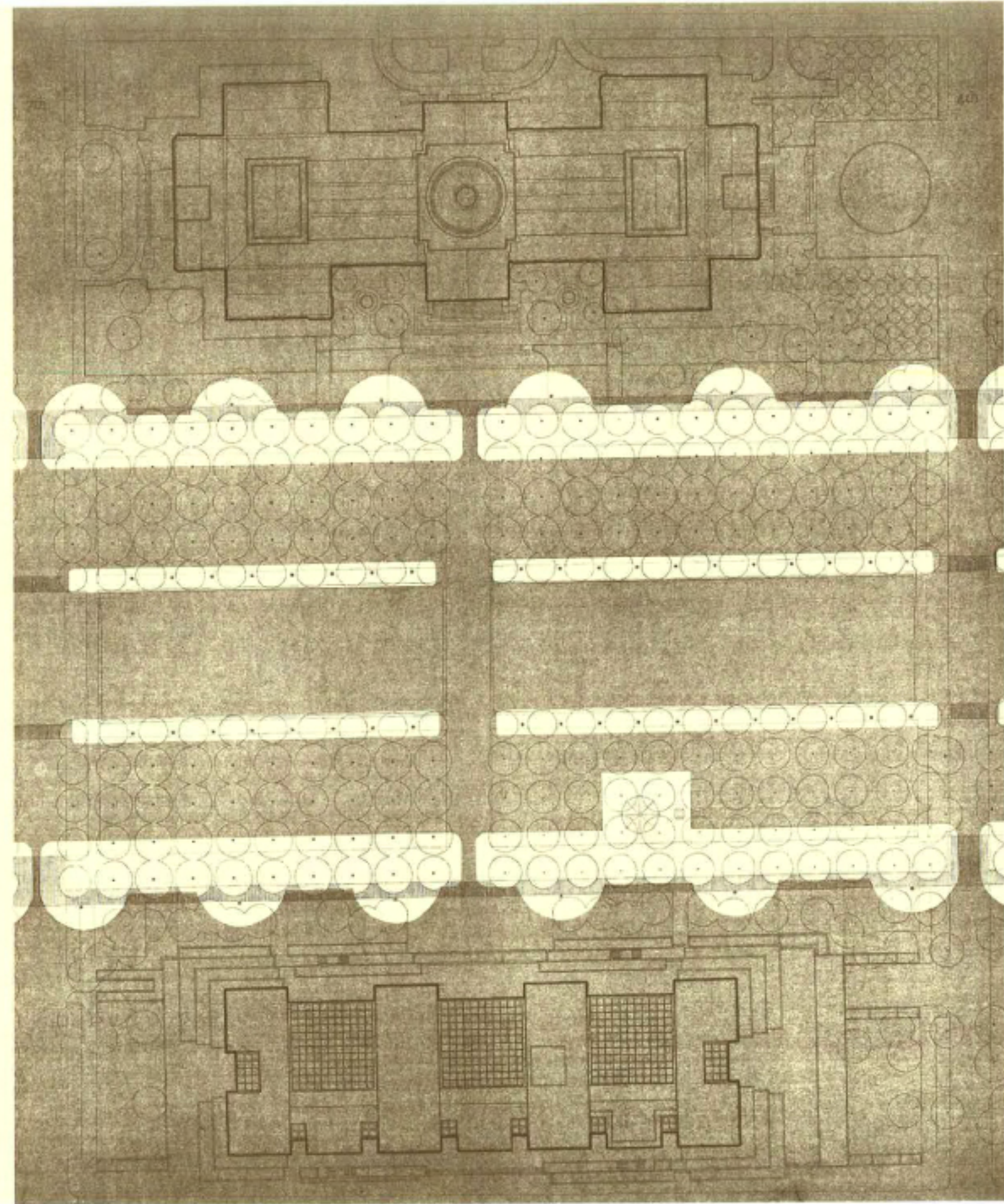
Introduction of a different species of tree would bring the benefits associated with breaking the monoculture on the Mall. According to ecological theory, monoculture is an unnatural and inherently unstable condition. Particularly on the Mall, with its highly fragile elm-centered ecosystem, the introduction of another species is to be welcomed.

The tree recommended for planting in the new tree rows is the American linden. This species is desirable because its characteristics are similar in many respects to those of the American elm. Viewed from the greensward, the procession of elms along the edge has a graceful bounding appearance. The rhythmic pattern thus established is one of the essentially American elements in the Mall axis design.

In describing the relative characteristics of the linden and the elm, a distinction must be made between the elms that grow on the Mall and the classic American elm. The classic elm will achieve a minimum height of at least 80 to 90 feet, often reaching well over 100 feet in suitable conditions. Although the linden may also grow to similar heights, the form of the two trees is very

different; and if they were the same height, they would nonetheless be out of scale with each other. Elms assume a mushroom-like shape with a broad untapered crown. The branching of the American linden is more bell-like, and the top of the crown is tapered. A mature classic elm would overpower the linden by virtue of this difference in the shape of the crowns. The elms of the Mall, however, can never be expected to reach the heights typical of their species. According to National Park Service plant pathologist Horace Wester, the elms planted on the Mall in the 1930s were seedlings. It is a recognized fact among nurserymen that clones--which are cuttings from the tops of superior specimens--are stronger and ultimately grow larger than seedlings. Mr. Wester, who has monitored the growth of the Mall elms since he joined the National Park Service in 1937, believes they will not reach much more than 10 feet over their present height of 40-50 feet. At this height, the two species will be compatible in scale. Figure 6 represents a diagrammatic comparison of the formal characteristics of the seedling American elm presently growing on the Mall, the classic American, the overcup oak, and the American linden.

Among the other trees given serious consideration for planting in the new rows was the overcup oak. This tree is well adapted to the Washington climate, and two beautiful specimens flank the entrance to the National Gallery. Its characteristics are well suited for the purpose at hand. Upon investigation, however, the tree has been proved unpopular



THE WASHINGTON MALL

LIGHTING PLAN DIAGRAM

PREPARED FOR THE NATIONAL PARK SERVICE,
DEPARTMENT OF THE INTERIOR, UNITED STATES OF AMERICA
BY SKIDMORE, OWINGS & MERRILL. 17 OCTOBER, 1973

THE WASHINGTON MALL

LIGHTING SECTION DIAGRAM

PREPARED FOR THE NATIONAL BAPTIST CONVENTION
DEPT. OF THE DISTRICT OF COLUMBIA
BY ARCHITECTURAL SERVICES, INC. WASHINGTON, D.C.



in nurseries. Perhaps because it has a tap root and is difficult to transplant, the overcup oak is not grown in sufficient quantity for planting 200 trees in two new rows on the Mall.

It is recommended that the trees planted on the new rows on the Mall be relatively large-- 5 inch caliper and approximately 20 feet high. They would begin to perform their design functions--screening the gaps in the rest of the tree panels and forming a colonnade beside pedestrians on the proposed walkway-- immediately after being planted. If trees this size are to be obtained in time for planting by 1976, action must be taken within the next three months or sooner, if possible, to order or pre-purchase them. A survey of the nation's biggest nurseries reveals that 200 5 inch caliper trees will not be available unless an order is placed soon and the existing specimens, which otherwise would be sold, are received and grown to the proper size.

Lighting

The development of a unified lighting design on the Mall would allow visitors to take advantage of the special beauties and opportunities for activities during evening hours. The focal points along the major Mall axes-- the Capitol, the Washington Monument, the Lincoln Memorial, the White House, and the Jefferson Memorial--are adequately lighted at present to provide sufficient nighttime definition for these basic structural lines. The primary aesthetic functions of the lighting between these focal points involve maintaining a sense of scale and defining the edges of the Mall. Within the portion of the Mall between Ceremonial Drive and the Washington Monument--the area of greatest emphasis of this report--the lighting systems would define the primary and secondary circulation route between the major museums and illuminate special activity areas under the elm plantations. (See drawings titled Lighting Plan Diagram and Lighting Section Diagram.)

The hardware recommended to provide this quality of light must be elegant but unobtrusive in keeping with the nature of the Mall design. The proposed incandescent light would be subdued and restrained in contrast with the harsh busy character of the lighting systems in surrounding downtown Washington.

The pedestrian allée and the tourmobile/bike roadway beside the Mall museums would be defined by a formal row of the handsome lighting standards presently used on the Mall

(Figure 7). These standards would be relocated from their various present positions to the boarding side of the tourmobile/bike roadway. If necessary, new standards would be crafted following the original drawings to permit their more frequent use at approximately 200 foot intervals. The optics of the standard would be modified to allow a cone of light to be cast across the tourmobile roadway at regular intervals while an upward directed stream of light would wash the outside row of trees.

Lighting along the pedestrian walkway would be augmented by small canisters suspended inconspicuously in the trees. The canisters are recommended in order to minimize the addition of new hardware along the allée. The incandescent light from these units would evenly illuminate the promenade in the manner of warm moonlight. The same lighting hardware would be extended into the tree zone to illuminate special activities where they occurred. The remaining area under the trees would not be lighted, thus allowing a pleasing interplay of light and shadow. Gentle ambient light from neighboring sources would pervade this area, making possible safe pedestrian movement. The contrast would be especially dramatic between the illuminated exhibit areas, whose colors would be picked up by the streams of light, and the changing tones of gray in the nearby areas under the trees.

The secondary pedestrian walkways next to the greensward would be lighted by bollards,

the design of which would be in keeping with their formal function and compatible with the old light standards along the allée. These bollards would be placed in line with and interspaced between the new rows of American linden trees. A funnel of light from the tops of the bollards would sidelight the face of the linden trees. Downward light would be directed along the stone curb next to the center panel, thus defining the Mall's perspective lines at night.

The existing light systems along the drives throughout the remainder of the Mall would be sufficient for nighttime travel by tourmobiles. Where additional lighting is necessary along other portions of the tourmobile route west of the Washington Monument, hardware would be selected that would be appropriate to these particular areas. The pedestrian pathways on the Washington Monument grounds and in West Potomac Park would require lower lighting levels and less frequent spacing of light sources in keeping with the informal character of these areas. Strolling visitors in these parts of the Mall would move between pools of light rather than along continually illuminated paths.

Concluding Remarks

The recommended design concepts for the 1976 development on the Mall reflect the fundamental concern that the visitor systems be flexible. The number of people who will visit the Mall in 1976 is essentially unknown. Estimates range widely from a 50 percent increase over present levels to two, three, even four times that figure. The fact that even the present levels cannot be measured accurately reflects the unreliability of the various predictions.

The proposals for visitor services--tourmobile routes; information, food, and sales facilities; and activities--were developed with full understanding that the number of prospective users cannot be known precisely. The proposed tourmobile circulation system could be expanded in a variety of ways. The number of kiosks for tourist information and sale of tourmobile tickets, film and other essentials within the appropriate zones would be determined by the demand. Activities appropriate to the zoned area under the tree panels in the east part of the main Mall axis and to the West Potomac Park area could be scheduled according to interest.

While they would provide flexibility, the proposed design concepts would not sacrifice the aesthetic integrity of the Mall to make room for an endless parade of visitors. The recommendations outline general criteria governing the nature and intensity of uses in particular areas of the Mall--criteria

that should be refined through additional study. If these limits are ignored, the quality of the visitor's experience would be diminished while the beauty of the Mall would be compromised.

The ability of the Mall to successfully accommodate Bicentennial visitors would rest largely on a comprehensive visitor education program. It is recommended that the National Park Service undertake such a program and that this program would begin in the home of the future visitor--with media advertisements and, perhaps, pamphlets distributed through local Junior Chambers of Commerce--and continue upon his arrival in Washington. The National Park Service's proposed shuttle bus between outlying parking lots and the Mall will work most efficiently if visitors know to go directly to a lot when they enter the city. The combination of a widespread advertising campaign and an effective signing system on the arteries leading into the city should make this possible.

Once they have arrived in Washington, visitors should have access to detailed information about the various points of interest in the city and on the Mall. City bus and Metro routes should be indicated in readily understandable fashion to encourage visitors to take public transportation directly to the Mall from local hotels and motels. When they arrive at entrance points to the Mall--such as the National Visitor Center--visitors should be oriented to the locations of food service and rest room facilities. Signs on the Mall grounds should tastefully convey

necessary information and assist in National Park Service interpretive efforts without being unnecessarily obtrusive by way of numbers or design.

Throughout this educational process the message should be conveyed to the visitor that his actions on the Mall must respect the beauty and dignity of this peerless park. The 1976 Development Plan reflects the conviction that its proposals, if implemented, would permit the greatest number of people to enjoy memorable visits to one of the most historically and culturally significant parks in the nation.

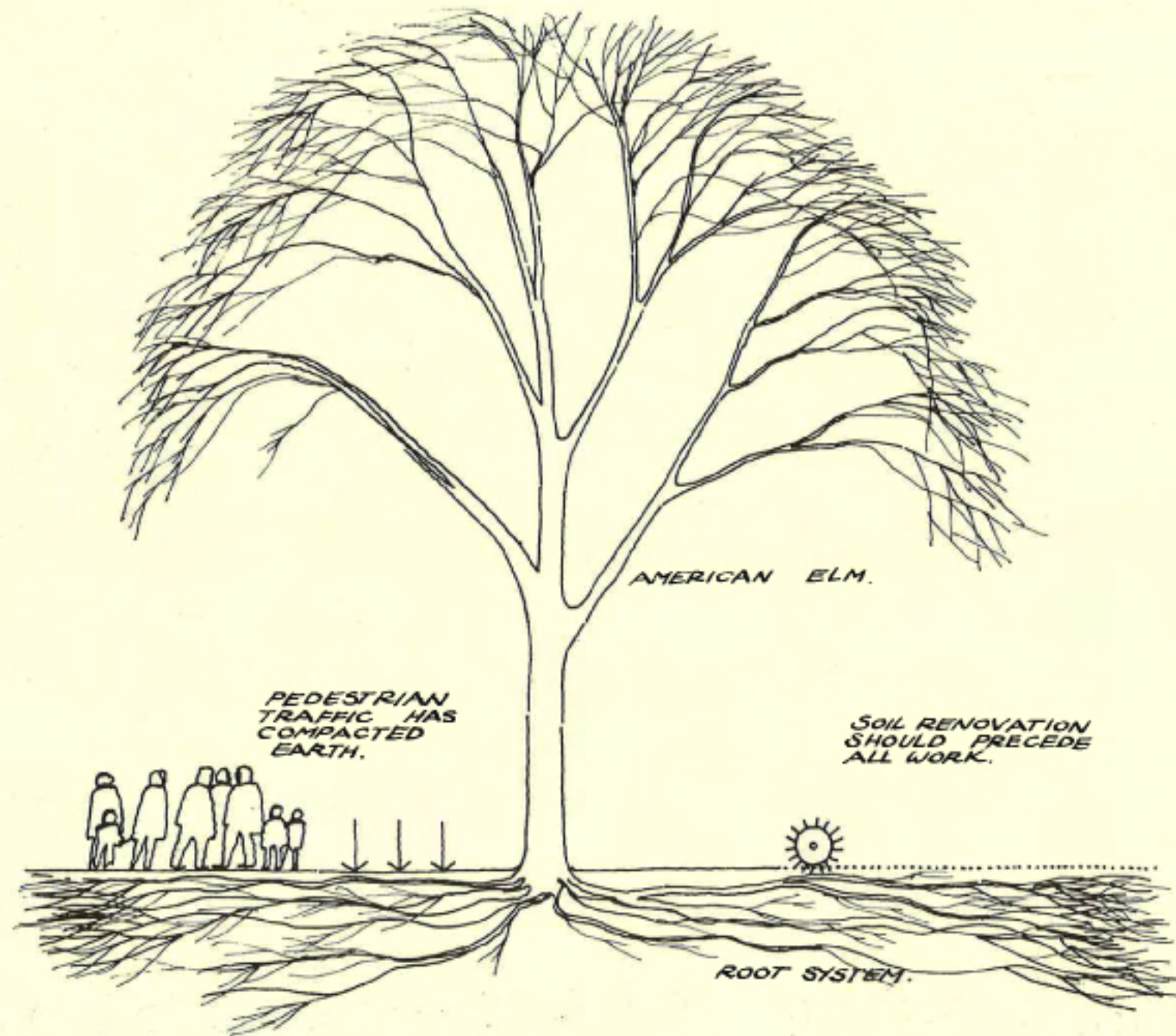


FIGURE 1

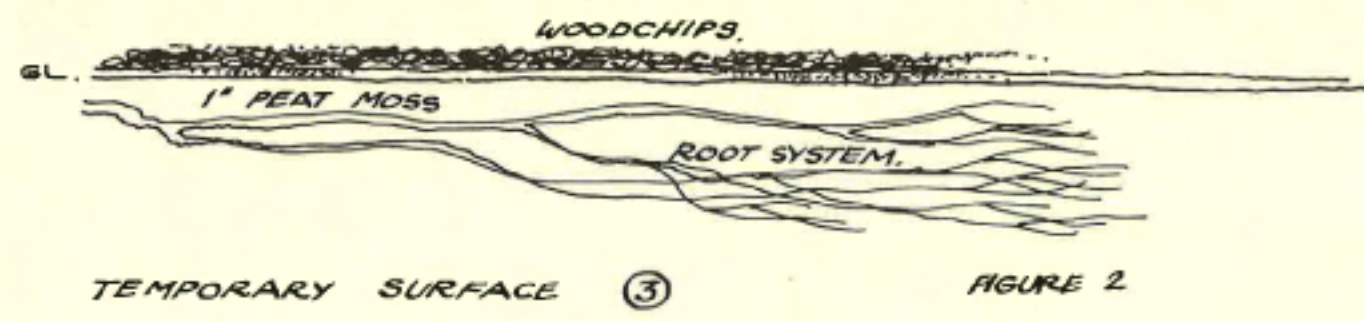
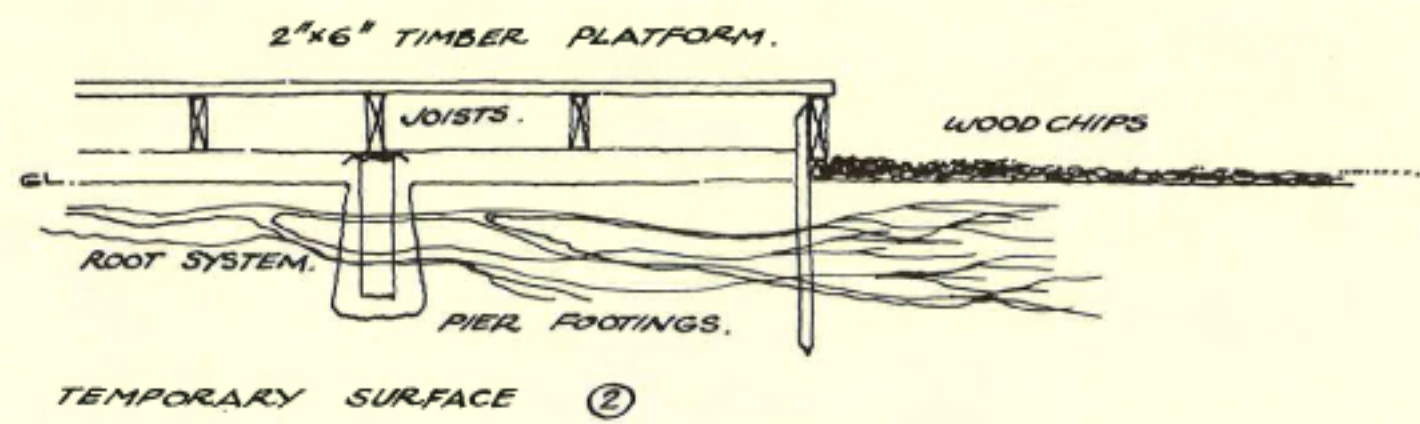
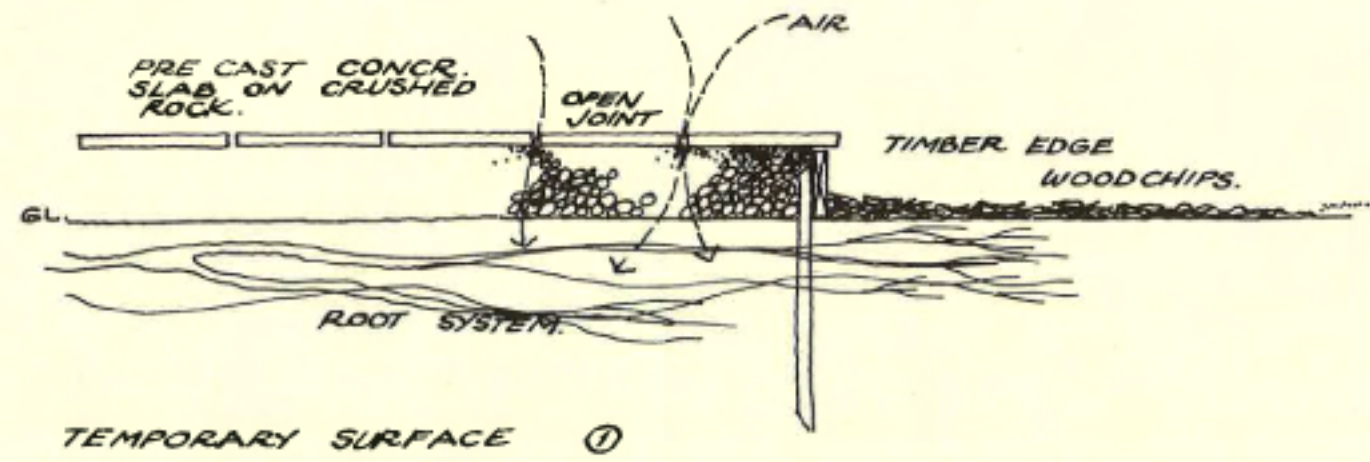


FIGURE 2

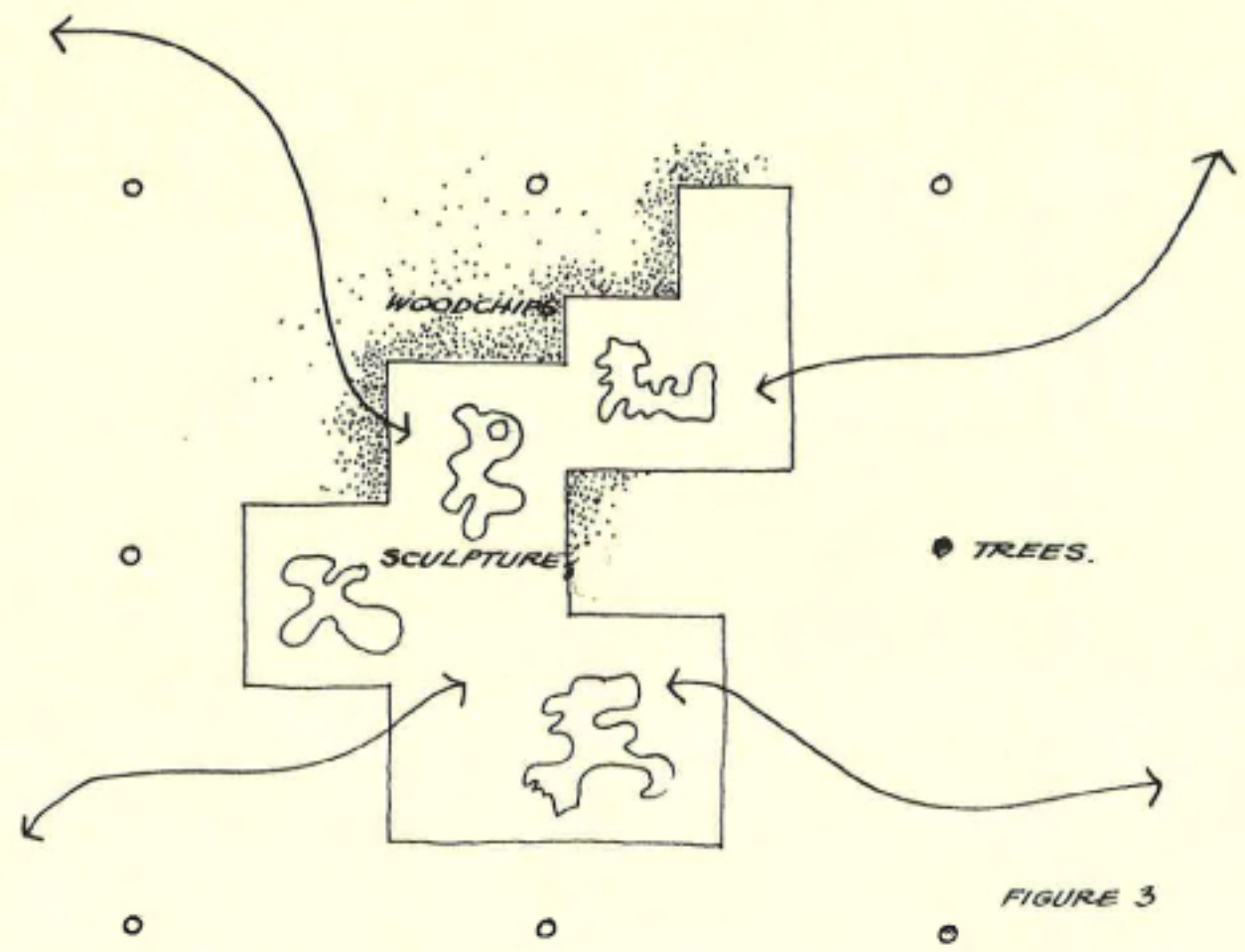
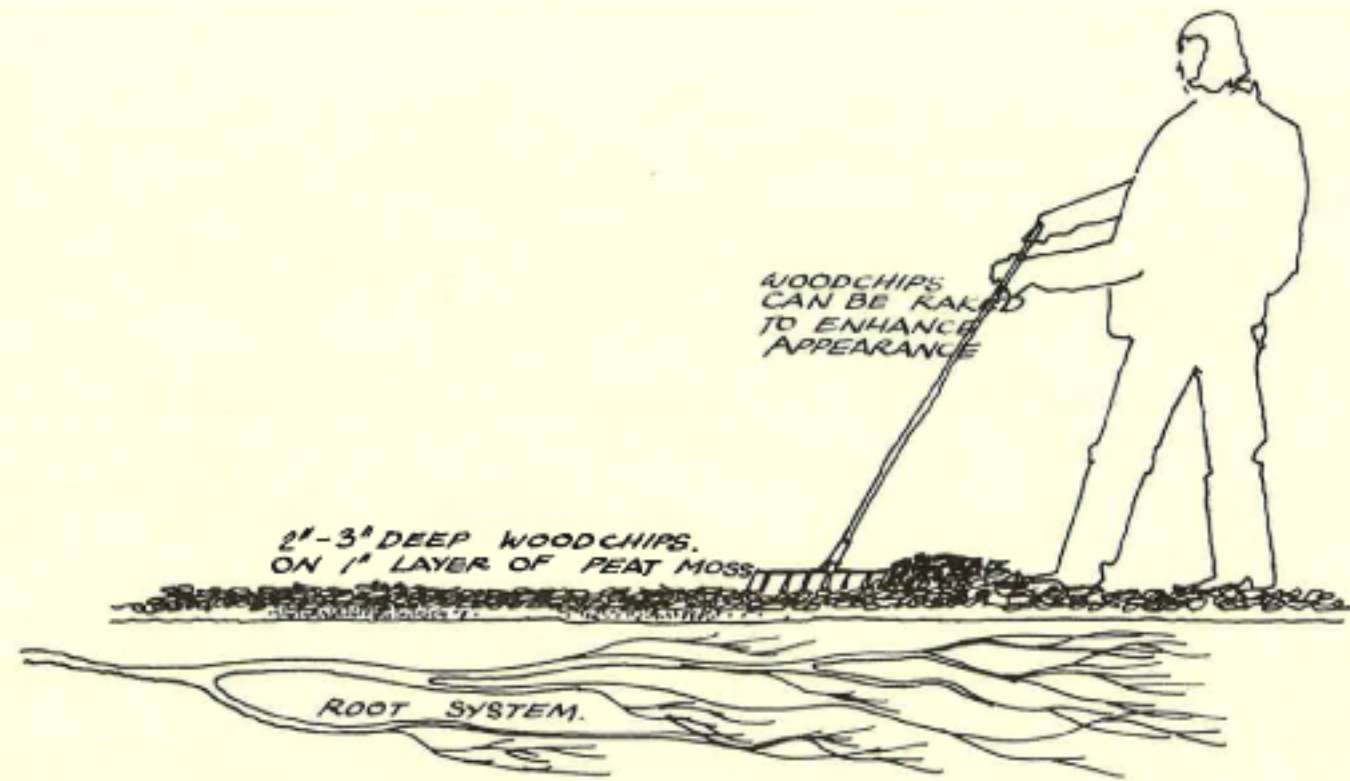
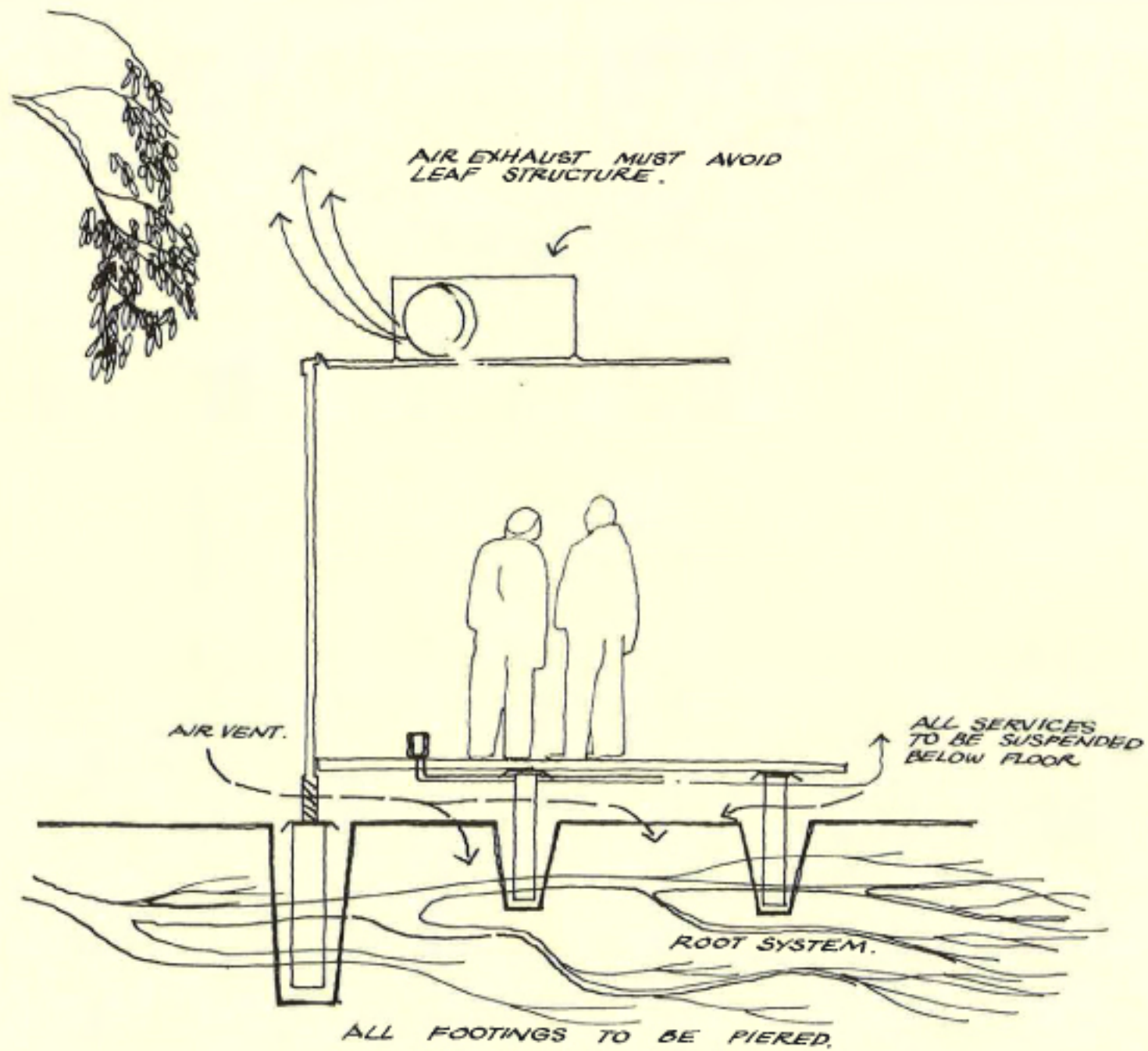


FIGURE 3



PERMANENT OR SEMI-PERMANENT STRUCTURES

* NO TRENCH CUTS WITHIN PERIMETER OF TREE CANOPY

FIGURE 4

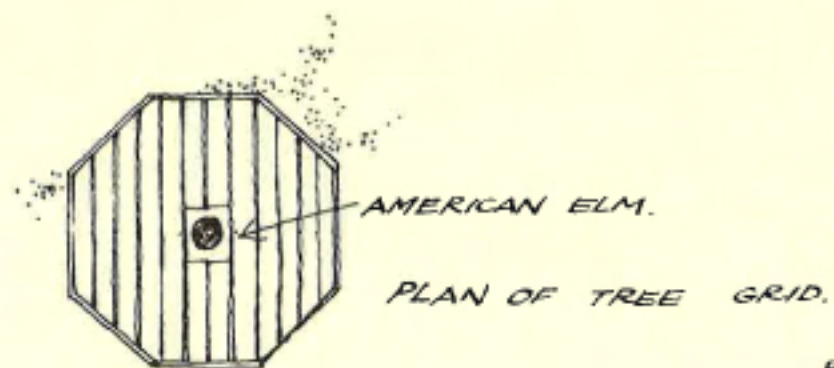
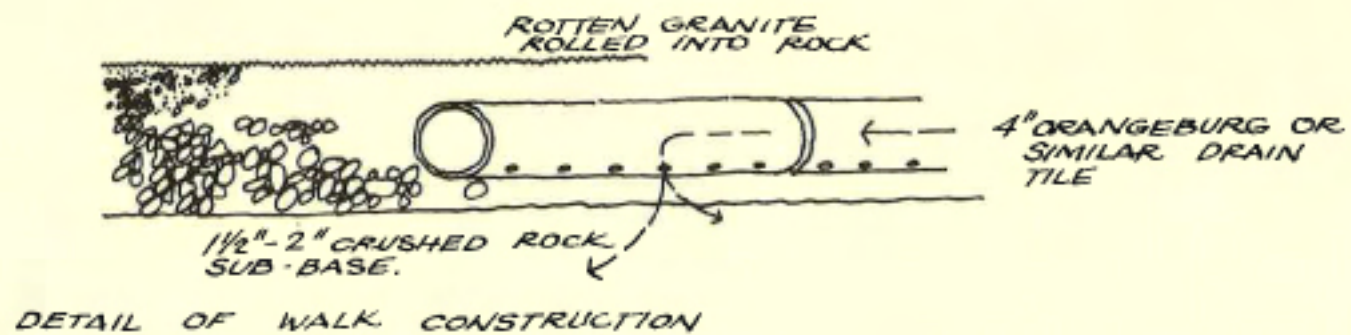
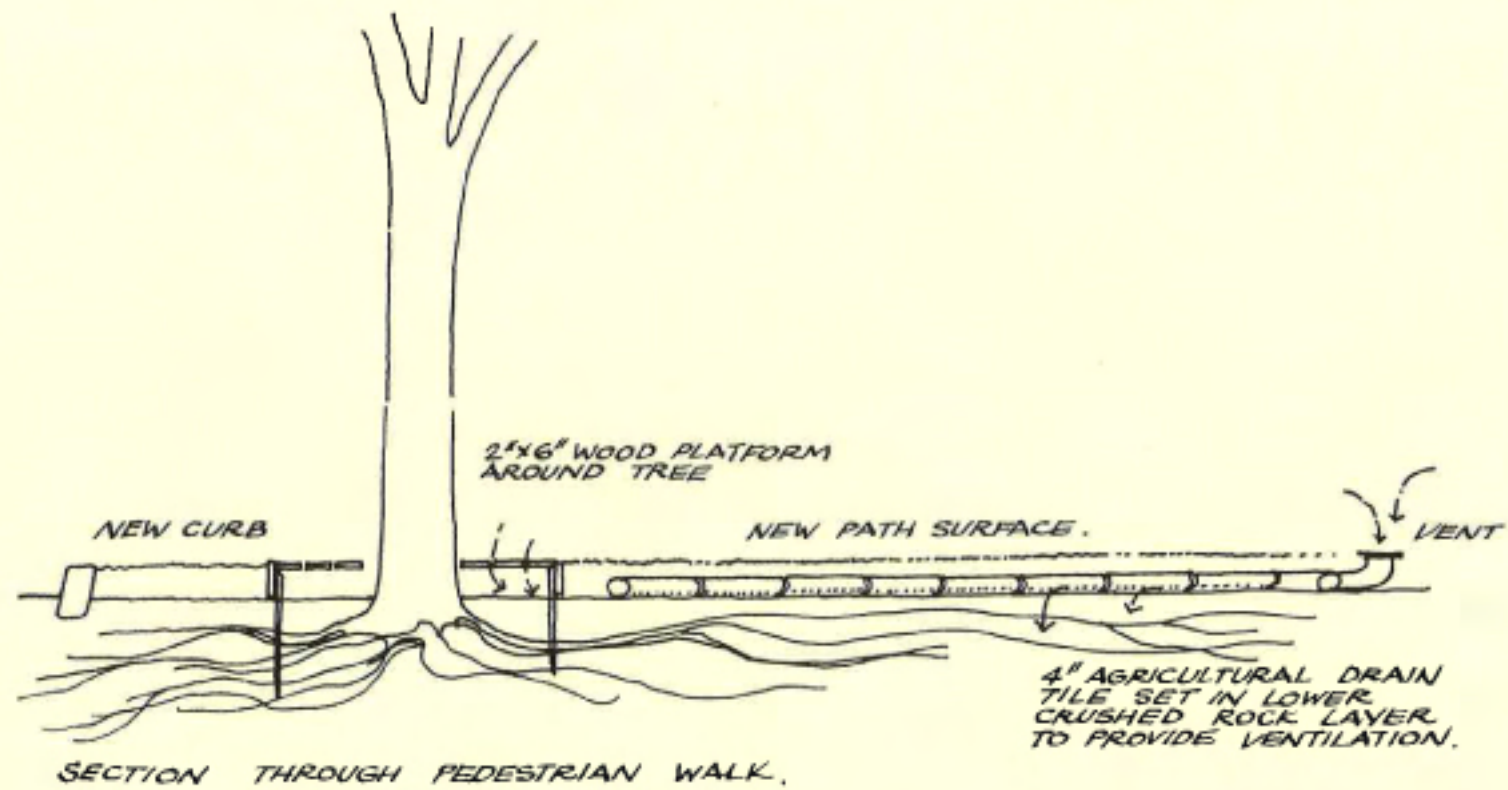
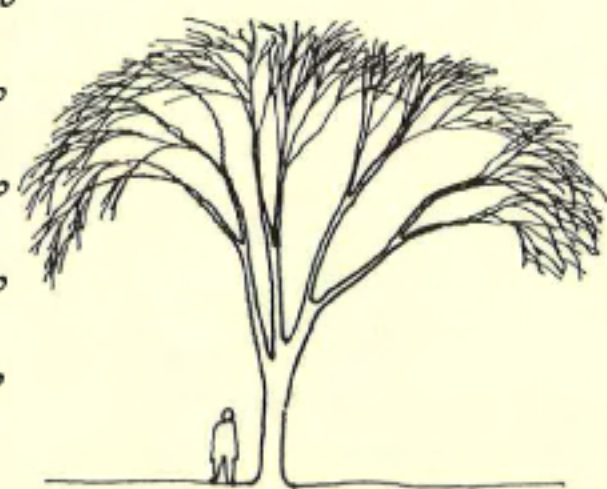


FIGURE 5

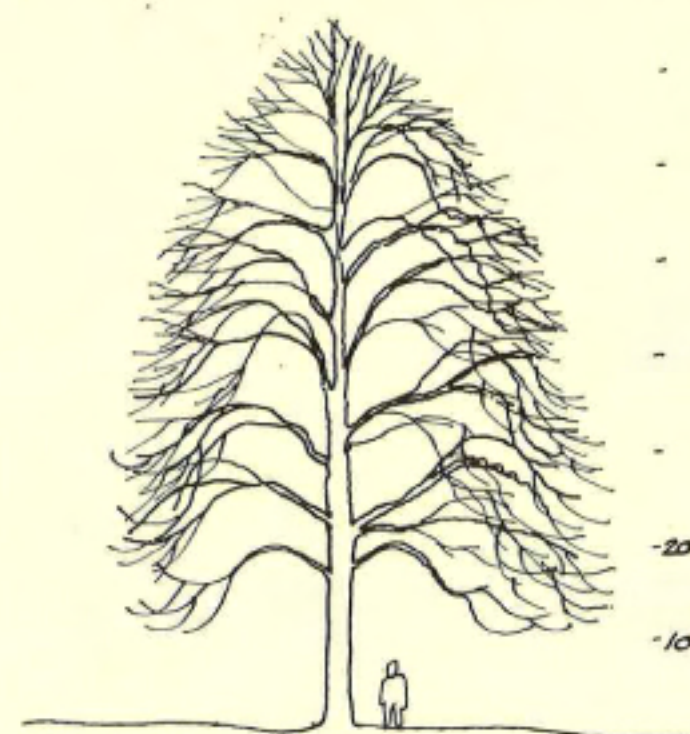


CLASSIC AMERICAN ELM.

50
40
30
20
10

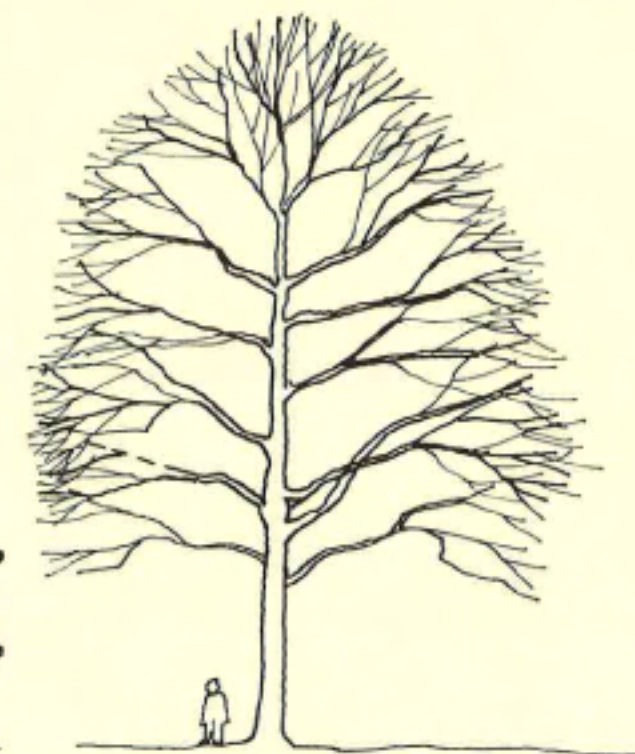


SEEDLING AMERICAN ELM.



AMERICAN LINDEN

20
10



OVERCUP OAK

FIGURE G

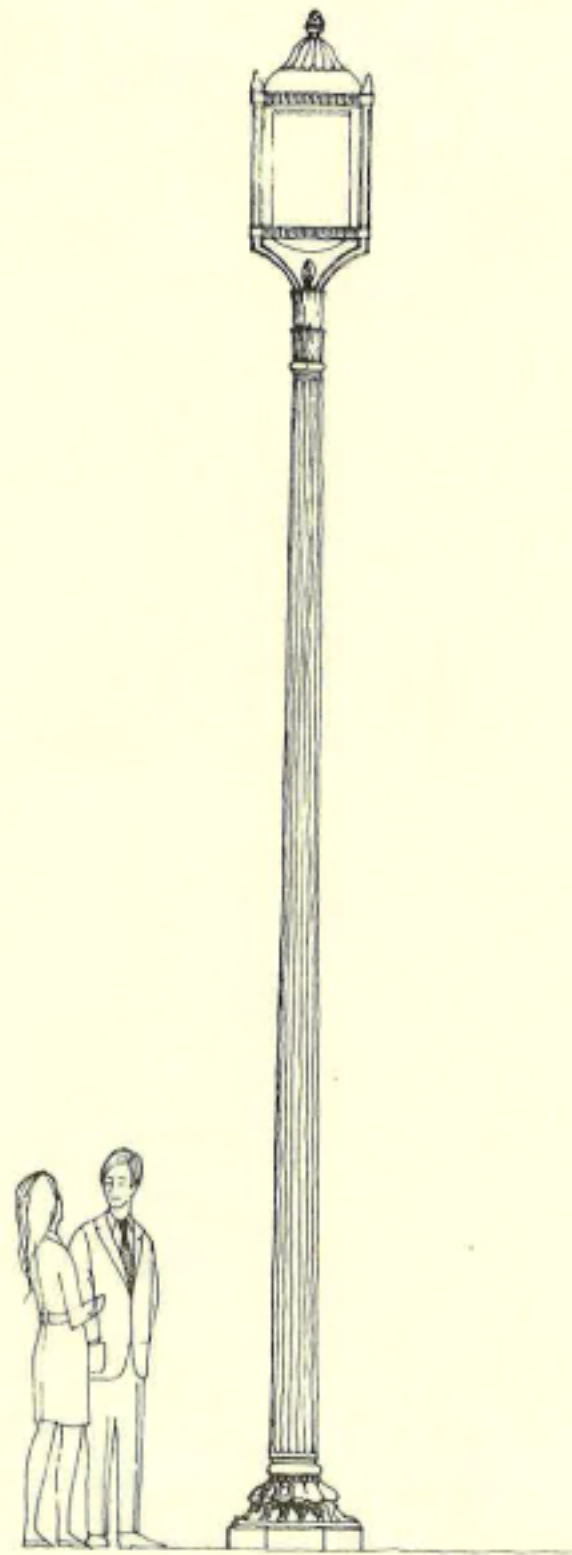


FIGURE 7.

1976 Development Plan: Description of Environmental Impact

1. Description of Proposal

The Washington Mall 1976 Development Plan recommends new tourmobile/bike roads and pedestrian systems to replace Madison, Washington, Adams, and Jefferson Drives. These parallel streets run the length of the Mall between 3rd and 14th Streets N.W. and are scheduled by the National Park Service to be removed in preparation for the 1976 Bicentennial celebration. Their replacement with pedestrian systems would render an additional three streets --6th, 10th and 13th Streets--inaccessible to vehicular traffic. The construction of Ceremonial Drive by 1976 would require the closing of 3rd Street between Madison and Jefferson Drives where it presently crosses the Mall and will permit the closing of 1st Street where it crosses the Capitol grounds.

The Development Plan proposes guidelines governing placement and construction of temporary activity areas within the tree panels flanking the Mall central panel east of the Washington Monument. Criteria are established for location of tourist information services, concession facilities, bike rentals, and comfort stations. Conceptual schemes are presented for landscaping and lighting arrangements associated with the circulation systems.

Most of the recommendations are directed to the area of the Mall east of the Washington Monument. If the proposal is

implemented, this area will sustain greater environmental impact than the section of the Mall west of the Washington Monument.

2. Description of the Mall Environment at the Present Time

A. Natural Environment

The Mall is an essentially flat, cruciform land area bounded along its east-west axis by the U.S. Capitol on the east, the Potomac River on the west, Constitution Avenue on the north, and Independence Avenue on the south; and on its north-south axis by the White House on the north, the Potomac River and the Tidal Basin on the south, and 14th and 17th Streets on the east and west. It is in close proximity to central downtown Washington.

Part of the Mall is located on land that once formed the deltas of two rivers, the Potomac and the Anacostia. The rest was at one time marshland of the Potomac Tidelands. A portion of the estuary along the southern edge of the Mall, the Tidal Basin, is held within concrete embankments. The Tiber Creek, in its natural state and later as a canal, flowed along the north edge of the Mall along what is now Constitution Avenue, cutting across the Mall in front of the Capitol. The Tiber is now carried in

an underground channel. The water table is generally high and a mud lense occurs between the water table and a large portion of the clay loam soil.

The vegetative character of much of the Mall is meadowlike with informal stands of trees. Two tree panels flank the central portion of the Mall east of the Washington Monument. The principal species of trees in these panels is the Ulmus americana (American elm). The Princeton clone American elm is also represented, as is Ulmus hollandica dauessei (Dauesse elm), a European species. These trees have been planted on the Mall since the 1930's. Other varieties of trees are found in peripheral areas and in West Potomac Park.

The wildlife consists principally of birds and rodents, including especially grackles, sparrows, pigeons, and mice and rats.

The air quality on the Mall varies closely with changing traffic levels in downtown Washington. Measurements taken by the District of Columbia Department of Environmental Services at the Municipal Center, 300 Independence Avenue, less than a half-mile from the eastern part of the Mall, record the annual geometric mean for particulates in 1972 at 82.7 micrograms per cubic meter.

The average of all District of Columbia recording stations for 1972 was 77 mg/m³. A monitoring station at 427 New Jersey Avenue, farther from the Mall but still within a mile and representative of downtown Washington conditions, recorded twenty occasions during 1972 on which the carbon monoxide level exceeded the national standard; twenty-one occasions on which the photochemical oxidant level exceeded the standard, and two hundred and seventy occasions on which the non-methane hydrocarbon level exceeded the standard. The levels of sulfur dioxide and nitrogen dioxide never exceeded their standards in 1972.

Noise monitoring in the District of Columbia is performed less systematically. The downtown Washington levels range in decibels between the upper 60s to low 70s in times of low traffic to between the upper 70s and the low 80s in times of heavy traffic with trucks and buses.

The air pollution and noise levels on a large portion of the Mall are lower to an unknown extent than the general levels at the monitoring stations identified above. Two major factors account for this differential: (1) the distance of much of the Mall from the noise and pollutant generators; and (2) the contribution of the vegetation toward atmospheric purifi-

cation and acoustical control. The first condition prevails on the portions of the Mall that are not close to major traffic conduits. Those portions of the Mall directly adjacent to cross streets (including the areas near tunnel portals) are subjected to particulate, gaseous, and noise levels approaching or exceeding those of the core areas measured outside the Mall. Fumes from idling charter buses parked along Madison and Jefferson Drives create locally severe air and noise conditions. The traffic noise and auto emissions from parking and moving vehicles along the four longitudinal streets rise and fall according to the number of vehicles in motion at any one time.

The processes at work by which trees control air-polluting gases are oxygenation (introduction of excess oxygen into the air through photosynthesis) and dilution (diluting pollution with oxygen-rich air). Plant matter can reduce particulates by precipitation and filtration (trapping the particles on stems and leaves and allowing them to be washed away). Plants can serve as attenuators of sound through dispersal (creation of sound shadows with gentle, steady winds), absorption (accomplished best by trees with thick, fleshy leaves), deflection (accomplished by trunks and heavier branches), and by masking undesirable sound

with the "white" noise of rustling leaves. The factors governing which of these principles are drawn into play under any one set of atmospheric conditions are not well understood, although it is commonly agreed that the denser the vegetation, the more likely the reduction in noise and air pollution. These functions, therefore, are performed most effectively on the eastern portion of the Mall, due to the dense planting on the panels.

Vegetation in sufficient density also lowers air temperatures in the microclimate.

B. Manmade Environment

The manmade elements of the Mall environment include buildings, statues, streets and paths, and the Lincoln Memorial and U.S. Capitol Reflecting Pools. The streets include the four longitudinal streets on the east portion of the Mall, and the cross streets (3rd, 4th, 6th, 7th, 10th, 13th, 14th, 15th, 17th, and 23rd Streets). Ninth and 12th Streets pass under the Mall in tunnels. Several drives are located in the West Potomac Park part of the Mall. Pedestrian sidewalks parallel the streets and are supplemented with additional paths on the Washington Monument grounds and the Ellipse.

Buildings include the Washington Monument, the Lincoln and Jefferson Memorials, several other memorials and monuments, the Survey Lodge, the complex of buildings around the Bureau of Printing and Engraving, and the museums operated by the National Gallery of Art and the Smithsonian Institution. Tourist service structures include comfort stations, a concessions building on 15th Street near the Washington Monument, and several temporary tourist service and information kiosks. The Mall is underlaid with utility lines for electricity, water, sewage, steam, gas, and Western Union service. For the most part these lines are associated with streets passing through the Mall, but additional lines, including obsolete lines, also rest below the Mall surface.

C. Social and Cultural Environment

Estimates of visitation on the Mall very roughly suggest between 80,000 and 90,000 people on an average busy summer day. More precise measurement has not been possible because there is no single point of entrance to the Mall at which the counts can accurately be made. The Washington Metropolitan Area Council of Governments has predicted 142,000 people a day to be visiting the Mall area in 1976. It must be emphasized that these addition-

al visitors will arrive whether or not the 1976 Development Plan is implemented.

The Mall provides a variety of cultural and recreational experiences for visitors with wide-ranging interests. The nation's most highly esteemed art is displayed in Mall galleries. Its technical achievements and natural history are represented in the museums of the Smithsonian Institution. Monuments to the nation's greatest leaders have been built on the Mall grounds.

The Mall's recreational opportunities range from the formalized to the casual. Local residents and out-of-town visitors alike use the Mall for picnics and informal games. West Potomac Park is used for various participatory sports. Tennis courts, baseball diamonds, soccer, football, and polo fields are located there. The Tidal Basin is available for water-related activities. The Lincoln Memorial Reflecting Pool becomes an ice-skating rink during the months when it freezes, and an artificial ice rink will be included in the National Sculpture Garden.

D. Aesthetic Environment

The Mall is cherished for its aesthetic and symbolic attributes. The east-

ern portion of the Mall links the Capitol and the Washington Monument with a sweep of lawn. The flanking tree panels create an appropriate parklike setting for the national museums. As one approaches the Washington Monument from the east, the character of the Mall changes dramatically. A rolling meadow stretches to the Ellipse on the north and West Potomac Park and the Jefferson Memorial on the south. The formal nature of the east Mall is recalled by the long, narrow rectangle of the Lincoln Memorial Reflecting Pool on the west.

The geometry of the Mall axis is the germinating element of Major Pierre L'Enfant's famous plan for the Federal City. In 1901, 100 years after it was first articulated, the L'Enfant concept for the Mall was officially resurrected by the McMillan Park Commission.

Unforeseen developments have taken their toll on the grandeur of this design. Where the McMillan Plan called for narrow "parklike" carriage drives are automotive thoroughfares. Flocks of sheep pictured on the McMillan Plan drawings have given way to flocks of visitors. The ranks of stately elms are straggling. None of the infringing actions are irrevocable, however, and the 1976 Development Plan recommends detailed strategies for restoring the Mall's aesthetic integrity.

3. The Environmental Impact of the Mall 1976 Development Plan

A. Impact on the Natural Environment

Except for minor regrading associated with the removal of the Washington, Madison, Adams, and Jefferson Drives, the only topographical changes in the Mall that would result from the 1976 Development Plan are in the 14th Street area. At present 14th Street rises on an approximately constant pitch. The Plan recommends increasing the slope slightly between Washington and Madison and again between Adams and Jefferson in order to keep the road on a horizontal plane as it passes across the center panel.

The Plan calls for removal of a small earth berm between 14th and 15th Streets to permit placement of a plaza in that area. No subgrade structures are recommended by the 1976 Development Plan. Semi-permanent kiosks and other tourist structures would use pier footings. Soil and water table conditions therefore would not affect or be affected by the Plan.

The 1976 Development Plan recommends planting approximately 300 new trees. One hundred and fifty of these would be planted as two new rows flanking the center panel east of the Washington Monument. The recommended species for this purpose is the Tilia ameri-

cana (American linden). Introduction of the new species would break the monoculture and contribute to a more stable ecosystem. The establishment of a stable ecological balance is a particularly important consideration in these tree panels. A substantial percentage of the originally planted elms have already died from the Dutch elm disease.

The 1976 Development Plan recommends the phased replacement of the forty-four young Princeton clone elms growing in the tree panel in front of the new Air and Space Museum. These trees have shown crown resistance to Dutch elm disease, but they are susceptible to the roundhead bore and have shown a tendency to split at the crotch when they achieve a caliper of 7 to 8 inches. The recommended replacement tree is another Ulmus americana, clone 3-178. This clone was developed by Horace V. Wester in a National Park Service plant pathology research program aimed at breeding a disease-resistant American elm. To date the clone least susceptible to the disease and with most vigorous growth is 3-178.

Trees recommended for other portions of the Mall include flowering dogwoods, cherry trees, and trees from the oak and maple families. Planting of trees, shrubs, and flowering plants is recom-

mended for the new grass panels to be placed in front of the Mall museums between the tourmobile/bike roads and the curb of the present sidewalks beside Madison and Jefferson Drives.

The additional landscaping elements would enhance the aesthetic character of the Mall, provide shade to reduce air temperatures in the microclimate, and can be expected to help reduce noise and control pollution generated by sources outside the Mall (see earlier discussion of the pollution controlling and noise attenuating characteristics of vegetation). Noise and air pollution originating within the Mall will be reduced through the removal of Madison, Washington, Adams, and Jefferson Drives.

B. Impacts on the Manmade Environment

A slight horizontal realignment of 15th Street, creating a symmetrically curving roadway as it passes by the rounded hill at the base of the Washington Monument, and the vertical realignment of 14th Street would not affect the flow of traffic on these streets. Vehicles would still be able to travel these routes with ease within the District of Columbia speed limits.

None of the construction called for by the 1976 Development Plan would require relocation of the utility

lines under the Mall. A new utility corridor beside the tourmobile/bike roads in the eastern part of the Mall would carry new water and electricity lines to service small-scale visitor activities. Because the tourmobile road would hold to the curb lines on the Mall sides of Madison and Jefferson Drives, the existing storm sewer systems could be used with modifications to catch basins.

Additional energy needs on the Mall from elements of the Development Plan would be limited primarily to electricity for new lighting along the circulation network and at building entrances. The tourmobile vehicles in present use are powered by internal combustion engines and will continue to require gasoline fuel and motor oil for operation. The 1976 Plan recommends investigation of alternative power sources for these vehicles. There is no more appropriate site for a large-scale demonstration of model non-polluting transit vehicles than this major park in the nation's capital.

The recommended lighting system would improve the general safety and welfare of Mall visitors during dark hours without adding appreciably to the ambient air temperatures. Criteria for the light sources specify that they will not interfere with the photoperiod of the trees.

C. Impacts on the Social and Cultural Environment

The circulation systems recommended by the 1976 Development Plan would increase the ease and comfort with which visitors may move among points of interest in the Mall. The tourmobile routes are designed for maximum flexibility. Pedestrian paths would permit movements along the same general routes that the paths and sidewalks presently take. Two long paved paths on the grounds west of the Washington Monument are recommended for removal in order to restore the meadowlike character of the area. Pedestrians would be encouraged to wander over the Monument grounds in a random fashion. Proper maintenance of the lawn would avoid conditions of mud or dust that might develop upon overintensive use of a particular zone.

D. Impacts on the Aesthetic Environment

The 1976 Development Plan would dramatically upgrade the aesthetic qualities of the Mall. Idling charter buses and parked cars would be replaced by quieter and less polluting tourmobiles and by bicycles and strolling pedestrians in a truly parklike setting. The elements of the landscaping plan are intended to achieve pleasing proportional relationships;

present visual contrast between surfaces of the tourmobile roads and the pedestrian paths; and restore integrity of character both to the formal portion of the Mall east of the Washington Monument and to the more informal part of the Mall to the west. The addition of new tree rows of a different species would contribute aesthetically by more strongly defining the edge of the center panel.

4. Mitigating Measures Included in the Proposed Action

Criteria for placement of tourist services and information kiosks along the pedestrian paths limit the outdoor sale and consumption of food to west of 14th Street. This measure is intended to curb the output of paper trash and garbage on the Mall. Trash collection from containers must be performed many times daily in peak periods, and litter presents an almost insurmountable problem. An investigation of an automated trash collection system such as the one employed in Disney World in Orlando, Florida, is recommended.

By 1976 Ceremonial Drive, a six-lane road sweeping in a broad arc at the foot of the Capitol between the Capitol Reflecting Pool and the Mall panels, will be constructed. Special design measures are recommended for this street and the other major traffic arteries that will

cross the Mall--4th, 7th, 14th, 15th, and 17th--to minimize their intrusion upon the pedestrian environment. Pedestrians and tourmobiles would cross these roads on panels of a different surface from the road pavement. Where necessary, traffic signals would be installed. The pedestrian crossings of 4th, 7th, 14th, and 15th Streets would align with the tourmobile and pedestrian paths along the Mall and might be surfaced in the same material as the tourmobile/bike roads. The crossings of Ceremonial Drive would be placed at Pennsylvania and Maryland Avenues, and the selection of paving material there would be coordinated with the Pennsylvania Avenue Development Plan. Bollards and landscaping details would guide pedestrians to the proper crossing points on Ceremonial Drive and on 14th and 15th Streets. Pedestrian traffic crossing 17th Street would be treated similarly.

The area under the tree panels between the two pedestrian walks is envisioned as an outdoor exhibition area for the museums and galleries along this part of the Mall. Exhibitions and activities of a generally passive nature could occur in the dappled sun under the canopy formed by the elms. The Development Plan recommends that extreme care be taken in (1) the selection of appropriate activities; (2) the selection of a specific location for each activity; and (3) the protection of the ground where each activity would be taking

place. Trees can be damaged permanently or killed if planning in these three areas is careless. Pressure from feet, hooves, and wheels compresses the earth underneath. This compaction restricts the flow of vital oxygen to the tree roots.

The Development Plan recommends protection techniques by which damage to the roots from compaction can be avoided. The Mall tree panels are laid out according to a grid system, with trees placed on fifty-foot centers. Whenever possible, the Plan recommends the activity sites to be located in those zones within the tree panels already vacant because one or two trees are missing from the grid.

After the site has been selected, it is recommended that the soil be renovated using a large spiked roller device to promote aeration of the soil (see Figure 1). Fertilizers may be introduced at this point according to the need of the soil for nutrients, which must be determined by laboratory tests of soil samples. The surface most suitable for short-term relatively non-intensive uses is wood chips (Figure 2). A two to three inch layer of wood chips on a one inch layer of peat moss affords a versatile protective layer. This surface can be used by itself or in combination with other more rigid (and more protective) surfaces. In the latter instance, wood chips are very useful

around the edges of harder surfaces (Figure 3). Pedestrian traffic to an activity area would become more intensive as the various routes of access converge on the activity area. Wood chips could be used to cover the transitional zone between the activity area itself, which would be used most intensively, and the area within the tree panels surrounding the activity area through which pedestrians approach.

A monolithic surface is recommended for the more intensive activities of longer duration. The best surface in terms of affording protection to the tree roots is the wood platform. These platforms would be mounted on piers driven into the earth so as not to cut the bigger tree roots. The longevity of the timber platform is limited by natural factors of weathering and wear and would determine the length of time an activity mounted on such a platform could endure.

Precast concrete slabs laid on crushed rock sieved to 1 1/2 to 2 inches form a longer-lasting protective surface. If a precast platform is to remain longer than three months, its construction should be preceded by installation of an air ventilation system into the ground beneath it to feed oxygen into the earth (Figure 4). Although the platform itself can endure longer, it should be dismantled at the end of one year in order to assure protection of the roots.

The 1976 Development Plan recommends an on-going study to determine more precisely the levels of intensity, type, scope, and duration of uses that should be permitted within the tree panels. In general, the Plan urges extreme caution. The intensity of use during the three week National Folk Festival in 1973, sponsored jointly by the Smithsonian Institution and the National Park Service and which took place in West Potomac Park, pulverized the wood chip surface that had been spread over the land there. Activities of this scale and intensity must not be permitted in the Mall tree panels.

5. Adverse Impacts Which Cannot be Avoided Should the Proposal be Implemented

A. Short Term Impacts

Short term disruption would be experienced during the construction of the circulation systems proposed in the 1976 Development Plan. Construction of the recommended elements is expected to require one year. Special care would be taken to prevent damage to the trees during construction of the pedestrian paths and tourmobile roads (see Figure 5). Where gradients are slightly changed due to removal of the Madison, Washington, Adams, and Jefferson Drives, adjacent land would be resodded or reseeded. At

this time the soil would be treated with restorative techniques outlined above (Figure 1). Noise standards for construction equipment would be applied and provisions would be written into construction contracts requiring dust and noise control. Water sprays would be used to control dust.

Traffic flow on 14th and 15th Streets would be slowed as these roads are realigned. Every effort will be made to keep two lanes in each direction open at all times. Additional traffic on these and other streets from heavy construction equipment would be minimized by requiring those vehicles to move during off-peak hours.

B. Long Term Impacts

The recommended treatment of the area where 14th and 15th Streets cross the Mall may necessitate the taking of a maximum of twelve mature trees in good or fair condition, one tree in poor condition, and four immature trees that may be transplanted. A maximum of nine trees in good condition might be taken in the implementation of the Plan on the rest of the Mall. However, because topological information was unavailable at the level of the present study, the exact number of trees to

be taken cannot be precisely predicted and may be less than the numbers cited above. The Development Plan recommends making every effort to keep the trees.

The realignment of 15th Street as it passes through the Mall would require taking down a structure, a concessions building that serves the Washington Monument. This building is architecturally undistinguished and it is an obtrusive element on the Washington Monument grounds. The presence of this structure impinges on the pilgrimage character of the pedestrian's approach to the Monument. The structure is not necessary for practical reasons, because the tourist services dispensed from the building would be provided in several nearby locations. The fact that this concessions building stands on the Mall grounds, and hence on land designated as a National Historic Monument, should not be reason for its preservation when every aesthetic and practical consideration calls for its removal. The recommendation that no comfort stations be built on the Mall east of 14th Street may result in increased congestion within the museum buildings. Similarly, the recommendation to prohibit sale of food on this portion of the Mall in order to curb the trash problem may direct

more people to facilities inside the buildings.

The decision to recommend against building additional comfort stations is based on two considerations. Above-ground facilities represent an entirely inappropriate use of this extremely valuable and irreplaceable land. Underground facilities, while not clearly inappropriate, are undesirable because most people feel ill at ease using them. The entrance structures for the underground facilities would be as out of character and as inappropriate as the above ground buildings would be. Comfort stations would be provided in the tree bosks between 14th and 15th Streets and in several other locations west of the Washington Monument. They would also be available in Mall buildings under construction or in planning stages, including the National Visitor Center being planned to surround the base of the Monument below ground level.

Removing the availability of about 1,300 parking spaces on the Mall (as well as the parking lot on the Washington Monument grounds beside Constitution Avenue) may place an additional burden on downtown Washington parking facilities and increase traffic congestion in the streets around the Mall. The banishing of idling and parked charter

buses from the Mall may have the same effect. The National Capital Park Service is making plans to accommodate the increased demand for parking in two ways. The National Visitor Center at Union Station will park some 1,700 cars (or a number of buses and correspondingly fewer cars). The visitors will be carried to the Mall on the tourmobile system. The second measure is the institution of a shuttle bus system from outlying parking lots to the Mall. Visitors will be encouraged to leave their cars at these lots and board buses for the trip downtown. The system will bring additional bus traffic to the downtown streets, but it will relieve the pressure from automobile traffic bound for the Mall. The success of the system will depend on an ambitious program to be launched by the National Park Service to educate the visitor so that he knows what to do and where to go when he arrives in town. The fact that the 1976 Development Plan would essentially remove the tourmobile from city streets would help reduce congestion in downtown Washington.

The general problem of traffic circulation in the Washington area during the Bicentennial celebration is under study by the

Metropolitan Area Council of Governments. The removal of the parking spaces on the Mall may actually work to reduce congestion to the extent that congestion is created by vehicles driven by people who come to the Mall with the assumption that they will find parking and then find none.

6. The Relationship Between Short-Term Use of Man's Environment and Long-Term Productivity

The replacement of the four longitudinal streets on the Mall east of 14th Street with routes for tourmobiles, bikes, and pedestrians, and the landscaping and lighting of the Mall so as to enhance these circulation systems and the aesthetic quality of the Mall as a whole would demonstrate a commitment to protecting a national treasure for the use of future generations as well as our own. Not one of the recommendations of the 1976 Development Plan would sacrifice long-term productivity of the Mall park to allow a short-term use.

7. Irreversible and Irretrievable Commitments of Resources Which Would Be Involved in the Proposed Action

The recommendations of the 1976 Development Plan would make an irreversible and irretrievable commitment of the

resources of the Mall to serve as a national treasure for the people of this country. The Plan adheres to the conceptual framework presented in the 1966 Washington Mall Master Plan, and does not preclude implementation of future projects that fall within the framework of that Plan.

8. Alternatives to the Proposed Action

The circulation, visitor services, landscaping, and lighting recommendations of the 1976 Development Plan were reached only after consideration of a number of alternatives within each category. In only a few of the cases did the environmental characteristics of the choices vary.

The closing of roads other than Madison, Washington, Adams, and Jefferson was not among the alternatives given consideration, although the 1966 Mall Master Plan calls for tunneling 4th, 7th, 14th, and 15th Streets under the Mall and closing 17th Street and other West Potomac Park roads to traffic. These tunnelings cannot be accomplished before 1976. The closing of 17th Street and other roads was predicated on the completion of the South Leg of the Inner Loop Freeway, which also cannot be implemented by 1976.

The decision to recommend a single circulation network for bicycles and tourmobiles was reached after rejection

of an alternative scheme to route bicycles and pedestrians on the same paths, and another scheme to build a separate network for bikes. Bicycles, because they are silent, are very dangerous to pedestrians, and therefore it was decided the two should be kept separate.

Special bike paths would be inviting to pedestrians. On the other hand, bicyclists are not likely to use the compacted, crushed stone pedestrian paths of the recommended scheme because the paving is not well suited to bicycling. The tourmobile/bike roads would be twenty feet wide, thus amply accommodating both bikes and tourmobiles. The tourmobile vehicles travel at speeds of 5-7 mph, while bicycles typically travel at equal or faster speeds. For these several reasons, it is felt that the two vehicle types are compatible.

The 1976 Development Plan recommends forbidding all automotive traffic from the tourmobile/bike roads except service and emergency vehicles. Charter buses, which presently discharge their passengers into museums from Madison and Jefferson Drives, would be required to perform these operations from the Constitution and Independence Avenue sides of the buildings. Consideration was given initially to allowing these charter buses access to the inner Mall, but this scheme was discarded for envi-

ronmental and aesthetic reasons. Charter buses are noisy, smelly, emit noxious fumes, and are entirely out of scale with the pedestrian nature of the Mall. It was decided that of all the elements of the existing street network within the Mall, the charter buses are the most offensive. In order to minimize the potential inconvenience due to the presence of these buses on Independence and Constitution Avenues, and to insure the safety of the passengers, several courses of action are recommended. Curb cuts would be made to allow all of the driveway loops in front of the buildings to be used by buses for loading and unloading. If the demand proves too great to be handled by this measure, curb cuts would be made along the streets to create pull-off lanes for the buses. A third alternative, to be used if the first two measures are insufficient to meet the demand, would be to utilize land between the buildings adjacent to the north-south circulation systems.

An example of such a space is the drive flanking 12th Street at its north tunnel portal. Another such location is the land between the 12th Street south tunnel portal and the Department of Agriculture Building adjacent to the new Metro entrance.

The decision to recommend an additional row of trees on either side of the central panel of the Mall east of the Washington Monument, and the subsequent decision to recommend for these rows a species of tree other than the American elm, both have ramifications for the Mall environment. As has been previously discussed, the elm trees growing in the tree panels are subject to Dutch elm disease. In future years increasing numbers of the trees will die and have to be taken down. When this occurs, the elm panels will no longer be able to fulfill one of their intended functions, which is to frame the Mall center space and direct the eye from one end of it to the other. The planting of an additional row of trees on either side of the center panel would make it possible for the removal and replacement of dead elms to go on without visually interrupting the edge along the center panel.

The decision to recommend the Tilia americana (American linden) for these extra rows involved the consideration of several alternatives. The possibility of using the American elm clone 3-178 was discarded because it is not known at this time whether this clone will survive the onslaught of Dutch elm disease over

a long period. It was also decided that introduction of a different species on the Mall would be beneficial for ecological reasons.

The characteristics of the American linden are generally similar to the seedling American elm now on the Mall. Other trees considered that also share certain similarities with the Mall elm--the Mississippi hackberry and the Overcup oak--are not available from nurseries in sufficient quantity for the purposes of this Development Plan.