CHAPTER 4

AFFECTED ENVIRONMENT

4.1 NATURAL RESOURCES

4.1.1 Geophysical Resources

The Washington Monument Grounds include approximately 73 acres of rolling terrain. The Grounds include a gently sloping mound that rises about 25 to 30 vertical feet from the perimeter of the Grounds to the base of the Monument at slopes between approximately 3 percent and 7 percent grade. The topsoil immediately surrounding the Monument is an artificially created mound composed entirely of introduced Udorthents association fill material (USGS 1965), consisting of medium red-brown fine sandy clay with some gravel and cinders present (Hartman-Cox). Accordingly, there is no potential for prime or unique farmland on the Monument Grounds.

Existing topography at Monument Grounds.

The portion of Washington, DC that contains the Monument Grounds lies within a geologic province known as the coastal plain, where sedimentary soils overlie crystalline bedrock sloping gradually to the south or southeast. In the southern part of the District of Columbia, Cretaceous marine deposits such as stiff plastic clays or very compact clayey sands overlie the bedrock, and Pleistocene stream terrace deposits often overlie the Cretaceous material in the downtown area. Under the Monument, however, an unusual profile is present where shallow bedrock and the erosion of Cretaceous soils by Pleistocene streams led to Pleistocene terrace deposits lying directly upon bedrock.

Beneath the Washington Monument, Pleistocene materials comprise a range from medium plastic slightly to moderately organic clays to very compact mixtures of sand and gravel with some boulders, extending upward from bedrock to the fill materials that compose the topsoil of the Grounds. From core borings, the substrate of the Monument Grounds has been found to include (progressing from the ground surface down): fill 15 to 25 feet thick, sand and clay 10 to 15 feet thick, sand and gravel 20 to 40 feet thick, sand 0 to 40 feet thick, clay 2 to 40 feet thick, and bedrock. Groundwater is present in the subsoil profile of the Monument at a level that varies with the tide of the Potomac River and with the seasons (Hartman-Cox). In 1930, the groundwater table was documented at about Elev. 0 MSL feet referenced to Mean Sea Level (MSL), while in 1973 the water table was recorded at around Elev. –10.5 feet MSL (Hartman-Cox).

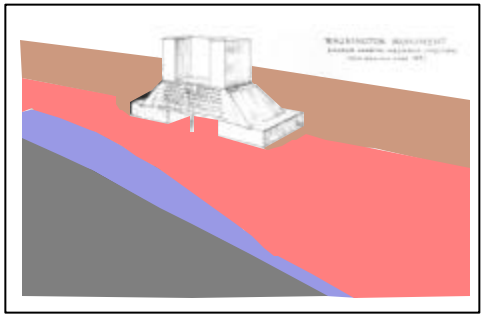


Diagram of Washington Monument substrata.

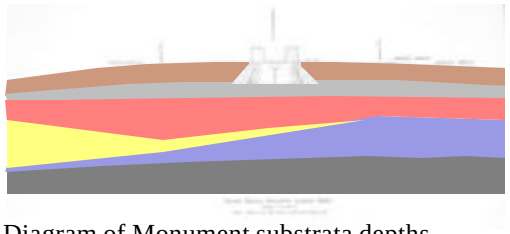


Diagram of Monument substrata depths.

The original Monument foundation prior to underpinning.

Background

The 1791 L'Enfant Plan for the National Mall called for an equestrian statue of Washington to be placed at the intersection of the east-west axis of the Mall from the U.S. Capitol to the Potomac River and the perpendicular north-south axis to the White House. However, this site was found to be too marshy to support the statue and, in 1848, Congress passed a resolution identifying a site 125 feet to the south and 375 feet to the east as the location for an obelisk monument (Mueser Rutledge). Initial construction of the Washington Monument lasted from 1848 until 1854, when all development halted for 24 years. When construction stopped, the Monument stood at a height of 156 feet and weighed 31,152 tons, including the foundation.

By 1878 the incomplete obelisk had settled out of plumb and leaned 1.75 inches to the north (President) and a project was initiated to underpin the Monument and address the differential settlement conditions. An 1877 Senate report indicates that engineers believed the project of excavating below the existing Monument foundation to place the underpinning would be very hazardous since the bottom of the proposed underpinning would be only 2 feet above the high tide level of the Potomac River and 6 inches below the groundwater level. Despite these concerns, the underpinning of the Monument was completed in 1879, having involved the excavation of over 70 percent of the original 6,400-square-foot foundation area and the correction of the vertical tilt of the Monument (Hartman-Cox). The underpinning consisted of concrete footings 13.5 feet thick that extended 18 feet under the original foundation, with buttresses added above the footings and around the original foundation. The new composite foundation extended 37 feet below the ground and covered a total bearing area of 16,000 square feet (Hartman-Cox). A Senate report in 1880 indicated that during the underpinning process, an average settlement of about 2 inches had occurred at the Monument's corners. The same report stated that, since the underpinning had been completed, 17,000 tons of load had been placed upon it causing subsidence of 0.5 inches on the southwest corner of the Monument, 0.47 inches on the southeast corner, 0.52 inches on the northeast corner, and 0.53 inches on the northwest corner (President).

By 1884, construction of the Monument had been completed. The finished structure and surrounding fill created an aggregate weight of 81,120 tons of force upon the soil beneath the Monument. Since the completion of the underpinning, 34,604 tons had been added to the obelisk structure yielding subsidence of 2.02 inches on the southwest corner of the Monument, 2.02 inches

on the southeast corner, 2.03 inches on the northeast corner, and 2.08 inches on the northwest corner (President). By 1886, 20 feet of additional fill were added around the base of the Monument and resulted in an additional 0.75 inches of total settlement (Hartman-Cox).

Due to the pronounced initial settlement of the Monument, and the continuing gradual progressive settlement, improvements to the Grounds have been the subject of study, with particular focus on the structural capacity of the Monument substrate. The McMillan Plan of 1901 proposed an extensive masonry treatment for the Grounds, but would have required the removal of a large soil load from the northwest to southwest quadrant and an extensive loading of soil east of Monument to bring the eastern Grounds to the height of the mall. Given the settlement that had been recorded over the existence of the Monument and the large extent of soil disturbance proposed in the plan, implementation of the McMillan Plan was stalled pending analysis (President).

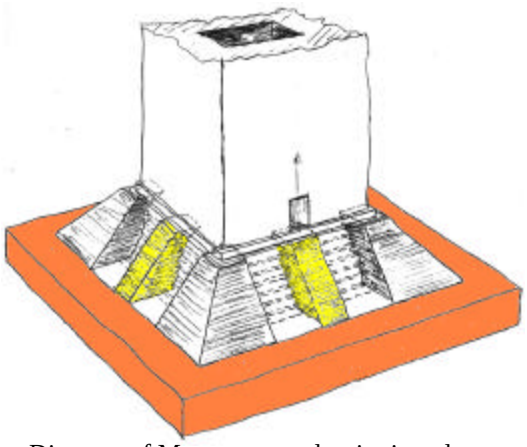
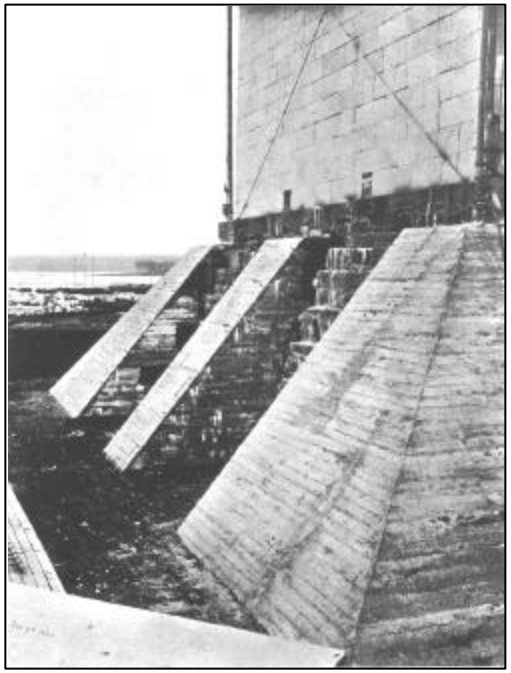


Diagram of Monument underpinning plan.

1930 Study

In 1923, the Coastal and Geodetic Survey began taking measurements of the Washington Monument and found that 0.75 inches of settlement had occurred since 1886, at an average rate of 0.02 inches per year. By 1930, the total settlement since commencement of the underpinning construction in 1879 had reached about 5.5 inches. Given the continuing slow settlement of the Monument, Congress organized an advisory committee of architectural and engineering experts to investigate the construction feasibility of the McMillan Plan. The advisory group made an initial observation of the Monument site and immediately concluded that no adequate design work could be completed for the Grounds until more complete understanding was acquired of the substrate of the Monument. Accordingly, seven core borings to bedrock were taken around the perimeter of the driveway at the base of Monument (President).



Buttresses were used to reinforce the Monument's underpinning.

From the 1930 soil borings, the foundation of the Washington Monument was found to rest upon a dense bed of sand and gravel underlain by a 20- to 40-foot layer of stiff plastic wet blue clay. Bedrock was encountered at about 80 feet below the foundation of the Monument. The groundwater level was identified at Elev. 0.0 MSL and was described to vary 0.28 feet periodically with the tide of the Potomac River and up to 8 feet seasonally (President).

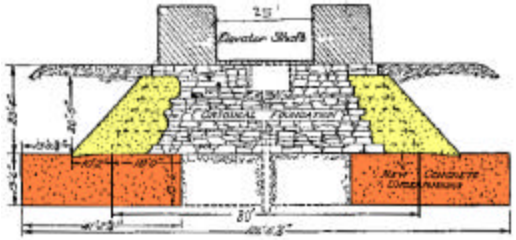
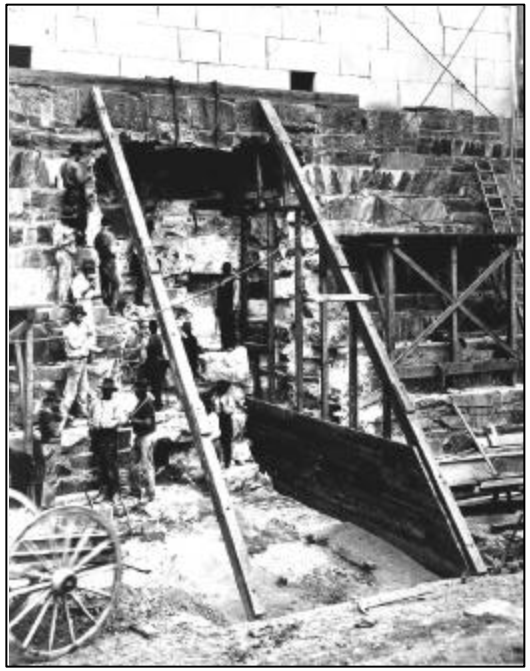


Diagram of the Monument's underpinning detail.



Buttressess construction in 1879.

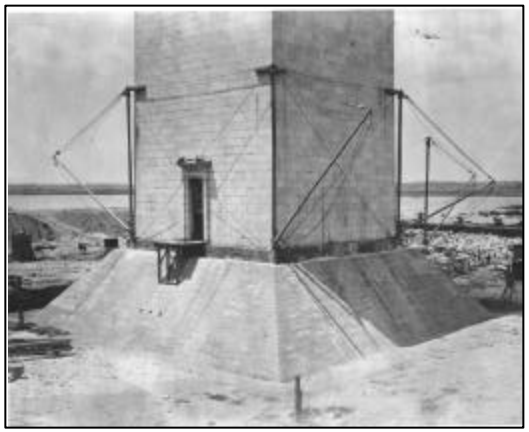
Given the discovery of the thick layer of wet clay beneath the Monument, the advisory committee conservatively concluded, through basic soil weight calculations, that the proposed movement and unbalance of soil loads associated with the 1901 plan would "seriously endanger" the Monument. It was determined that the plan could only be implemented if the Monument was underpinned to bedrock. However, upon review of the high cost and risks considered inherent in this option, the advisory committee recommended that further consideration of the 1901 plan should be abandoned. The architects of the committee then devised new "Formal" and "Informal" plans for treatment of the Washington Monument Grounds (President).

In 1931, a second set of core borings were taken at greater distances from the base of the Monument, to allow feasibility analyses of the Formal and Informal plans. In the half circle clockwise from northwest to southeast of the Monument, the substrate was found to include a 30- to 40-foot bed of soft clay composed of compressed river mud. In the half circle clockwise from the southeast to the northwest, the clay was not as thick and in some areas had been eroded by ancient streams and replaced with sands or gravel. The characteristics of the clay indicated that, without the possibility of flow due to excessive pressures, the material made an adequate foundation to support the Monument. However, it was concluded that by removing a substantial amount of surface soil around the Monument and thereby decreasing the resisting capacity of overlying layers, or by adding extensive soil loads and increasing pressures on underlying soils, the clay layer could be squeezed and hazardous unstable conditions at the Monument site could result (President).

Under these assumptions, the advisory engineers recommended that both the Formal and Informal plans would be hazardous and that future plans for the Monument Grounds should be revised to include less shifting of soil loads. It was further stated that up to 40,000 cubic yards of fill might be safe on the panel between 14th and 15th Streets, if the material was carefully placed to avoid localization of increased pressure. From the Monument westward, it was believed that the minimum of change should be pursued, involving only the careful smoothing of contours. In 1932, NCPC stated that, "as no thoroughly satisfactory plan to safeguard the stability and aesthetic possibilities at the Washington Monument" had yet been found, NCPC favored delay of improvements on the Monument Grounds as necessary for further study of the project (President).

1962 Study

In 1962, a new structural study of the Monument substrate was initiated and a set of nine core borings were taken, four at the corners of the Monument and five extending the range of the previous borings. Given the compressive strength qualities of the clay and other materials in the boring samples, as tested in a laboratory, several conclusions were drawn. Since 1886, 1.4 inches of slow progressive settlement of the Monument had occurred at an almost uniform rate. The characteristics of the borings indicated that this was likely due to compaction in the sand and gravel substrate from vibrations or movements from wind loading. Considering this likelihood, and given lab measurements of the potential compaction or creep of the underlying clay, the following recommendations were made to guide plans for the Monument Grounds, representing less conservative guidance than that from the 1930 study. Within 250 feet of the Monument, it was recommended that no change be implemented. Beyond 250 feet from the Monument, fill could be added to Elev. 25 MSL. From 250 to 350 feet from the Monument, cuts should be maintained at a 3:1 slope. Beyond 350 feet from the Monument, cuts could be made to Elev. 5 MSL. Finally, movements and vibrations should be minimized and observed while pile driving, since records exist of settlement hundreds of feet from pile driving that caused sand compaction (Barber 1962).

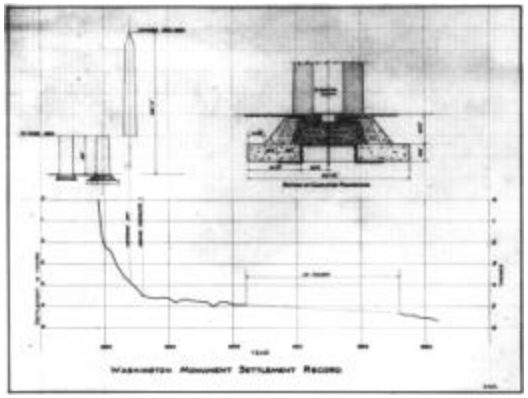


Underpinned Monument foundation.

1973 Study

In 1966, an improvement plan was prepared for the entire National Mall including the Washington Monument Grounds. In 1973, the plan was revised and an engineering report was prepared evaluating the new proposal for the Washington Monument Grounds. The plan incorporated an extensive underground facility designed to serve a capacity of 600 visitors every 45 to 60 minutes, including an underground corridor providing elevator access under the Monument (Hartman-Cox).

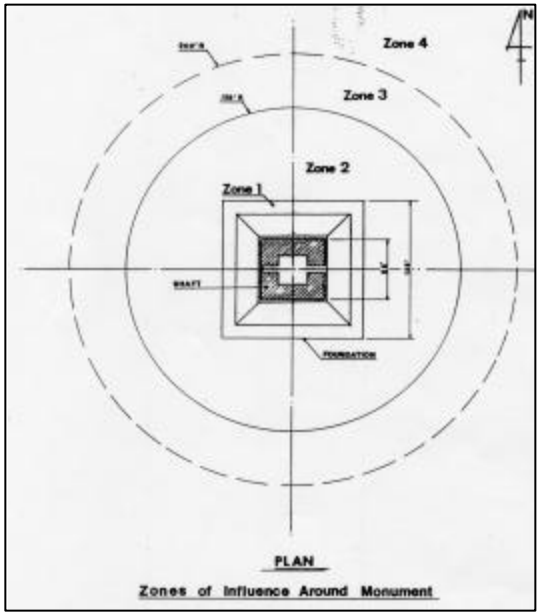
The 1973 study reported that more than 4.5 inches of total settlement had occurred relatively quickly between completion of the Monument underpinning in 1879 and completion of the Monument in 1886, which indicated the Monument substrate had not been completely preconsolidated and that it underwent rapid initial compression under the increased loads of the completed obelisk and additional fill material. The study further found that, from 1886 to 1972, approximately 1.5 inches of slower progressive Monument settlement had occurred resulting in



Early Monument settlement record.

about 6 inches of total settlement over the existence of the Monument since the completion of the underpinning (Hartman-Cox).

To investigate the continuing progressive settlement of the Monument, and the consequent feasibility of the 1973 plan, a new series of three core borings were taken on the Monument Grounds. The strata identified in the borings included, in order of descending elevation: fill, silty sands and clays, compact sand and gravel, stiff plastic clay, and decomposed rock descending to bedrock. The groundwater level under the Monument had been lowered over time by drawdown due to development along the National Mall and the water table was encountered in the borings at around Elev. –10.5 MSL. It was suggested that the Monument could potentially have experienced accelerated settlement from 1962 to 1973 due to this lowering of the groundwater table; however, no measurements were available to verify this possibility and there were no visible signs of distress to the Monument. Based on new laboratory measurements of the characteristics of the boring samples, more relaxed recommendations than those from the 1962 study were made regarding engineering actions within radial zones of potential influence on the Monument Grounds (Hartman-Cox).



Zones of influence surrounding Monument.

Regarding soil loads, the 1973 study recommended that the net change in load within 63 feet of the Monument center (overlying the Monument foundation) should not exceed 500 pounds per square foot, although this requirement was relaxed for small dimension passageways or corridors. The recommended limit for an increase in loading within 150 feet of the Monument center was 1,000 pounds per square foot, while the recommended limit for reduction of loading in the same area was 1,500 pounds per square foot asymmetrically or 2,000 pounds per square foot symmetrically. It was further stated that beyond 150 feet from the Monument center, net loading changes should have little effect, but that the addition of 1,500 pounds per square foot or reduction of 2,000 pounds per square foot loading, over a lateral dimension of more than 150 feet asymmetrically or 200 feet symmetrically should be kept beyond 200 feet from the Monument center. Finally, the recommended limits of structural bearing on soils on or below the foundation of the Monument were as follows: 1 ton per square foot in the top fill layer, 1.5 tons per square foot in the sandy clay layer, 2 tons per square foot in the silty sand layer, 3 tons per square foot in the compact sand and gravel layer, and 2 tons per square foot in the plastic clay layer. No structural bearing was recommended below Elev. 0 MSL because of potential groundwater effects (Hartman-Cox).

Regarding excavation, the 1973 study recommended that no cuts below Elev. 16 MSL should be made within 115 feet of the Monument center, and that the width of excavations in that area should not exceed 45 feet. Beyond 150 feet from the Monument center, excavations to Elev. 0 MSL were considered acceptable given that the width of cuts was not over 100 feet. Between 115 feet and 150 feet from the Monument center, the recommended maximum excavation depth was a theoretical line sloping downward at 2.6:1 from Elev. 16 MSL. Finally, it was recommended that the excavation for a widespread structure should be carried out with great caution, and should balance load removal on opposite sides of the Monument at all times, and that the walls of excavations should be sloped wherever possible or retained by cofferdams on soldier piles in pre-augured holes where necessary (Hartman-Cox).

1984 Study

In 1981, NPS created a new DCP for the Washington Monument and its Grounds. The plan proposed extending the row of elms from the National Mall to the panel between 14th and 15th Streets, leveling the area between the new elms by terracing the north/south slope to the east of the Monument, removing the Monument Lodge, removing asphalt walks and replacing with new regraded walkways, installing planting beds and trees in a berm around the base of the Monument, and realigning the 15th Street corridor and constructing a tourmobile rest stop on the street (NPS 1981).

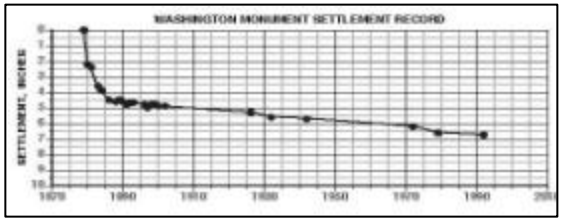
In 1984, a Washington Monument Settlement Analysis study was prepared to evaluate the potential effects of the 1981 plan to add fill and regrade on the west side of the Monument for the installation of new walkways to 17th Street, the parking lot, and the Survey Lodge. The study reported that the maximum thickness of the proposed fill would be approximately 7 feet deep at a location 320 feet to the northwest of the Monument center. The estimated increase in pressure below the center of the Monument, at the middle of the clay layer, was 10 pounds per square foot, which was less than one-tenth of 1 percent of the existing pressure (Mueser Rutledge 1984).

Based on the predicted substrate pressure changes, the report stated the expected settlement of the Monument to be 0.015 inches at the southeast corner of the Monument and 0.06 inches at the northwest corner of the Monument, yielding maximum differential settlement of 0.045 inches and deflection at the top of the Monument of one-third of an inch. Additionally, the report asserted that

the slow rate of continuing settlement of the Monument was completely explainable in terms of normal physical compression of underlying soils. Therefore, in the least conservative engineering finding to date, the study concluded that implementation of the proposed grading would not likely cause Monument displacement of engineering significance. It was further recommended that before earthwork commenced, the Coast and Geodetic Survey go through a cycle of measurements on the Monument and repeat the measurements after construction so that the effects of the project could be observed and noted (Mueser Rutledge 1984).

Current Studies of Soils and Groundwater

In 1989, the 1981 DCP for the Washington Monument was revised and in 1993 the plan was further refined and approved by CFA, DC SHPO, and NCPC. The plan did not include an evaluation of structural effects on the Monument; however, a detailed record of cumulative Monument settlement through 1995 was compiled toward evaluating the general engineering feasibility of the 1993 plan for the Grounds.



Updated Monument settlement record

Additionally, soil borings have recently been taken for engineering analysis of the current proposed action for the Grounds. In the borings, the groundwater table under the Washington Monument Grounds has been documented at about Elev. –5.7 feet MSL. The Potomac River is in proximity to the Grounds, with a water surface level at approximately sea level (Elev. 0.0 MSL), creating potential for abundant groundwater recharge from the Potomac at the Monument Grounds. Accordingly, while the water table will naturally fluctuate over time, engineers have predicted that the average ground water level at the Grounds will equalize at an elevation a few feet below sea level, potentially rising to approximately sea level during severe storm events (Hartman-Cox).

The greatest depth of construction associated with the current proposed action for the Monument Grounds is Elev. 3.5 MSL. This would be substantially above the existing groundwater level of Elev. -5.7 MSL and several feet above the potential high groundwater level that engineers have predicted. Therefore, the proposed action would not require dewatering. Additionally, at the predicted groundwater elevations, the water table would be at least 13 feet above the highest elevation of the wet plastic clay substrate on the Grounds at Elev. -19 MSL. Thus, changes in the water table due to projects or factors outside the scope of the proposed action would not likely

dewater the clay layer. Given these conditions, the current proposed action would be essentially unrelated to and unaffected by potential slight changes in the water table.

4.1.2 Water Resources

Surface Water

Washington, DC lies in the Potomac River drainage basin, a subbasin of the Chesapeake Bay watershed. All surface waters in the District of Columbia flow to the Potomac River either directly or through tributaries of the Potomac such as Rock Creek or the Anacostia River. At the Washington Monument, approximately 61.8 acres (85 percent) of the Grounds are covered in pervious surfaces, about 10.9 acres (15 percent) are covered in impervious surfaces, and no permanent water bodies are present. Stormwater that falls on the Grounds either infiltrates permeable vegetated ground during overland flow or enters closed drainage systems and storm sewers. On the west side of the Monument, two field drains convey stormwater into a drainage system where the stormwater is filtered through an oil/grit separator before release into the Tidal Basin. North of the Monument, field drains along sidewalks lead into a combination storm and sanitary sewer that flows into a combined sewer at Constitution Avenue. To the east and south of the Monument, field drains located near the Monument Lodge and along sidewalks lead into combined storm and sanitary sewer lines that flow into a combined sewer at 15th Street.

View from the top of Washington Monument to the Tidal Basin.

The combined sewer trunk lines lead to the Blue Plains Treatment Facility where, under normal conditions, waters are cleaned before release to the Potomac. The Blue Plains facility operates in compliance with the permitting criteria of the National Pollutant Discharge Elimination System (NPDES). However, under severe storm conditions, the combined storm and sanitary flow may overflow the unified sewer lines, entering a piped system that bypasses the treatment facility and discharges directly to the Potomac. The District of Columbia has studied this issue and is preparing a plan to address the replacement of combined sewers with separate storm and sanitary sewer lines.

Wetlands

The National Wetlands Inventory (NWI) of the U.S. Fish and Wildlife Service produces information on the characteristics, extent, and status of the nation's wetlands. According to the NWI, the Washington Monument Grounds do not include wetlands.

Floodplains

According to the Federal Emergency Management Agency, a portion of the southeastern Washington Monument Grounds lies within the 100-year floodplain of the Potomac River. However, since the landscaped Grounds consists entirely of introduced fill, the area does not contribute to the productivity of the floodplain ecosystem (NPS 1995).

Past studies of flood potential at the Monument Grounds have indicated that the area along 17th Street is particularly prone to flooding. The U.S. Army Corps of Engineers has proposed emergency plans to reduce the northward spread of flooding waters near the Monument by creating an earth levee with sandbags across 17th Street. A berm on the northwest portion of the Monument Grounds functions as earth storage for the levee (NPS 1995).

Trees scattered across the Monument Grounds.

4.1.3 Vegetation

The Washington Monument Grounds have been developed and landscaped, distinctly altering the environment from its natural conditions. Site improvements including the addition of fill, establishment of prominent open areas and crowd assembly areas, and general maintenance practices have created an entirely introduced vegetative environment (NPS 1981).

The Monument Grounds consist of a park-like grassy area and slightly over 5.5 acres of planted tree area. Elms (*Ulmus* spp.) line the Grounds along Constitution Avenue, 17th Street and 14th Street (with a corresponding break in the line at the primary east-west vista of the Mall), while Japanese cherries (*Prunus serrulata*) are dominant on the northern portion of the Grounds. On the southern portion of the Grounds, planted woody vegetation includes mostly American elm (*Ulmus americana*), American linden (*Tilia americana*), red oak (*Quercus rubra*), Eastern white pine (*Pinus strobus*), American holly (*Ilex opaca*), sugar maple (*Acer saccharum*), and Japanese cherry.

Other woody species present include gingko (*Gingko biloba*), white ash (*Fraxinus americana*), pin oak (*Quercus palustris*), willow oak (*Quercus phellos*), white oak (*Quercus alba*), catalpa (*Catalpa bignonioides*), mountain maple (*Acer spicatum*), Norway maple (*Acer platanoides*), and white fir (*Abies concolor*) (NPS 1981). One very large and unique mulberry tree (*Morus alba*) is located on the Grounds to the southwest of the Monument.

There are no known critical habitats or endangered or threatened plant species on the Monument Grounds (Gray). Additionally, there are no designated conservation areas or natural areas on the Grounds.

Poor soil conditions and disease have led to the premature death of a number of elm and Japanese cherry trees on the Monument Grounds (NPS 1981). American elms in the vicinity of the Mall, like those throughout a majority of the eastern United States, have suffered from the spread of Dutch elm disease. The annual loss of American elms at the Mall was reported to be about 1 percent in 1993. Lost American elms around the Mall have been replaced by NPS with elm species that demonstrate more resistance to Dutch elm disease (Smithsonian).

4.1.4 Wildlife and Aquatic Life

The entire Washington Monument Grounds have been disturbed and landscaped, and previous marshlands and man-made pools on the Grounds have been permanently filled. Therefore, the Monument Grounds do not comprise natural environments for terrestrial or aquatic animal species (NPS 1981). No critical habitat is present, and no known endangered or threatened animal species currently inhabit or utilize the Grounds (Gray). The wildlife community on the Grounds likely includes common urban species such as small mammals and birds including gray squirrels (*Sciurus carolinensus*), Norway rats (*Rattus norvegicus*), pigeons (*Columba livia*), house sparrows (*Passer domesticus*), and starlings (*Sturnus vulgaris*).

4.1.5 Hazardous Materials

Soil borings at the Monument Grounds

The Monument mound is composed of fill material from the 1800s. Since the proposed action would disturb these sediments, preliminary environmental soil investigations were conducted at six locations within the proposed area of disturbance to assess the potential for contamination.

During the environmental soil tests, borings were made to the depth of disturbance in areas affected by the proposed site improvements. Soils were screened in the field for contaminants and one sample from each boring was laboratory-tested for contamination. Since the proposed construction and operation of Alternative A at the Monument Grounds would not include residential features, contamination levels in the soil samples were compared to the EPA's risk-based standards for contaminant levels in both non-residential and residential areas.

Analysis of the soil samples revealed levels above the EPA non-residential standards for one contaminant at three boring locations. Within the near-surface soils at these three locations, arsenic levels were slightly above the EPA non-residential standard of 3.8 mg/kg. Relative to the EPA residential standards, two contaminants were detected at elevated levels, including arsenic and benzopyrene (a volatile organic compound). Arsenic was measured at about 1 to 4 mg/kg at near-surface depths in six boring locations, which is above the EPA residential risk-based level of 0.43 mg/kg. Benzopyrene was measured at one location at 0.594 mg/kg, which is above the EPA residential standard of .087 mg/kg.

The existing structures on the Grounds were built during periods when hazardous materials such as lead-based paint were used. Since the proposed action may involve altering these structures in some manner, hazardous materials have the potential to be released. Human exposure to these contaminants may present a health hazard. Therefore, best management practices for working with hazardous materials would be required.

4.1.6 Air Quality

Air Quality Standards

In response to the Clean Air Act of 1970 and the Clean Air Act Amendments of 1977 and 1990, the U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for the protection of human health and welfare. Current NAAQS are set for carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), particulate matter equal to or less than 10 microns in size (PM_{10}), and fine particulate matter ($PM_{2.5}$). The EPA assesses the status of compliance with the NAAQS for geographic regions specified throughout the United States. Regions that meet the NAAQS are called "attainment areas," while regions that do not meet the NAAQS are called "nonattainment areas." Areas that have been reclassified from nonattainment to attainment status are called "maintenance" areas.

Air Quality Conditions

The proposed action would be located within the National Capital Interstate Air Quality Control Region (NCIAQCR). This region includes Washington, DC; Montgomery, Prince George's, Calvert, Charles, and Frederick counties in Maryland; Arlington, Fairfax, Loudoun, Stafford, and Prince William counties in Virginia; and the City of Alexandria in Virginia. While the region has been designated by the EPA as a "serious non attainment area", it meets the NAAQS for all other air pollutants. Air pollutant concentrations are measured at monitoring stations throughout the NCIAQCR to evaluate the air quality of the area and to determine compliance with the NAAQS. Ambient air monitoring is conducted in accordance with EPA-approved methodologies, standard operating procedures, and quality assurance procedures. In order to achieve attainment with the NAAQS, the region submitted a State Implementation Plan (SIP) with yearly updates the details air pollution Control measures such as stationary and non-highway source controls, vehicle inspection and maintenance programs, and transportation control.

General Conformity

The Clean Air Act Amendments of 1990 require the USEPA to promulgate rules to ensure that Federal actions conform to the appropriate SIP. These rules are known together as the General Conformity Rule (40 C.F.R. §§ 51.850-860 and 40 C.F.R. §§ 93.150-160). The General

Conformity Rule requires any Federal agency responsible for an action in a nonattainment area to determine that the action is either exempt from the General Conformity Rule requirements or that the action conforms to the applicable SIP. The conformity assessment process is intended to ensure that Federal agency actions: (1) will not cause or contribute to new violations of National Ambient Air Quality Standards (NAAQS); (2) will not increase the frequency or severity of any existing violations of ambient air quality standards; and (3) will not delay the timely attainment of ambient air quality standards. There are approximately 30 presumptive exemptions established and available in the General Conformity Rule. In addition, an agency may establish that the projected emission rates would be less than specified emission rate thresholds, known as *de minimis* thresholds, and that the emissions would be less than ten percent of the area emission budget. If these conditions are met, then the requirement to demonstrate conformity is not applicable, i.e., conformity of the project is presumed.

Air Pollution Sources

In the greater metropolitan Washington, D.C. region, automobile traffic is a significant contributor to air quality problems. Automobiles are principal sources of CO, as well as the source of hydrocarbons and nitrogen oxides, which react in the atmosphere in the presence of sunlight to form O_3 and other photochemical oxidants, the components of “smog.” It is difficult to associate O_3 levels with a particular traffic-producing project, because ozone is not emitted directly, but is produced over time, and is dependent on weather conditions. O_3 levels are highest in the summer under stagnant air conditions. CO, conversely, is emitted directly and concentrates locally around heavily traveled roadways and congested intersections. CO levels can be more directly attributed to local traffic levels. CO levels tend to be highest in the winter when cold weather causes automobiles to burn gas less efficiently.

4.1.7 Noise Levels

Terminology

Noise is generally defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance and, in the extreme, hearing impairment. Most environmental noise includes a conglomeration of frequencies from distant sources, which create a relatively steady background noise in which no particular source is identifiable. Human hearing is less sensitive at low frequencies and extremely high frequencies than at mid-range frequencies. Therefore, a method called “A-weighting” is used to filter noise frequencies that are not audible to the human ear.

Noise levels are usually measured and expressed in decibels (dB). All sound levels discussed in this section are A-weighted and therefore are called the A-weighted sound level (dBA). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling a traffic volume, would increase the noise level by 3 dBA; a halving of the energy would result in a 3 dBA decrease. Typical noise levels for common outdoor and indoor activities are shown in Table 4.1.7-1.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of frequencies from distant sources, which create a relatively steady background noise in which no particular source is identifiable. Average noise levels over a period of minutes or hours are usually expressed as dBA L_{eq}, or the equivalent noise level for that period of time. The period of time average may be specified; $L_{eq}(3)$ would be a three hour average; when no period is specified, a one hour average is assumed. Construction noise standards are typically stated as average noise levels over a period of 1, 8, or 12 hours.

Noise standards for land use compatibility are established by various agencies and jurisdictions. A person may not cause or permit noise levels that exceed noise standards. Construction and demolition, pile driving, and blasting during daylight hours are activities that are exemptions to these prohibitions.

Through its Noise Control Regulations (Municipal Regulation Title 20, Chapters 30 and 31), the District of Columbia has established maximum permissible sound levels for any sound that emanates from an operation, activity, or noise source at the property line of the site on which the noise source is located. Construction noise levels are addressed in Title 20, Chapter 30, Section 3004.2 of the D.C. Municipal Regulations which states that "individual pieces of construction equipment shall be exempt at all time. They shall operate so as to comply with the noise limits established in 3102 of this title." Section 3102 requires that from 7:00 a.m. to 7:00 p.m. on any weekday, construction and demolition noise levels (excluding pile drivers) shall not exceed 80 dB(A) Leq unless granted a variance. From 7:00 p.m. to 7:00 a.m., maximum noise levels of 55, 60, and 65 dB(A) apply for residential, commercial, and industrial, respectively, with no averaging time period specified. For construction noise, measurements shall be made 25 feet from the outermost limits of the construction site. No permit for construction or demolition shall be issued until the permit applicant provides written documentation that construction noise will comply with District noise regulations.

Noise Sensitive Receptors

Noise sensitive receptors are generally considered to be human activities or land uses that may be subject to the stress of significant interference from noise. Land uses associated with sensitive receptors include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, education facilities, and libraries. Sensitive receptors may also include threatened or endangered noise sensitive biological species.

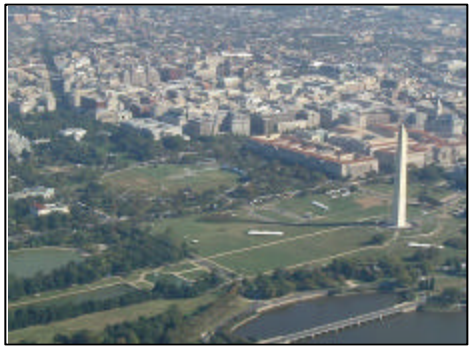
There are no noise sensitive receptors currently on the project site. The off-site noise sensitive receptors of concern in the project region are the inhabited buildings in the vicinity of the construction and the roadways that would carry the greatest volumes of construction-related vehicle traffic.

Table 4.1.7-1 Typical Noise Levels

Common Outdoor Activities	Noise Level dBA	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 1,000 feet (300 meters)		
	--100--	
Gas Lawn Mower at 3 feet (1 meter)		
	--90--	
Diesel Truck at 50 feet (15 meters), at 50 mph (80 km/hr)	--80--	Food Blender at 3 feet (1 m) Garbage Disposal at 3 feet (1 meter)
Noisy Urban Area, Daytime		
Gas Lawn Mower, 100 feet (30 meters)	--70--	Vacuum Cleaner at 10 feet (3 meters)
Commercial Area		Normal Speech at 3 feet (1 meter)
Heavy Traffic at 300 feet (90 meters)	--60--	
		Large Business Office
Quiet Urban Daytime	--50--	Dishwasher Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference
Quiet Suburban Nighttime		Room (Background)
	--30--	Library
Quiet Rural Nighttime		Bedroom at Night, Concert
	--20--	Hall (Background)
		Broadcast/Recording Studio
	--10--	
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans 1998.

4.2 CULTURAL RESOURCES



The setting for the Washington Monument includes its Grounds, the National Mall, West Potomac Park, and the Ellipse.

This section details the archaeological, historic, and cultural resources present on the Washington Monument Grounds and the study area. The information was derived by examining various historical documents, including the National Register of Historic Places nomination form for the Washington Monument, the Historic American Building Survey (DC-349) for the Washington Monument, and additional historical narratives from books and internet sites. For the purposes of this section, the Area of Potential Effects (APE) is defined as the boundaries of the Washington Monument Grounds, as well as West Potomac Park, the Ellipse, the National Mall, and the L'Enfant Plan.

4.2.1 Archaeological Resources

Prior to the construction of the Monument Grounds, the marshy nature of the topography would have restricted most prehistoric occupation to higher ground. Prehistoric use of the area by semisedentary agriculturalists is unlikely since the soils are hard silty clays lensed with silty sand and are not conducive to slash-and-burn subsistence cultivation. Prehistoric use would most likely have focused on exploitation of waterfowl and marshy plants, which are activities that would have resulted in short-term hunting/gathering sites.

With the construction of the Monument, evidence of prehistoric occupation on the high ground would likely have been destroyed by excavations for the Monument's foundation or buried under well-vegetated fills. Given that the proposed excavations will not go below the historic circa 1878 grade, the potential for encountering archaeological resources listed on the National Register is extremely low.

However, there may be archaeological sites below the project area or outside of the project area bounds. There are references to the Washington Monument Grounds as a prehistoric site from the late archaic period (2000-1000 BC). The general area yielded 147 artifacts, including flakes, chips, a half-grooved axe, and projectile points.

4.2.2 Historical Resources

There are several historic resources located within the APE for the Washington Monument. The resources listed in the National Register, which include buildings, land areas, and physical plans, are identified in Table 4.2.2-1. The most relevant of these resources are described on the following pages.

View from the top of the Monument east to the U.S. Capitol.

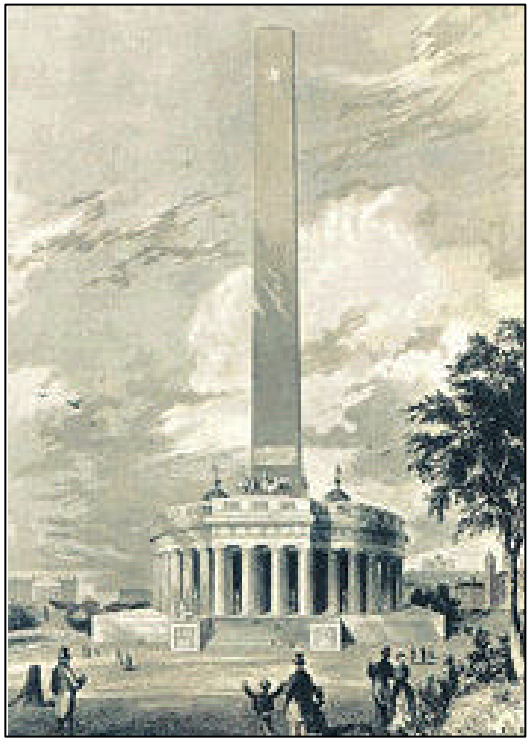
Table 4.2.2-1
Designated Historic Resources

Resource	National Register Designation
Washington Monument	1966
National Mall	1966, 1974, and updated in 1981
Ellipse	Part of 1978 Presidents Park and 1997 L'Enfant Plan designation
West Potomac Park	2001
L'Enfant Plan	1966 and 1997
McMillan Plan	1997 as part of L'Enfant Plan designation

The Washington Monument

The Washington Monument, as the nation's foremost memorial to President George Washington, is one of the most recognizable historic resources in Washington, DC and the United States. It is also the world's largest freestanding stone structure, a major example of Egyptian Revival architecture and a notable accomplishment of 19th-century engineering. The Washington Monument was one of the first historic properties to be listed on the National Register of Historic Places in 1966.

Plans for a national monument to Washington began in 1783, when Major Pierre Charles L'Enfant proposed and the Continental Congress resolved that, "an equestrian statue of General Washington be erected at the place where the residence of Congress shall be established." Although the U.S. Congress authorized this proposal, no action was taken. After Washington's death in 1799, Representative John Marshall proposed that a sculpture to Washington be erected within the Capitol building. However, construction was delayed because of lack of funds and the reluctance of



Robert Mills' neoclassical design of the Washington Monument.

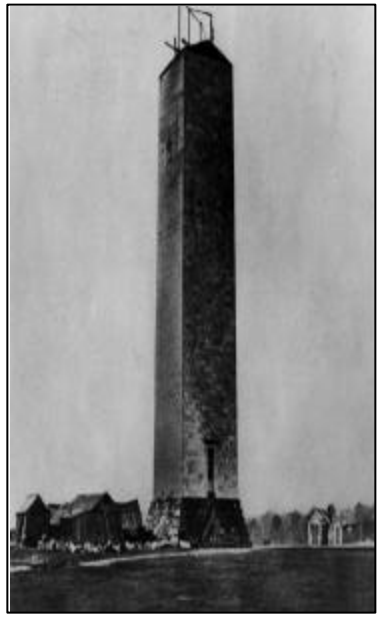
Washington's heirs to move his body from Mount Vernon. Memorialization intensified with the centennial of Washington's birth in 1832, when Congress appropriated $5,000 for a marble statue to be placed in the Capitol Rotunda. A controversial 20-ton, seated, semi-nude, classical figure of Washington was unveiled in 1841 but it did not fulfill the public's desire for a fitting tribute. Eventually the statue was moved to the Smithsonian in 1908.

In 1833, former Librarian of Congress George Watterson formed the Washington National Monument Society to renew interest in the project. The Society, which was later led by John Marshall and James Madison, raised over $28,000 and announced its intention to erect a monument "whose dimensions and magnificence shall be commensurate with the greatness and gratitude of the nation which gave [George Washington] birth [and] whose splendor will be without parallel in the world." The Society initiated an architectural design competition in 1836, which prominent architect Robert Mills won with a plan to "harmoniously lend durability, simplicity, and grandeur." As Assistant Architect of the Capitol, his landscape designs for the Mall feature the Washington Monument as the focus of picturesque gardens and winding pathways.

Mill's neoclassical design proposed a 600-foot tapering, nearly flat-topped obelisk, with a single star near the apex to represent Washington's immortality. A circular colonnade pantheon, 250 feet in diameter and 100 feet high, would surround the obelisk at its base. The design proposed that a classically inspired statue of Washington driving a chariot would stand on the colonnade and 30 statues of Revolutionary Way heroes would be displayed in the niches between the columns. Other features included friezes with state seals and frescoes and paintings of battle scenes. The base of the colonnade would also include a museum and archives. Mills hoped that George Washington and other heroes would be entombed in subterranean catacombs. The Society never formally accepted the elaborate designs for the base of the Monument, but instead concentrated on fundraising for the building of the shaft, which was estimated at $1,000,000.

In 1848, Congress donated 37 acres of land for the proposed monument. The Monument's cornerstone was laid during a Fourth of July ceremony that same year. An estimated crowd of 20,000, including President James K. Polk, George Washington Parke Custis, Dolley Madison, James Buchanan, Andrew Johnson, and Congressman Abraham Lincoln, witnessed Masonic rituals and a fireworks display.

Construction continued under the direction of Superintendent William Daugherty until 1854, when funds were exhausted. In 1855, Congress voted to appropriate $200,000 to continue construction; however, the funds were rescinded when the Know-Nothing political party illegally gained control of the Washington National Monument Society. Although the Know-Nothings added three courses of masonry to the Monument, these courses were made of inferior marble and were later removed. In 1858, the Know-Nothings returned records and control of the Monument's construction to the Society. The Civil War and subsequent lack of funds further delayed construction; the Monument stagnated at 156 feet for 20 years.



The Monument under construction.

As the war came to a close, the nation struggled to become a Union again. The abandoned Washington Monument, standing among the debris of cattle pens, trampled Grounds, and broken stones, characterized what war had done to the country. Once a symbol of Washington's accomplishments and hope for the young country's future, it was looked upon as an object of embarrassment. However, the National Centennial in 1876 renewed public interest in completing the Monument. In his second term of office, President Ulysses Grant signed and Congress passed a bill for $2,000,000 to complete the structure. The Society turned the monument and Grounds over the government and construction resumed in 1878 under the direction of Lt. Colonel Thomas L. Casey of the US Army Corps of Engineers. Casey altered Mills' original design and proposed an unadorned Egyptian obelisk with a pointed pyramidion, which was compatible with the popular 19th Century Egyptian Revival style.

The U.S. Army Corps of Engineers determined the foundation to be inadequate to support the weight of the total Monument and, subsequently, enlarged it in 1878. A steam-powered elevator was installed to help lift the blocks of marble up to the work areas as the project climbed higher and higher. On December 6, 1884, the 3,300-pound capstone was placed at the top and was crowned with a 9-inch-tall aluminum pyramid. At this time, the aluminum pyramid was the largest piece of aluminum ever cast. The Monument was dedicated on February 21, 1885 by President Chester A. Arthur. However, the Monument did not open to the public until October of 1888, 40 years after the cornerstone was laid and more than 100 years after a monument to George Washington was proposed. During the 3-year period between the dedication and the admission of the public, the stairwell was finished, the elevator platform was converted to a passenger car, lightning rods were installed, and a lighting system was incorporated into the stairwell. Congress shifted control of the

The 1998 restoration of the Washington Monument.

Monument and its staffing to the War Department, with the Washington National Monument Society in an advisory role.

Routine maintenance was performed on the Monument during the 1900s. In 1998, a comprehensive restoration project was initiated. The Washington Monument Restoration Project (1998-2002) included repair and repointing of the exterior stones, replacement of the windows, repair of the lighting protection system, repair and cleaning of the commemorative stones in the stairwell, and installation of sensors on the exterior to detect future damage. The project upgraded the heating and air-conditioning systems, upgraded the elevator's mechanical systems, and installed new cables and safety devices. The observation deck at the 500-foot level and the 490-foot level were remodeled, which involved putting in new flooring, walls around the elevator, a new lighting system, an improved air conditioning system, and a new glass protection system around the marble walls and buttresses. New exhibits were installed on the 490-foot level. New and larger pictures of the city were placed over each window of the observation deck to identify landmarks.

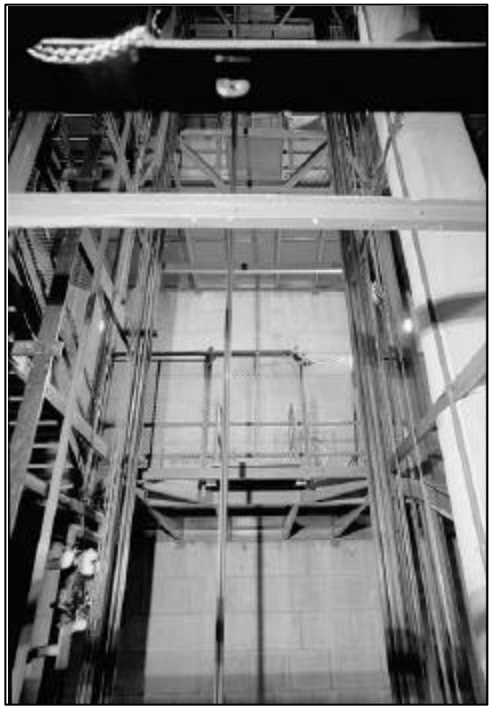
The Structure and Its Engineering

One of the commemorative stones which line the Monument stairwell.

The Washington Monument is a notable accomplishment in structural engineering for its period. The Monument stands 555 feet, 5-1/8 inches tall; 500 feet constitute the shaft, while the remaining feet form the capping pyramidion. The shaft tapers from a base width of 55 feet, 1-1/2 inches to a width of 34 feet, 5-1/2 inches at the 500-foot level. The walls range in thickness from 16 feet at the base to 18 inches at the upper shaft. The Monument’s original 156 feet were made of white marble from Texas, Maryland. However, several blocks of white marble from Massachusetts were added to the original structure and the rest of the Monument was made of white marble from a quarry in Baltimore County. The discoloration on the exterior sides clearly marks the older structure from the later one. Since the marble came from three different quarries, it did not weather the same; therefore, it was impossible to match the later marble to the older perfectly. Granite from Maine reinforces the interior walls up to the 452-foot level; from there to the top, the walls are marble.

Interior: Interior ironwork helps supports the entire Monument. A flight of 896 interior steps rises to the observation area in the pyramidion. There are 195 commemorative stones, donated by various states, Native American nations, private organizations, and foreign countries, set in the walls along the stairway. Many stones have been restored.

Elevator: The stairs encircle a central elevator shaft. When the Monument opened in 1888, the first elevator was a steam hoist, which was used until an electric elevator was installed in 1901; this elevator could run to the top in 5 minutes and carry 35 passengers. Another elevator was installed in 1926. In 1959, a new elevator was installed to ascend and descend in 60 to 70 seconds and carry 25 passengers. In 1998, a new elevator control panel was installed that enabled the elevator to ascend and descend in 60 seconds. A new elevator cab with glass doors to view the commemorative stones and a capacity of 25 passengers was installed in 2001.



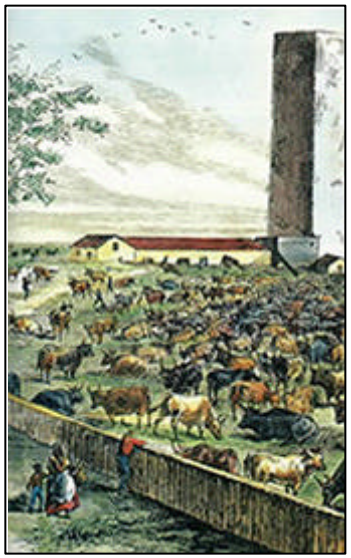
The Monument elevator shaft.

Observation Deck: The viewing area contains two windows on each side; the windows on the east are larger for exterior access. The windows were originally unglazed and could be closed using interior shutters that swung flush with the surface. In 1926, metal bars were hinged above each window on the inside. In 1959, the bars were replaced by safety glass panels, which were flush with the exterior masonry at the sills but projected at the window heads. Under certain light conditions, the projections cast shadows and made the windows appear larger than they are. The interior shutters remained until the installation of protective glass wainscoting on the interior walls in 1975.

Safety: In 1885, a system of lightning conductors was installed on the aluminum capstone at the tip of the Monument. In 1929, searchlights to outline the top of the Monument to air traffic were installed. In 1931, aircraft-warning lights were hung from the observation windows to replace the searchlights. In 1958, warning signals were positioned above the windows for better visibility. In addition, floodlights were installed on the Grounds to light the Monument against the night sky.

Visitor Comfort: In 1904, a lobby was developed with mosaic and marble wainscot flooring, electrical lights, steam heating, and four oak settees for visitor comfort during their wait for the elevator. In 1972, revolving glass doors were installed at the eastern end of the entrance corridor but were replaced by standard glass doors 2 years later. In 1976, a wheelchair access ramp to the elevator was added, eliminating the outside step into the Monument.

Monument Grounds and Other Contributing Elements



Cattle on Grounds during Civil War

The Monument and its landscaped Grounds are central to the Monumental Core of the Nation's Capital and are anchors of the National Register-designated L'Enfant and McMillan Plans for Washington D.C. While the Monument Grounds have been altered significantly since the Monument's construction, the basic "grassy mound" is extant today and is an important feature in the overall rolling landscape of the Monumental Core. The obelisk sits atop a smooth hill, or grassy mound, that is balanced by informal plantings, gentle curves, and asymmetrical edges. The Monument's placement in the gently sloping lawn provides a fitting contrast for its singular geometric mass.

When Charles Pierre L'Enfant set aside the site for the Monument in his 1791 Plan, it was at the edge of the Potomac River. The entire National Mall area was used as grazing and agricultural lands. During the Civil War, the Monument Grounds were a drilling field for Union troops. Fencing was placed around the perimeter of the Grounds to contain herds of cattle, which were intended to feed the Union Army. Sheds were built on the Grounds to store hay and a slaughterhouse was located nearby.

After the Monument's dedication in 1885, elaborate plans for terracing the Grounds were proposed, such as an ornamental retaining wall connected to a tiled esplanade by two broad double stairways. However, they were abandoned in favor of a simpler landscaping project that proposed to deposit fill from the creation of East Potomac Park around the Monument to cover the foundation, bring the Grounds up to grade and let the earth slope gradually away from it on all sides. Paths were laid out, trees and shrubs were planted, and the entire grassy mound was completed in 1888. When the Monument was dedicated, marshland bordered it to the south and west; however, land that had previously been inundated by the Potomac River began to be reclaimed at the turn of the century.

The Grounds have changed as the cultural and political climate of the nation's capital dictated. In 1890, a statute provided for construction of children's playgrounds on the Washington Monument Grounds to mitigate undesirable residential conditions in the city. Early in the century, baseball diamonds and tennis courts covered portions of the Grounds. During World War II, temporary military installations were built west of the Monument but were removed shortly after the war. Over the years, NPS maintenance facilities have come and gone and the configuration of roads and

pathways to the Monument has changed. In previous years, cars were able to park at the base of the Monument. Cars presently use the parking lot, which most likely was constructed to serve the military installations nearby during World War II, that is located northwest of the Monument off of Constitution Avenue.

Elements of the Monument Grounds that are contributing elements to the National Register include:

Survey Lodge: The Survey Lodge is located approximately 750 feet southwest of the Washington Monument and is a contributing resource to the Grounds. William Bradley constructed the Survey Lodge in 1886 using leftover granite and marble from the Monument. The structure originally contained boilers that produced steam, which was piped underground to power the Monument's elevator. It is a small, one-story structure, square in plan. A five-step main entrance, which is situated under a shallow projection with a gabled peak, is located on the western end of the building's north side. Two windows are set back and located 2 feet from the gabled end. This pattern of two windows and a gabled entrance is repeated on the building's eastern side. However, the eastern side also has a closed-off opening by the door. The west wall has four windows but no entrances, while the southern wall has no windows or entrances. The interior of the building has been partitioned into various offices and serves as the NPS Ranger Station for Mall Operations. The basement, which once housed boilers, now is used for storage.

Survey Lodge.

Monument Lodge (Marble Lodge): The Monument Lodge, which is located approximately 480 feet east of the Washington Monument, is a contributing resource to the Grounds. The small, one-story, flat-roofed structure was built in 1888 using leftover granite and marble from the Monument. This building was built as the home for the Monument custodian and as storage for the Society's records. It also provided restroom facilities for visitors who met there before walking to the Monument.

Monument Lodge.

The Lodge is rectangular in plan, measuring 43 feet by 24 feet with a polygonal central bay on the western side. A 21-foot central porch is located on the eastern side and extends 2½ feet out from the wall. This porch is recessed into the front wall, faced with yellow brick, flanked with windows, and screened by two marble Doric columns in-antis. The front door is 6 feet wide. In addition to the two windows on either side of the porch, one casement window is located on either end of the eastern side and placed high in the wall above plain stone panels. Shrubbery conceals the stone panels and the decorative pilasters applied to the central mullions and side sashes. The Lodge was

remodeled in 1931, 1942, and in 1963, when a large cinderblock lean-to addition was attached to the west wall. Today, the Lodge is used as a restroom, snackbar, and souvenir shop. An aluminum awning is added to the structure in the summer. This addition and awning partially conceal the polygonal bay and detract from the historic qualities of the structure.

View from the west to Monument plaza.

Washington Monument Flags: The Washington Monument Flags are a contributing resource to the Washington Monument Grounds. In 1937, 48 temporary wooden flagpoles displaying American flags – one for every state in the Union - were arranged in a circular colonnade around the Monument for special events and George Washington's birthday. In 1959, the wooden staffs were replaced by 50 permanent poles; the poles are grounded in concrete and stand approximately 24 feet tall. Today, the circle of flagpoles helps define a precinct around the Monument and provides a scale reference.

Jefferson Pier Marker: This small monument, a contributing resource to the Washington Monument Grounds, is located 371.6 feet west and 123.17 feet north of the Washington Monument. This monument marks the site that the L'Enfant Plan had set aside for the Monument – the spot where the east-west axis of the Capitol intersects with the north-south axis of the White House. The original stone was placed in 1804, during Thomas Jefferson's presidency to mark the location of a planned "National Meridian Line," similar to the Prime Meridian Line passing through Greenwich, England. The marker later functioned as a benchmark for the Monument, a survey point for the city's land plats, and as a mooring post for the old canal until it was leveled and used for the bed of a nearby road. The foundation was infilled with dirt and virtually forgotten until 1889, when the site was rediscovered and a 2-foot by 2-foot block of granite was erected on the original foundation. Today's marker stands 3 feet, 3 inches tall and is inscribed with "Position of Jefferson; Pier erected Dec 18,1804; Recovered and re-erected; Dec 2, 1889; District of Columbia."

Other elements and structures on the Washington Monument Grounds include:

Bulfinch Gatepost: A gatepost designed by Charles Bulfinch for the U.S. Capitol Grounds is located near the northeast corner of the Monument Grounds. The Gatepost was listed on the National Register in a separate nomination. Although it is not considered a contributing resource to the Register-designated Washington Monument Grounds themselves, the Gatepost is an important historic resource.

Sylvan Theatre: The Sylvan Theatre complex is located in a small depression, 150 yards south-southeast of the Washington Monument near Independence Avenue. The complex is not considered historic and is not a contributing resource to the National Register-designated Washington Monument site. In 1917, the first theatrical facility was erected on the site; it was an earthen platform surrounded by shrubbery, with landscape contours forming a natural viewing area for the stage. By 1944, a stage structure existed on the site. The present theatre is an open-air theatre approximately 60 feet long, 40 feet wide and 40 feet tall. The rectangular stage sits 4 feet above ground level and can be reached by steps in the front. The façade is dark brown wood and the interior is painted black. Shrubbery serves at the backdrop and iron girders support the edifice. A large green light boom frames the stage. This facility is used for numerous special events and activities, including the annual NPS Independence Day celebration.

Sylvan Theatre.

After 1966, four brown, tin, flat-roofed buildings were erected adjacent to the sides of the theatre. The two larger buildings are used as dressing rooms. They are 35 feet by 15 feet in size and 10 feet tall, with one entrance on the south side and two entrances on the side facing the stage. The two smaller buildings are between the larger buildings and the stage; one building is an electrical center and the other building is a storage room. A large, circular restroom is located to the rear of the theatre. The other restroom is a green, metal portable station; it is located 100 feet west of the theatre and used on special occasions. A major renovation of the complex occurred in 1976; consequently, the facility is not considered historic.

Historic Plans and Development of the National Mall

In the earliest plans for the city, the area from the Capitol to the present site of the Washington Monument was intended as parkland. George Washington established the original boundaries of the National Mall on March 2, 1792. In 1820, Congress granted the first Mall site to the Botanic Gardens and another site to the Smithsonian Institution in 1846. As interest in the Mall grew, plans for beautifying the Mall continued until the onset of the Civil War, when the area became inundated with troop encampments and cattle yards. In 1871, the Baltimore and Potomac Railroad Company constructed a depot on the Mall, and from 1882 until 1908, dredging and fill operations created East Potomac Park and West Potomac Park.

At the turn of the century, the Mall's appearance was becoming more stable. In 1901, the McMillan Commission proposed restoration of the Mall and accepted the original L'Enfant Plan as the foundation of the city's development. Starting in 1933, NPS received jurisdiction over the public buildings and reservations formerly administered by the Director of Public Buildings and Public Parks of the National Capital.

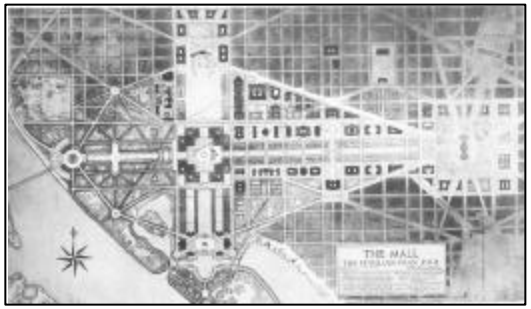
1791 L'Enfant Plan of the District.

L'Enfant Plan of 1791

L'Enfant's Plan of Washington, DC is the sole American example of a comprehensive Baroque city plan with a coordinated system of radiating avenues, parks, and vistas overlaid upon an orthogonal grid of streets. The Plan defines the physical and symbolic character of the nation's capital city through its arrangement of buildings, structures, and views. L'Enfant's Plan dictated that a monument to Washington should be built where the east-west axis from the Capitol along the National Mall to the western horizon intersects with the north-south axis from the White House to the southern horizon. When construction began in 1848, however, the site was determined to be marshland and the Monument was consequently erected 351.6 feet east and 123.17 feet south of the intersection. L'Enfant also intended the National Mall to be the site of ambassadorial residences. The L'Enfant Plan was listed on the National Register in 1966 and on the DC Inventory of Historic Sites since 1964. The National Register nomination for the L'Enfant Plan was updated in 1997 to include the features created with the implementation of the McMillan Plan.

McMillan Plan of 1901

The Senate Park Commission of 1901, known as the McMillan Commission, expanded the L'Enfant Plan to create the most elegant example of City Beautiful tenets in the nation. The Commission successfully removed the railroad tracks from the Mall and extended the Mall axis 1 mile to the west to create a site for the Lincoln Memorial.



1901 McMillan Plan of the District.

The McMillan Plan intended to reconcile the relocated Washington Monument with the L'Enfant Plan geometry and its original siting for the Monument, as well as reserve the Monument Grounds for public enjoyment. The McMillan Commission proposed that the Monument be flanked by formal, sunken gardens to the north and south; to the west, the design proposed a 300-foot-wide marble staircase that descended 40 feet from the platform to an oval pool and another formal sunken garden. The Monument's reflection in the oval pool would create the illusion that the Monument had been realigned with the north-south axis from the White House. While the design would have fulfilled the desired geometric integrity of L'Enfant's Plan, structural concerns and costs led the commission to abandon the proposed redesign. The features implemented from the 1901 McMillan Plan are National Register-designated resources included in the 1997 nomination of the L'Enfant Plan.

A development plan for the Mall was put forth in 1933 by Harold Ickes, Secretary of the Department of Interior and Administrator of the Public Works Administration, to improve the water services, transportation flow, and design in accordance with the L'Enfant and McMillan Plans. The plan encompassed the Mall Union Square, and the plot of land joining the Mall and the Capitol Grounds and built upon the guidelines prepared by Frederick A. Delano, and other commissioners according to their interpretations of what L'Enfant and McMillan would have advocated for the Mall. This vision included an open vista between the Capitol and Washington Monument with the removal and replanting of trees, grading of the landscape, and a geometric organization of public buildings.

Rendering of the McMillan Plan.

Recent Plans

The 1966 National Mall Plan sought to maintain the integrity of the principal east-west axis of the L'Enfant Plan through formalized settings. The 1973 Comprehensive Design Program for a

The 1998 Monument Restoration

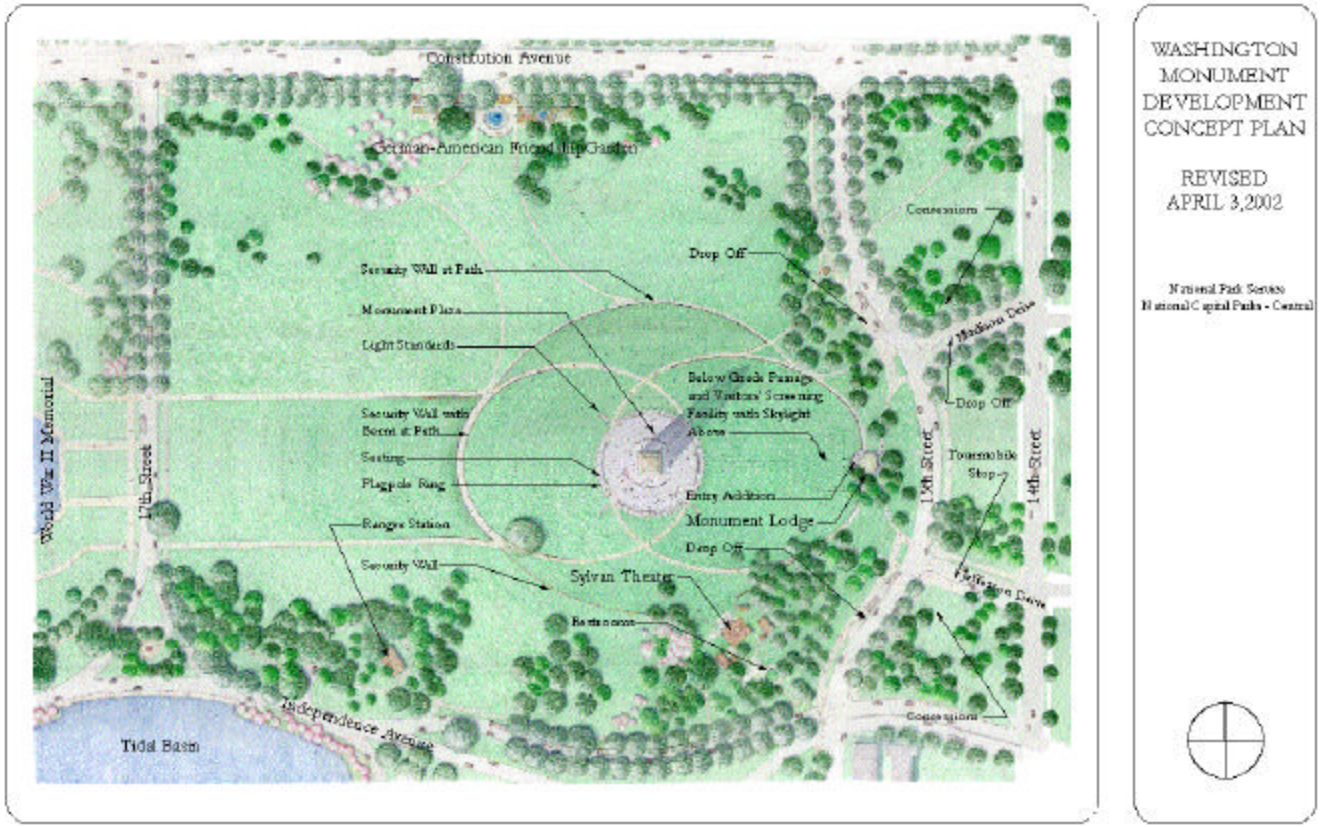
Proposed Visitor Facility proposed an underground structure aligned in a generally symmetrical fashion around the Monument and connecting via a ramped underground passageway to a below-grade elevator landing.

In 1981, the DCP recognized that "design continuity is lacking, graceless and unsymmetrical features diminish visual quality, and modern structures and facilities intrude on vistas and detract from the site's integrity" and incorporated the best of the previous plans to define the Grounds to be compatible with other parts of the Monumental Core. In 1982, the 1981 DCP was modified to add landscape improvements and above-ground buildings. A 1986 Plan, which included an above ground concession building in the viewshed, was rejected by Federal review agencies. The 1981 DCP was further modified in 1989; this DCP recommended four principal proposals: (1) visitor services would shift from the Monument base to buildings in the Sylvan Theatre area; (2) the Monument Plaza would not accommodate a large seating area but instead would have a grassy area for passive use; 3) 15th Street, Madison Drive, and Jefferson Drive would be realigned; and (4) the Monument Lodge would be restored to its original 1888 appearance.

The 1993 DCP further modified the 1989 DCP by proposing restoration and adaptation of the Monument Lodge as the entrance to a new underground visitor facility and walkway modifications to meet universal accessibility. Various elements of the DCP have been realized, such as the realignment of 15th Street (and Madison and Jefferson Drives), improvement of walkways connections of the east side of the Grounds, and the relocation of the tourmobile stops along 15th Street out of the National Mall viewshed. Other elements remain to be completed, such as restoration and adaptation of the Monument Lodge as a portal to the visitor facility, various walkway modifications, improvements to the plaza at the Monument's base, removal of the 16th Street parking lot, and completion of the German-American Friendship Garden. In 2002, the DCP was modified to reflect the Olin Partnership design concept approved by the NCPC and CFA (Figure 4.2.2-1).

Regardless of their design nuances, the various iterations of the DCP have maintained the spirit of the L'Enfant Plan by maintaining the primary structures and monuments "as dominant elements in the landscape" and fitting the plan to the site's topography. The plans accommodate modern needs within the "goals of preserving and enhancing important vistas, ensuring harmony and continuity with adjacent monumental areas, and enhancing the quality of the visitor experience."

Figure 4.2.2-1
2002 Modified DCP



WASHINGTON MONUMENT DEVELOPMENT CONCEPT PLAN

REVISED APRIL 3,2002

National Park Service
National Capital Parks - Central

4.2.3 Cultural and Ethnographic Resources

An event on the National Mall.

The Washington Monument Grounds is considered a cultural landscape. The open space and parklands of the Grounds and the Monumental Core area create a highly visible stage for public expressions of remembrance, celebration, and protest. Although the land uses and functions of many buildings of the Monumental Core and National Mall area have departed from L'Enfant's intent, the building of the Washington Monument itself helped retain the open space for use as a place for public assembly and recreation.

Since the Monument's dedication, it has gained historical significance as a focal point for public gatherings. In 1887, National Guard forces converged on the Washington Monument Grounds to compete in friendly drills and competitions. During the Spanish-American War, troops stopped to rest on the Grounds' green slopes before proceeding to Cuba. In both World War I and World War II, the broad grassy knoll served as a parade ground and assembly field. The Grounds also hosted a large Bond Rally in 1945; 350,000 people congregated in the area to view fireworks and to watch performances by movie stars.

The Monument Grounds provide a natural forum for patriotic events. For example, the Grounds were the site of a Bicentennial celebration in 1976; half a million people crowded the Grounds for concerts, picnics, and fireworks. The celebration is continued every Fourth of July, when spectators flock to the Grounds and the National Mall for one of the nation's largest celebrations. On Washington's Birthday in February, various patriotic groups gather to lay wreaths and make speeches about George Washington. In the summer, the Sylvan Theatre presents military concerts and award ceremonies.

The Mall and the Monument Grounds have a long tradition of hosting public demonstrations. Americans worked on the Mall in temporary buildings during World War II; the Vietnam War attracted protestors who used the Lincoln Memorial and Monument Grounds to express opinions; and the historic 1963 March on Washington transformed the Mall into the stage for Civil Rights demonstrations. The Monument Grounds and National Mall continue to serve as the forum for national debate and public expression today. In 2001, NPS granted more than 3,000 permits for public gatherings or demonstrations on parklands in the Monumental Core of Washington, DC.

In addition to patriotic events and public demonstrations, the Monument Grounds host a diverse array of activities, festivals, concerts, and cultural and recreational events throughout the year. For example, the Grounds host the Smithsonian Kite Festival and some of the Cherry Blossom Festival events in late March or early April. During the summer, the annual Folklife Festival, which showcases music, dance, celebratory performance, crafts and cooking demonstrations, storytelling, and narrative sessions for discussing international cultural issues, is held nearby on the National Mall. Throughout the summer, informal softball games are played on the Grounds. In early September, the National Frisbee Championship is held on the Grounds. Since some events require large open areas for the event and associated tents and stages, these events normally occur in the flatter topography north and west of the Monument itself.

U.S. Army Band Concert at the Sylvan Theatre

4.2.4 Visual Resources

Visual Characteristics of the Site

The Monumental Core of Washington, DC.

The Washington Monument site is located within the Monumental Core where the axis of the Capitol Building and the Lincoln Memorial intersect with the axis of the White House and the Jefferson Memorial. The site currently has a scattering of permanent historic structures and a landscape that is rolling and park-like.

The close-in portions of the Washington Monument Grounds are bounded on all sides by streets. Constitution Avenue to the north, Independence Avenue to the south, and 14th Street to the east are major pedestrian and vehicular traffic routes. Another major pedestrian and vehicular route for north-south traffic that bisects the Grounds is 15th Street. The western boundary of the Washington Monument Grounds is 17th Street, which terminates where it meets Independence Avenue at the Tidal Basin; it receives moderate use of about 30,000 cars per day.

View Eastward to the U.S. Capitol with jersey barriers in foreground.

A handful of built structures exist on the Monument Grounds. The most prominent structure is the Washington Monument itself. It is located towards the center of the Grounds, a few hundred feet east of the exact intersection of the monumental axes. A circle of flagpoles defines the plaza at the foot of the Monument. To the east of the Monument along the axis to the Capitol lies a small stone building known as the Monument Lodge, which provides food service, a gift shop, and restrooms. The Sylvan Theatre is located to the south of the Monument Lodge in the southeast corner of the Monument Grounds. The Survey Lodge is located to the southwest of the Monument and houses the NPS Ranger Station. A Bulfinch Capitol Gatepost is located at the intersection of 15th Street and Constitution Avenue. The Jefferson Pier Marker is situated in the location of the intersection of the monumental axes. A ticketing kiosk can be found along 15th Street north of the Monument Lodge. As an emergency security measure, NPS has installed temporary security barriers and a temporary visitor screening facility at the east entry of the Monument base.

The Monument sits atop the crest of a grassy mound. The land gently slopes to all sides. In a circular formation at the top of the mound, the temporary security barriers are currently located at a distance of 200 feet from the Monument. The concrete jersey barriers unfortunately detract from the Ground's visual integrity by interrupting the simplicity of the gentle slope around the

Monument. Within the circle of barriers and radiating about 80 feet from the Monument's base is an exposed aggregate and asphalt plaza from which visitors can see the dramatic views and vistas to the Monumental Core. The plaza area is flat and uneventful since it once served as a roadway. A concrete curb acts as the plaza's edge.

Beyond the plaza, the concrete jersey barriers, and the grassy mound, the existing landscape around the Monument Grounds includes formal street trees of multiple elm species. The trees are located along 17th Street and Constitution Avenue with a gap in the 17th Street trees along the axis to the Lincoln Memorial. Trees along Constitution Avenue are aligned in a single row behind the sidewalk fronting the street. The single line of trees along 17th Street, however, is located between the sidewalk and the street. The elm trees along Independence Avenue are aligned opposite each other along the street coupled with informal clustering of mixed species behind. There is no apparent street tree treatment for 15th Street, but it has a clustering of mixed species of trees to the south of the buildings that provide shade to waiting visitors. Along 14th Street, the trees are clustered near Independence and Constitution Avenues. Stands of cherry trees exist to the northwest, and northeast of the Monument, and at the Sylvan Theatre. The landscape directly adjacent to the Washington Monument is primarily a gently sloping lawn hill with a unique mulberry tree stand to the southwest. The German-American Friendship Garden comprises a landscape of low shrubs, perennials, and grasses located along Constitution Avenue and is bifurcated by the entrance to a parking lot on the Monument Grounds.

View from Monument Plaza to the northwest with jersey barriers.

Urban Context

Visible from miles away, the Washington Monument is considered the foremost memorial to George Washington while symbolizing the center of the Monumental Core where it is the most prominent structure upon the largest open space in the heart of the Nation's Capital. The landscape of the Monumental Core on the east-west axis between the Capitol and the Lincoln Memorial has a formal aesthetic quality likened to a French boulevard with its broad linear open space reinforced with allees of elm trees. In contrast, the north-south axis between the White House and the Jefferson Memorial is less linear with more of a park-like characteristic using more organic forms to define visual space.

With the prominence of the Washington Monument and its setting, it is of the utmost importance to consider viewsheds both to and from the Monument, since clear views and vistas can be seen in all directions. From the surrounding urban landscape, the Monument itself is visible from major highways and other various access points into the District of Columbia. Meanwhile, some of the Capital's most dramatic views and vistas are within both the Monumental Core's east-west and north-south axes and are often associated with the Washington Monument.

East-West Axis

View from the Lincoln Memorial across the Reflecting Pool to the Washington Monument.

From the Capitol to the Washington Monument along the east-west axis of the Monumental Core, segmented panels of lawn lay between tree allees and rows of buildings, creating large areas of space frequently used for demonstrations, festivals, and recreation. The view to and from the U.S. Capitol is one of the most stunning and well-known vistas of our nation. From the vantage point of the Washington Monument, one can look toward the Capitol past the expanse of open space defined by the tree and building allees. However, the foreground of this view tends to be dominated by the Monument Lodge. Additionally, on the Capitol side of the Monument, light fixtures distract from the visual integrity of important views both to and from the Monument.

There is a contrasting visual character of the east-west axis between the Washington Monument and the Lincoln Memorial. This portion maintains the allee of elm trees that provides apparent symmetry and balance, yet it is not reinforced by architecture as in the axis to the Capitol. Instead of a central green space, there is a reflecting pool and the future World War II Memorial now under construction. Between the two quadrants that stretch from the Capitol to the Lincoln Memorial, the gently sloping lawn of the Washington Monument Grounds provides an expanse of open space in the east-west axis pattern, recognizing the intersection of the north-south axis. Therefore, views and vistas on the Lincoln Memorial side of the east-west axis are primarily uninterrupted with the exception of the construction activities associated with the World War II Memorial. The visual quality is heightened by the visitor's ability to see the Lincoln Memorial beyond the reflecting pool. This view is of particular interest since it faces the sunset from the Washington Monument.

North-South Axis

The north-south vista between the White House and the Jefferson Memorial, across the Monument Grounds, is extremely special in Washington. It is more subtle than most major vistas but extremely powerful. Trees are carefully pruned to help frame the reciprocal view.

The Monument Grounds act as a threshold to less architectural and more naturalized settings to the north and south. In this corridor, one of the most effective scenes is of the White House and the well-known Ellipse that is its foreground. The south side of the White House is best seen from the high vantage point of the Monument's Grounds.

The southern viewshed between the Washington Monument and the Jefferson Memorial is also of value with its extremely naturalized and organic landscape. The axis to the White House includes the Ellipse, a lawn area that is symmetrical in form, but does not emphasize a linear connection as is apparent in the east-west axes. The axis to the Jefferson Memorial is the most irregular of the four axes. The axis is purely visual due to the Tidal Basin, which impedes travel along the southern axis. There is no apparent symmetry along the southern axis and the traffic patterns of both pedestrians and vehicles bend in the same curvilinear manner of the Tidal Basin.

The Monumental Core and the surroundings of our nation's capital can be fully appreciated through these powerful views and vistas to and from the Washington Monument. These vistas are critical components of the landscape. Additionally, wayfinding at the Monumental Core is also heavily dependent upon the clarity of the views.

View from Monument observation deck north to the White House and Ellipse.

The Eastern section of the Monumental Core with the Tidal Basin in the foreground.

4.3 VISITOR USE AND EXPERIENCE

Monument security screening facility.

The Washington Monument is part of the Monumental Core and is administered by a unit of NPS known as National Capital Parks-Central. The other memorials that are part of the Monumental Core include the Jefferson Memorial, the Lincoln Memorial, the Franklin Delano Roosevelt Memorial, the Vietnam Veterans Memorial, and the Korean War Veterans Memorial. Many visitors to Washington D.C. and the Monumental Core visit these memorials, as well as the Washington Monument.

For the past several years, the Washington Monument has been under restoration. During some of this work, access to the Monument observation deck was closed to visitors. The Monument reopened in February 2002.

The Monument is currently open from 9:00 a.m. to 5:00 p.m. 7 days per week. Between Memorial Day and Labor Day, the Monument is open from 8:00 a.m. to 12 midnight. To visit the interior of the Monument, visitors must acquire a free ticket. These tickets are available daily beginning at 8:30 a.m. (8:00 a.m. in the summer) at the ticket kiosk located northeast of the Monument along 15th Street at Madison Drive. Generally, the tickets for a given day are distributed by 10:30 a.m. although the ticket booth remains open until 4:30 p.m.

Security screening facility, jersey barriers, and U.S. Park Police patrols.

4.3.1 Visitation Patterns

Total visitors to NPS sites in the District of Columbia numbered 28.8 million in the year 2000. Of those visitors, approximately 20 million visited National Capital Parks – Central, which includes the National Mall and the Washington Monument. Visitation to the interior of the Washington Monument was only 185,000 in 2000 because of closures related to the Monument restoration. Prior to the restoration, yearly visitors to the interior averaged 950,000 in 1995, 707,000 in 1996, and 841,000 in 1997. Visitors to the National Mall and the Washington Monument are not expected to increase in 2002, but remain stable, according to NPS estimates. Although visitation to the interior of the Monument is limited to slightly less than 1 million visitors annually due to the capacity of the elevator, free access to the Grounds and the base of the Monument is unimpeded.

Visitor Characteristics

People visiting the Washington Monument are diverse in group size and structure, age, background, and other characteristics. A visitor study, conducted in June 1998 at four national monuments and memorials in Washington, D.C., including the Washington Monument, revealed the following (Littlejohn and Hoffman, 1999):

Visitors queuing up in preparation for security screening for entering the Washington Monument.

- *Group size and structure* – Most visitor groups were families (66%). Group size varied between two people (25%) to three or four people (38%). Large groups (6 or more) represented 21% of all visitors.

- *Age* – The most common age group was children aged 15 years or younger (28%) followed by adults aged 36 to 45 (25%).

- *Number of times at the National Mall* – Over 56% visitors were visiting the monuments and memorials for the first time. Thirty-six percent had visited the sites two to four times.

- *Visitor origin* – Only 7% of visitors were from foreign countries of which the largest percentage was from Germany. U.S. visitors were from California (9%), Virginia (6%), Pennsylvania (6%), Washington D.C., and 45 other states.

Visitors most often walked (75%) to arrive at the Washington Monument and the other memorials, followed by use of the Metrobus or Metrorail (36%) and the tourmobile (17%), noting that more than one form of transportation could be used. These arrivals occurred primarily in the vicinity of the Washington Monument or the Vietnam Veterans Memorial and Lincoln Memorial. The most common reasons for visiting were to see the site, learn about U.S. history, and show friends and relatives the Monument and memorials.

On their visit to the Washington Monument and other nearby memorials, visitors commented that they enjoyed interpretive services that emphasized the historical significance of the site. They also liked the cleanliness, well-maintained appearance, and accessibility of the sites. The importance of the view from the Washington Monument was also mentioned. Some of what visitors liked least

was the lack of parking close to the sites, the amount of walking required, the long wait in lines, and the hot weather.

Visitors to the Washington Monument encounter pathways that need improvement.

4.3.2 Visitor Experience

Access and Orientation

Visitors first begin to experience the Washington Monument and nearby memorials as they plan for their visit to Washington, DC. According to the 1998 visitor survey, more than half (53%) of all visitors relied on friends and relatives who had previously visited the site, 43% consulted a travel guidebook, 21% consulted the newspaper, and 16% checked the internet. Of all visitors, 18 percent received no information prior to their visit.

Once in Washington, DC and in the Monumental Core, visitors use a variety of services to navigate the site and find needed information, including the color site brochures, assistance from ranger staff, the *"Washington: The Nation's Capital"* brochure and map, outdoor maps, and visitor information kiosks. On site at the Washington Monument, NPS rangers provide information to visitors as they arrive for their tours or stop by during their visit to the city. Books and other site information are also available in the Monument Lodge.

Washington Monument Tour

Ticket Kiosk at 15th Street.

Ticketing: Visitors who would like to ascend the Washington Monument must acquire a free ticket specifying a time to ascend. Reservations for tickets may now be made in advance over the internet (http://reservations.nps.gov) or via phone. Those making advance reservation are charged a $1.50 service fee per ticket and a $0.50 handling fee per order. Tickets are either mailed to the visitor or they are held for pick-up at the ticket kiosk near the Monument. Of the daily tickets available each day, 35 percent are now available via this mechanism with the remainder held for daily distribution. If advance reservations prove to be successful, the NPS would like to increase the percentage of tickets available via this method in the future.

The other ticketing option for visitors is to arrive at the ticket kiosk at 15th Street and Madison Drive between 8:30 a.m. and approximately 10:30 a.m. on the day they would like to tour the Monument (between 8:00 a.m. and 10:00 a.m. during the summer months between Memorial Day and Labor

Day). These tickets are distributed free-of-charge on a first-come, first-served basis to individuals, families, and groups. The ticket limit is six per individual and 60 per licensed tour provider.

Tour Process: Tour times are provided on the hour and the half-hour beginning at 9:00 a.m. and ending at 4:30 p.m. (between 8:00 a.m. and 11:30 p.m. during the summer). Upon arriving at the Washington Monument, visitors holding a ticket stand in one of two waiting lines on the Monument's east side near the temporary security screening facility. One line is for those with tickets for the tour on the hour and the other is for the tour on the half hour.

At the tour's appointed time, NPS Rangers begin moving small numbers of the tour into a waiting area outside the security facility, cordoned off by ropes. Visitors are then ushered into the small screening facility that connects directly to the base of the Monument. Security personnel explain the screening procedure and require visitors to remove all money, watches, and other metal items from their person and pass them through the screening devices. At the direction of the security personnel, visitors walk through the highly sensitive screening system one individual at a time. If the device emits a sound, then that visitor must be brushed with hand-held screening devices.

Upon clearing security, visitors enter the base of the Monument and wait on benches along the wall for the elevator. When the elevator arrives, visitors enter the elevator until it is at capacity. An NPS ranger operates the elevator and offers brief information about the Monument in the 70 seconds that it takes the elevator to ascend to the Observation Level at the Monument's top. When visitors alight from the elevator, they are free to spend an indefinite amount of time viewing Washington from the Monument windows and to study the exhibits on the floor below. To return to the Monument base, visitors walk down one flight of stairs to a lower floor to board the elevator. Exhibits regarding the history of the Monument and George Washington and a variety of books are available for viewing or purchase while waiting for the return elevator.

The return elevator journey is slightly longer than the ascent, taking a few minutes. On the descent, the elevator slows occasionally and the opaque panels in the elevator door become clear, enabling visitors to view some of the restored commemorative stones on the Monument's interior walls. The NPS ranger talks about the stones and answers visitor questions. At the base, visitors exit the Monument through a door on the side of the visitor screening facility, away from those visitors being screened prior to their tour.

Book Shop at top of Monument.

One of the 195 commemorative stones in the Monument stairwell.

4.3.3 Resource Interpretation

The features at the Washington Monument most enjoyed by visitors according to NPS staff include the views from the top of the Monument, the new ability to view the memorial stones from the Monument elevator, and the educational exhibits.

As noted during the description of the Monument tour, a variety of information is provided to visitors, primarily through interpretive exhibits in the Observation level at the top of the Monument and the floor directly below. At each of the windows in the Observation level, exhibits identify features in the current landscape and what was the historic landscape. Views to the north, south, east and west can be seen from the windows. Other exhibits focus on the history of the Monument and the history of George Washington. Information about the Monument and the memorial stones on the Monument's interior is also provided by an NPS ranger who operates the elevator as visitors both ascend to and descend from the top of the Monument.

A unique feature of the Washington Monument is the 195 commemorative stones that were placed on the interior Monument walls. Starting in 1848, the Washington National Monument Society invited states, cities, and patriotic societies to contribute memorial stones representing their respective location or group. The stones were to pay tribute to the character and achievements of George Washington and were to be durable; a product of the state's soil; and 4 feet long, 2 feet high, and 18 inches thick. Stones were provided by states throughout the country and by countries throughout the world in tribute to George Washington.

In the 1998 visitor survey, visitors were asked what subjects they would be most interested in learning about on a future visit. Most visitors (75%) are interested in learning about the history of the monuments and memorials, such as the Washington Monument. Visitors also want to learn about the people commemorated by the monuments and memorials such as George Washington. Over half of the visitor groups would prefer to learn the above information on a ranger-led walking tour. Brochures and ranger talks were the next most preferred method of learning.

Other Tours and Interpretation

Visitors to the Washington Monument often visit nearby memorials prior to or following their tour at the Monument. Visitors may view on their own or participate in tours at the Lincoln Memorial, Jefferson Memorial, Vietnam Veterans Memorial, Franklin Delano Roosevelt Memorial, and Korean War Veterans Memorial. The World War II Memorial is being constructed to the west of the Monument.

Tourmobile Sightseeing offers daily narrated shuttle tours to these and other sites on the National Mall and in Arlington National Cemetery. The Washington Mall tour includes the Washington Monument, Lincoln Memorial, Jefferson Memorial, West Potomac Park, Arlington National Cemetery, Bureau of Engraving and Printing, Holocaust Museum, U.S. Capitol, Union Station, Smithsonian museums, and White House and President's Park. One ticket allows unlimited free reboarding throughout the day at sites such as the Washington Monument. Boarding locations are located throughout the National Mall at the major monuments and memorials.

View of World War II Memorial construction site from top of Monument.

4.4 SOCIO-ECONOMIC ENVIRONMENT

4.4.1 Land Use

Land uses in the study area were inventoried to characterize the setting of the proposed security improvements to the Washington Monument. Inventories were conducted by field inspection and then cross-referenced by review of current planning documents and regulations. The documents include the *District of Columbia Generalized Land Use Map*, the *Comprehensive Plan for the National Capital, Federal Elements*, and various NPS information sources. Descriptions of land uses on and surrounding the Washington Monument are detailed below.

Site

The 73-acre Washington Monument Grounds are defined as the area of direct impact for this study. The Grounds are open Federal parkland, bounded by Constitution Avenue on the north, 14th Street on the east, Independence Avenue on the south, and 17th Street on the west. The site is presently used as a large park serving ceremonial, recreational, educational, and cultural functions. The park has both formal areas, such as the plaza around the Monument itself, and larger informal, pastoral areas, such as the rolling landscape farther away from the Monument's base.

Components of the site area include the following:

- The Monument Lodge, which is located east of the Monument on 15th Street, has a gift shop, public restrooms, and food concession stand.
- The Survey Lodge, which is located southwest of the Monument, is used as NPS offices. It also provides visitor information.
- The Sylvan Theatre, which is located southeast of the Monument, is used for free concerts, performances, and special events.
- The German-American Friendship Garden, which is located on Constitution Avenue and 16th Street, flanks the entrance to the existing parking lot. The garden was established to symbolize friendship between the German and the American people and to commemorate 300 years of German immigration and contribution to America.
- The open lawn areas around the Monument are primarily used for passive and active recreation, including walking, jogging, softball, kite flying, picnicking, and ball playing.

- Paved pathways between 4 and 12 feet in width radiate from the Monument to the northwest, southwest, northeast, southeast, and east. Residents and visitors use these pathways to traverse the Monument Grounds and the larger Monumental Core area. People also use these pathways for walking, jogging, and other recreational pursuits.
- The area around the base of the Monument is paved with asphalt and is used for the queuing of visitors who wish to ascend to the top of the Monument.
- An asphalt parking lot is located northwest of the Monument and entered from Constitution Avenue at 16th Street. The oval-shaped lot is 1.5 acres and can accommodate 108 cars but is not specifically designated for Washington Monument parking only.

Study Area

The Monumental Core can be considered a broader area of influence for the proposed security improvements to the Washington Monument and its Grounds. The Monumental Core is a broad greensward from the Capitol to the Lincoln Memorial and the White House to the Jefferson Memorial. The District of Columbia Generalized Land Use map categorizes the entire Monumental Core area as “parks, recreation and open space.” Land uses are institutional, such as museums, galleries, memorials, and other cultural uses. Popular tourist destinations in the Monumental Core include the White House, Lincoln Memorial, Jefferson Memorial, Franklin Delano Roosevelt Memorial, Vietnam Veterans Memorial, Korean War Veterans Memorial, National Museum of American History, National Museum of Natural History, National Gallery of Art (West and East Wing), National Air and Space Museum, Hirshhorn Museum of Art, Arts and Industries Building, Smithsonian Institution Building, Museum of African Art, Arthur M. Sackler Gallery of Asian Art, Freer Gallery of Art, Constitution Gardens, and U.S. Botanical Gardens.

Planning Controls and Policies

While private properties within the District of Columbia are subject to the zoning regulations of the District of Columbia, the regulations have no jurisdiction over U.S. Government properties. Therefore, the Site and Study area, which is NPS land, is not zoned. However, the District of Columbia Zoning Enabling Act (1958) gives the NCPC “in lieu of zoning” approval for height, bulk, number of stories, and open space for Federal buildings and projects. NCPC makes a decision on these aspects on a case-by-case basis.

The 1976 approved Master Plan for the National Mall provides the overall guidance and context for the Washington Monument Grounds. Pursuant to the Master Plan, there are approved development concepts for the Grounds, such as the 1993 DCP, which was based on the earlier 1989 and 1981 DCPs.

The Comprehensive Plan for the National Capital, Federal Elements (1977-1984, updated 1990) is the principal planning document adopted by NCPC for the planning of Federal facilities. The Plan represents a compendium of policies, known as elements, and recommendations about long-term development of Federal lands and the Federal interest in Washington, DC. The chapters entitled "Parks, Open Space, and Natural Features" and "Preservation and Historic Features" are particularly relevant to land use, as discussed in this EA.

The Parks, Open Space, and Natural Features element designated the Washington Monument Grounds as a Monumental Park. The following policy from this element is applicable:

- Monumental and Decorative Parks should serve as settings to enhance public buildings, monuments, and memorials; as such, their fundamental integrity should be protected. Additionally, they should serve as outdoor areas for displays and cultural activities, as well as areas for passive and controlled active recreational activities, including lunchtime picnics and gatherings.

Since the Washington Monument is designated in the document as a historic property and landscape, several policies in the Preservation and Historic Features element apply:

- New construction on Historic Landmarks or in Historic districts should be compatible with the historic architectural character and cultural heritage of the landmark or district. In design, height, proportion, mass, configuration, building materials, texture, color and location, new construction should complement the valuable features of the landmark or district, particularly features in the immediate vicinity to which the new construction will be visually related.
- The distinguishing qualities of character of Historic Landscapes should be protected and enhanced.

Since various elements of the Washington Monument Grounds, such as the Monument Lodge and the Survey Lodge are historic structures that contribute to the historic landscape, the following policy applies:

- Every effort should be made to provide for the continued, appropriate use of all Historic Properties. If the original use or an appropriate intensification of the original use is no longer feasible, appropriate adaptive uses consistent with applicable use regulations should be encouraged.

Since 15th Street, a designated Special Street, is part of the Washington Monument Grounds, the following policy applies:

- The integrity of the form and design of Special Streets and Places, particularly those of historic significance should be maintained and protected to the extent feasible and as warranted by safety requirements from unnecessary traffic channelization and from encroachment of new buildings into public space.

The Supreme Court recognizes the importance of parks in the Nation's Capital as venues for special events and First Amendment demonstrations but has stated that special events and demonstrations are subject to reasonable time, manner, and place restrictions. NPS is charged with the responsibility for managing and maintaining the National Parks and is authorized to regulate use of the parks. To this end, NPS has procedures for allowing informal use of open space and permitting of special events or demonstrations. The following rules and regulations apply to the subject site:

- Commercial sales are prohibited except for authorized concessions.
- No demonstrations are allowed within the paved concrete circle at the base of the Monument (36 CFR 7.96 (G)).
- Persons are required to obtain a special permit from NPS to use the Washington Monument Grounds to conduct activities including sporting events, demonstrations, and special events.

Furthermore, the Concessions Policy Act of 1965 (P.L: 89-249, 79 Stat. 969, 16 U.S.C 20 et seq.) requires that "public accommodations/facilities/services in national park system areas be provided only under carefully controlled safeguards to protect against despoliation." The act also limits development to those areas that are "necessary and appropriate for public use and enjoyment and that are consistent to the highest practicable degree with the preservation and conservation of the areas."

4.4.2 Recreation

The Tidal Basin is a scenic walking area in the vicinity of the Washington Monument.

Open space and its associated natural, scenic, and recreational qualities is a high priority in the District of Columbia. The NPS has jurisdiction over more than 6,400 acres of open space in the District. These parks, trails, rivers, shorelines, and other areas form the heart of the Capital city's open space system, as well as satisfy the recreation needs of its visitors and residents.

NPS *Management Policies* state that enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks. Because many forms of recreation do not require a national park setting, NPS will therefore:

- Provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks
- Defer to local, state, and other Federal agencies; private industry; and nongovernmental organizations to meet the broader spectrum of recreational needs and demands

Washington Monument Grounds

Development of recreation in the District of Columbia was a key part of the national park movement at the beginning of the 20th century. Instead of "rural parks" popular in the 19th century, modern social notions suggested development of a varied, active urban park scheme for Washington. To this end, the McMillan Plan of 1901 reserved the land south and west of the Monument for public enjoyment; formal gardens around the Monument's base would provide respite and a "Washington Common" area to the south would accommodate a stadium, ballpark, open air gymnasium, and playgrounds. Although the McMillan Commission's designs were never fully undertaken, portions of the Monument Grounds hosted baseball diamonds, football fields, tennis courts, and temporary children's playgrounds in the early part of the century. Furthermore, the reclamation of land from the Potomac River added thousands of acres to the park system.

Today, the Washington Monument Grounds constitute the largest open space in the heart of the Nation's Capital. The area is used for a variety of recreational activities, including walking, picnicking, sunbathing, kite-flying, skating, ball playing, and biking. The recreation uses are most

frequent in the spring, summer, and fall. However, the District of Columbia's temperate climate allows some of the recreational uses, such as jogging, to occur year-round.

Nature lovers and picnickers enjoy the open expanses of the Grounds. Hikers and joggers use the various Washington Monument walks as part of their route. Pathways to the base of the Monument do not meet standards for handicapped accessibility. Likewise, the existing concrete jersey barriers around the Monument disrupt access to pathways across the Monument Grounds.

In addition to informal ball games, there are a number of local recreation leagues that play sports, such as softball, kickball, and flag football, primarily on the northeastern and western portions of the Grounds, where the topography is flatter and more suitable for these activities. These leagues are required to obtain a permit from NPS to use the Washington Monument Grounds for any organized recreational use.

The National Mall and Monumental Core

L'Enfant planned the National Mall as a "place of general resort" that would have "public walks," which were defined as tree-lined promenades flanked by public buildings. Today, the 140 acres of the Mall and Washington Monument Grounds function as L'Enfant intended; the large open space areas accommodate the needs of the local population and visitors. Popular recreational activities include soccer, frisbee playing, volleyball, walking, inline skating and bicycling. Bicycles and inline skates are allowed along paved roads and walkways in the park, but are not allowed in the memorial or monument areas. All sidewalks near the Mall and Ellipse are open to bicycle use. Other nearby recreational resources include pedal boats on the Tidal Basin, recreational fields in West Potomac Park, and various nearby trails, as indicated in Table 4.2.2-2.

Table 4.2.2-1
NPS Trails near the Monument Grounds

Trail Name	Length
The Washington Monument Grounds Walks	0.9 miles
The Tidal Basin Shoreline Trail	2 miles
The Mall	1.8 miles
Reflecting Pool Walkways	1 mile
Independence Avenue	0.8 miles
Constitution Avenue	0.9 miles
Potomac Park Shoreline	2.6 miles

Source: NPS – National Capital Region

The *Comprehensive Plan for the National Capital, Federal Elements (1977-1984, updated 1990)* preserves the open space and recreational use of the Mall. The chapter specifies that the Mall should "primarily serve as a formal setting for the Capitol, the White House, the Washington Monument, the Lincoln Memorial, the Jefferson Memorial and the Tidal Basin and should be maintained as a large, landscaped open area. It should also serve the passive/leisure and active recreational needs of Visitors, as well as residents, to the extent that its primary purpose is not compromised."

4.4.3 Socio-Economic Resources

Socio-economic resources include population and demographic characteristics, housing, community facilities, and economic and fiscal conditions. There are no residential units or private commercial office buildings on the Monument Grounds or within the immediate study area.

4.4.4 Infrastructure

Existing infrastructure at the Washington Monument Grounds includes utilities comprising electric, gas, steam, water, and storm and sanitary sewer lines as well as circulation systems such as walking paths and the 16th Street parking lot. The utilities on the Grounds adequately meet needs at the current level of visitation to the Monument. However, the pathways on the Grounds do not sufficiently meet accessibility requirements. Additional information about the existing stormwater and sanitary sewer lines and circulation infrastructure at the Grounds is presented in further detail within the discussions regarding existing conditions of water resources and transportation.

View of the Monument from a distance.

4.4.5 Transportation

The Washington Monument Grounds are accessible from a regional transportation network that consists of a many modes of transport. An increasing number of visitors are utilizing the Metrorail subway system to access attractions in Washington, particularly in the Monumental Core. The Smithsonian stop adjacent to 11th Street on the Mall is approximately 1,000 feet from the Monument Grounds. Therefore, this section addresses the components of the transportation system that are applicable to the affects of the alternatives, which include pedestrian walkways on the Grounds and the National Mall, and parking.

<u>Pedestrian Access</u>

Walkways on the Grounds provide pedestrian access to the Grounds and the Monument from areas throughout the National Mall.

The Monument Grounds are located at the confluence of several pedestrian routes of the National Mall. These routes provide access to the Ellipse and White House to the north; the Mall and

Smithsonian to the east; the Holocaust Memorial Museum and Bureau of Engraving and Printing to the south; and the Rainbow and Reflecting Pools, the Lincoln Memorial, and Korean War Veterans, Vietnam Veterans and World War II Memorials to the west.

The parking lot on the north side of the Grounds at 16th Street.

Parking

Parking is provided on the Grounds at a parking lot on the north side of the Grounds, which is accessed from Constitution Avenue. The parking lot has108 parking spaces metered for 2 hours. These spaces are not specifically designated for Washington Monument and Grounds visitors only. Removal of this parking lot was approved by CFA, NCPC, DC SHPO, and ACHP as part of the 1993 DCP.

There are approximately 2,000 parking spaces within walking distance (1,500 feet) of the Washington Monument and its Grounds. Parking is available along Constitution Avenue, along Madison and Jefferson Drives, at the Tidal Basin boat concession, at the Jefferson Memorial, along Ohio Drive and at three parking lots in West Potomac Park. As with the parking lot on the Washington Monument Grounds, parking in the area is not specific to any one memorial and is dispersed to allow parking with pedestrian access to all the area memorials.