



DRAFT ENVIRONMENTAL IMPACT STATEMENT SOUTH MALL CAMPUS MASTER PLAN

NOVEMBER 2017

Responsible Agency:



Project Owner:



Smithsonian Institution

In cooperation with:



With technical assistance from:



DRAFT ENVIRONMENTAL IMPACT STATEMENT

Responsible Agency:
National Capital Planning Commission
401 9th Street, NW, Suite 500
Washington, DC 20004

Project Owner:
Smithsonian Institution

In cooperation with:
National Park Service

South Mall Campus Master Plan

The National Capital Planning Commission (NCPC), acting as lead federal agency, along with the Smithsonian Institution (SI) as the project owner, and in cooperation with the National Park Service (NPS), has prepared this Draft Environmental Impact Statement (EIS) to evaluate the potential environmental impacts associated with implementing the South Mall Campus Master Plan. The No-Action Alternative and three action alternatives are studied in detail in this Draft Environmental Impact Statement.

Questions or comments on the Draft Environmental Impact Statement should be addressed to by January 16, 2018:

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EXECUTIVE SUMMARY

The Draft Environmental Impact Statement has been prepared pursuant to:

- National Environmental Policy Act (NEPA) of 1969;
- Council on Environmental Quality's Regulations of Implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508);
- NCPC's implementing regulations (1 CFR § 601);
- National Capital Planning Act (40 United States Code [USC] § 8722 (b)(1)(d)).

ES.1 PROPOSED ACTION

The Smithsonian Institution (SI) is preparing a Master Plan for its South Mall Campus to guide future short-term and long-term renovation and development of the 17-acre campus by establishing holistic planning and design principles. The Campus includes the Smithsonian Institution Building, the Arts and Industries Building, the Freer Gallery of Art, the Quadrangle Building, and the Hirshhorn Museum and Sculpture Garden, and associated Gardens and landscaped settings. The proposed Master Plan would be implemented over a 10- to 20-year period beginning in 2018.

The proposed Master Plan has four primary goals:

- To preserve and protect the historic buildings and features of the Campus;
- To improve and expand visitor services and education;
- To create clear accessible entrances and connections between the museums and gardens of the South Mall Campus, the National Mall, and the neighborhood; and
- To replace aging building systems that have reached the end of their lifespan.

The Master Plan is needed to meet SI's long-term space requirements and to address physical and operational deficiencies across the campus that impact visitor use and experience as well as SI's ability to implement its programs effectively and safely. SI identified the following needs for the campus:

- Restore, repair, and rehabilitate historic properties;
- Replace roofs and building systems that are at the end of their useful lives;
- Improve accessibility and usability by individuals with disabilities;
- Improve circulation throughout the campus, including creation of a clear east-west at-grade pedestrian connection from the east side of the Freer Gallery to the Hirshhorn Museum entry plaza;
- Improve access and visibility from the National Mall and the Castle for the NMAfA and Sackler Gallery entrances;
- Create expanded and linked centralized visitor services and education spaces;
- Provide additional museum and event space;
- Establish a new central utility plant and related infrastructure to reduce energy and operating costs and greenhouse gas emissions;
- Provide expanded below grade loading and delivery facilities serving the Quadrangle Building, Castle, AIB and Freer buildings; and
- Update security measures to meet SI and federal requirements.

NCPC and SI will make a decision on which alternative would be implemented in the Master Plan for the South Mall Campus. NCPC and SI will consider comments received on the EIS when making their decision. This decision will be documented in a Record of Decision (ROD). The ROD will outline the selected alternative for the South Mall Campus Master Plan and describe measures the SI will take to reduce impacts associated with implementation of the Master Plan.

Environmental issues were identified through the initial scoping efforts and through the Section 106 Consultation process. These issues are addressed throughout the Draft Environmental Impact Statement.

ES.2 ALTERNATIVES

ES.2.1 NO-ACTION ALTERNATIVE

Under the No Action Alternative, the Smithsonian would continue to use the existing interior building spaces and exterior spaces as they do currently with minor adjustments over time to accommodate organizational changes in office areas, minor exhibit-related changes, seasonal garden changes and similar. Desired programmatic changes such as a central loading and mechanical plant would not be implemented. Programmed spaces for restrooms, kitchen, offices and other uses that are currently impinging on the Castle Great Hall and Upper Great Hall would not be relocated. Additional visitor amenities, galleries and educational spaces would not be added to any of the buildings. Specifically, under the No-Action Alternative, SI would continue its current management of the South Mall Campus including the following:

CASTLE

- Continue basic maintenance of interior and exterior façade.
- Upkeep of existing outdated and inefficient mechanical systems
- Retain undersized and inadequate visitor services.

QUADRANGLE BUILDING AND HAUPT GARDEN

- Patch and repair of roof membrane, as required.
- Replant the Haupt Garden following Quadrangle Building roofing membrane repairs.
- Retain pavilions for each component in the Quadrangle Building with no shared or integrated services.

UTILITIES, LOADING, AND OTHER MUSEUMS

- Retain GSA steam and chilled water, which does not meet museum curatorial exhibit criteria, and continue repairs to individual outdated mechanical systems.
- Patch and repair building envelopes, as required.
- Retain undersized existing loading docks which are not currently accessible to larger vehicles and requires curbside loading. The limited size of the existing loading facility also provides inadequate separation of collections, food services, recycling, and refuse.

ES.2.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

SMITHSONIAN INSTITUTION BUILDING (CASTLE)

With all Action Alternatives, a permanent relocation of many of the offices now housed on upper levels of the Castle to an offsite Central Administrative Headquarters, essential to the restoration of the Upper Great Hall and its return to use by the public would occur. These large spaces would provide additional education and assembly space. Similarly, uses currently impinging on the full length of the Great Hall would be relocated to below grade spaces in the renovated Castle Basement and new Visitor Center between the Castle and Quadrangle. The east wing of the Castle would remain as office space for central Smithsonian leadership. The Schermer Lounge and Castle Commons would continue to be public space, made more useful by the lowering of the Commons floor to eliminate the need for a ramp in the Lounge. All Master Plan Alternatives would also enhance the security of the Castle through blast mitigation of the building's exterior envelope. Excavation beneath the Castle and the addition of base isolators beneath the foundation would occur to protect from seismic occurrences. The Castle would also be structurally braced to protect it from seismic occurrence, if deemed necessary. The basement floor would be lowered to provide code-compliant floor to ceiling height and the

existing mechanical elements would be removed to expose the historic masonry vaults, piers, and walks. The new lowered basement floor would allow for a connection from the basement to the new, below-grade Visitor Center south of the Castle.

FREER GALLERY OF ART

The Freer Gallery of Art remains largely unchanged with the exception of altering the east wall and historic window configuration to create an Americans with Disabilities Act (ADA) accessible entrance, the new loading ramp descending from Independence Avenue on its west side, and below grade service connections to the new loading and central utilities. Specifically:

QUADRANGLE BUILDING AND HAUPT GARDEN

Elements common to all Action Alternatives include replace the roof membrane of the Quadrangle Building and demolishing the Ripley Center entry pavilion (Ripley Center education facilities to be accessed through the new Visitor Center).

HIRSHHORN MUSEUM AND SCULPTURE GARDEN

For all Action Alternatives, the Hirshhorn Museum and Sculpture Garden retains its current public exhibits space and office areas housed in above grade levels, with the benefit of an improved building envelope and renovated mechanical systems. The Hirshhorn building would be rehabilitated. A new connecting path from its plaza to the AIB would be implemented and the Hirshhorn Plaza and the Sculpture Garden perimeter walls would be restored.

ARTS AND INDUSTRIES BUILDING

For all Action Alternatives, the AIB would continue its current use and planned improvements as a location for a variety of interim uses, special events and

exhibits until renovation for a permanent use is designated by Congress, including a potential Latino Museum for which a bill has been introduced in both the Senate and the House of Representatives. Accommodation for a permanent use of AIB has been taken into account in the sizing and location of the central loading and mechanical facilities. The non-historic east door of the AIB would be removed and the interior of the AIB would be opened to provide a continuous connection from the Haupt Garden to the Hirshhorn Plaza. The surface parking lot east of AIB would be removed to expand the Ripley Garden. Structural underpinning to the west side of the AIB foundation would be added to accommodate below-grade excavation for the central utility plant. Lastly, progressive collapse measures to address seismic vulnerability would be implemented when the building is renovated.

UTILITIES, LOADING, AND OTHER MUSEUMS

Elements common to all Master Plan Alternatives include the addition of a central mechanical plant to be located below grade between the existing Quadrangle building and the Arts and Industries Building. A central underground loading dock would be below the west end of the Castle and the Freer Gallery's north plaza would be constructed and would be accessed from a ramp to the west of the Freer Gallery. This larger loading facility would allow the current Sackler loading ramp to be removed from the Haupt Garden and would eliminate the need for the surface loading and parking lot to the east of the AIB building. Centralizing loading allows for the Smithsonian to accommodate the larger trucks used to deliver traveling exhibits and avoids the need for trucks to maneuver in the street or back down the existing one-way ramp at the Sackler. The new loading would also provide additional recycling space and storage for Smithsonian Gardens grounds keeping equipment and supplies. It would allow a more distinct separation of collections loading from other loading, improving the security and environmental protection of the

Smithsonian's national collections and collections loaned by others. Perimeter security elements would be installed around the entire South Mall Campus.

ES.2.3 ALTERNATIVE B: LIMITED ABOVE GROUND CHANGE

In this alternative, above grade changes would be minimized while still accommodating improvements to the South Mall Campus' infrastructure. For the Quadrangle Building, the current museum pavilions would remain. Consideration would be given to relocating the entrances to the existing full height pavilion windows facing north to provide greater visibility from the Castle and north side of the Haupt Garden. Alterations to the Haupt Garden would be limited to replacement of the Quadrangle Building's roof membrane and improvements to circulation. To protect the Castle from seismic events, base isolation would be used in conjunction with limited reinforcement. Related to the construction of a central loading facility, the Ripley pavilion would be demolished. At the east of the Hirshhorn Museum, the Sculpture Garden wall and existing tunnel would be restored. To better segregate exhibit, event, and trash delivery / transfer an enlarged below grade central loading dock would be built.

Below grade changes would be limited to those needed to create a minimal public connection to the Visitor Center and to connect the new loading and mechanical facilities to the existing circulation and air distribution systems of the Quadrangle. Remaining portions of the former Sackler loading dock would be repurposed for back-of-house support. Smithsonian Associates offices and NMAfA and the Sackler Gallery museum uses would be expanded into space made available by the relocation of some or all of the classroom and Discovery Theater education spaces to the new Castle Visitor Center. The connection to the Visitor Center would require further study to determine if this would still be worthwhile because of the distances involved and the conflicts created by crossing paths with museum collections circulation which occurs when the

museum public entrances and circulation are not moved closer to the Castle as in Alternatives D and F. Therefore, as shown in Figures 3-3, 3-4, and 3-5, in addition to the elements that are common to all Master Plan Alternatives, under Alternative B, SI would:

CASTLE

- Excavate a limited sub-basement area beneath the west end of the building footprint to provide loading and utility support.
- Construct new below-grade Visitor Center in previously unoccupied area between Castle basement and Quadrangle Building.
- Introduce new access stairs to below-grade Visitor Center.

QUADRANGLE BUILDING AND HAUPT GARDEN

- Make minor renovations to sublevels to connect the new loading dock to existing Collections circulation system and to connect the new central utility plant to the existing distribution system.
- Reinstall the Haupt Garden, and retain existing features, after replacement of the Quadrangle Building roof membrane.
- Maintain Quadrangle Building Museum Pavilions (Sackler and NMAfA) and relocate entries to north-facing elevations of existing pavilions.

HIRSHHORN MUSEUM AND SCULPTURE GARDEN

- Remove a small portion of west-facing Hirshhorn Plaza wall to create east-west circulation.
- Restore/reopen the original tunnel connection between the Hirshhorn Plaza and Sculpture Garden.

UTILITIES AND LOADING

- Construct a new below-grade utility plant in an unexcavated area west of AIB.

ES.2.4 ALTERNATIVE D: PLAN CHANGES ABOVE AND BELOW GRADE

Under Alternative D there would be increased visibility and access entries from the National Mall, new museum pavilions, direct access from garden to amenities, cohesive Campus circulation, and connections between the Castle and Quadrangle Building. A new below grade visitor center extending from the Castle basement to the Quadrangle Building would be accessed via a sloped Haupt Garden that provides for an at grade garden entrance and windows to the garden. Visitor amenities including dining and museum shop would be located at the new Visitor Center so as to enable a less encumbered restoration of the historic above grade public spaces of the Castle and to double the number of visitors accommodated from 1 million to 2 million annually. The amount of space for Smithsonian Associates and other educational programs would similarly significantly increase and would be housed in the Visitor Center as well as at the north end of the reconfigured Quadrangle building. Importantly, the visitor center and education spaces would be adjacent and connected and would provide the Smithsonian with a location that includes a central large assembly space with adjacent smaller rooms for breakout sessions, a requirement for many conferences. This would significantly improve the Smithsonian's ability to host scientific meetings and similar gatherings as there are no comparable venues currently.

Alternative D reconfigures the Quadrangle Building to better meet the program needs of the Sackler Gallery and NMAfA and the Smithsonian education programs currently housed there. A key priority for the museums is the location of their entrances closer to the Castle Visitor Center and the National Mall, providing better visitor access as well as benefitting from the ability to share direct access to amenities including the new assembly and education spaces in the Visitor Center. The museums currently are adjacent but separated with little ability to share space and activities and circulate between them. Alternative D would provide greater connectivity between the museums, supporting the

increasingly pan-Institutional emphasis in Smithsonian programming and research. This alternative would provide the ability for each museum to expand both galleries and back of house spaces while maintaining required separations between public space and collections processing and storage space. The roof of the building would include a substantially reconfigured and expanded Haupt Garden with direct access to the Visitor Center amenities and education spaces and improved ability to host educational programs and events in the garden.

At the Hirshhorn Museum, Alternative D would provide substantial expansion of gallery space suited to large contemporary artworks through a redesign of the Sculpture Garden that would raise the level of portions of the garden with the new galleries located below. These new galleries would be connected back to the museum through an expanded tunnel beneath Jefferson Drive to reconfigured basement level public space. The Hirshhorn Museum has recently enjoyed a substantial increase in visitation and this expansion below grade would allow it to better serve its visitors and support its ambitious program of changing exhibitions and educational programs.

In addition to circulation enhancements, Campus infrastructure would be developed. At the Castle, seismic base isolation would be installed in conjunction with a central utility plant. To better segregate exhibit, event, and trash delivery / transfer an enlarged below grade central loading dock would be built. Related to the construction of a central loading facility, the Ripley pavilion would be demolished. Therefore, as shown in Figures 3-6, 3-7, and 3-8, in addition to the elements common to all Master Plan Alternatives, under Alternative D, SI would:

CASTLE

- Excavate a sub-basement area that extends beyond the footprint of the Castle to provide loading and utility support.
- Reconfigure Castle basement for use as a Visitor Center and improve connection to Quadrangle Building.

QUADRANGLE BUILDING AND HAUPT GARDEN

- Introduce new, exterior, below-grade dip entrance with universal ADA accessibility to the Visitor Center.
- Replace a portion of Quadrangle Building's roof to allow for a sloped landscape-grade entry to the Visitor Center.
- Expand Haupt Garden and reconfigure garden pathways on to the former footprints of the museum pavilions and loading dock.
- Remove Sackler Gallery and NMAfA museum pavilions and Install new museum entry pavilions closer to the National Mall.
- Remove existing Quadrangle Building roof bulkheads.
- Expand extent of existing skylights and install new skylights immediately south of the Castle.
- Reestablish historic view of the Washington Monument from south of the Castle.
- Improve historic view of Castle from Independence Avenue, SW.

HIRSHHORN MUSEUM AND SCULPTURE GARDEN

- Remove the Hirshhorn Plaza walls to the north, east and west to open the Museum to the National Mall.
- Expand the tunnel from the Hirshhorn Museum to the Sculpture Garden.
- Remove and reconfigure interior Sculpture Garden walls.
- Reconfigure Sculpture Garden to add new below-grade galleries. The Sculpture Garden would maintain a recessed relationship to the National Mall.

UTILITIES AND LOADING

- Construct a new central utility plant at sub-basement level beneath the Castle.

ES.2.5 ALTERNATIVE F – MAINTAIN FLAT PLAN ON CASTLE AXIS

Alternative F provides Increased visibility and access entries from the National Mall, new museum pavilions, direct access from garden to amenities, cohesive Campus circulation, and connections between the Castle and Quadrangle.

With Alternative F new below grade visitor center extending from the Castle basement to the Quadrangle Building would be accessed via the existing north and south entrances and stairs or elevators from the Great Hall as well as new public stairways from the Haupt Garden. Alternative F maintains the character of the Haupt Garden while remaining at grade. Gardens focus on creating both intimate and education spaces. New pavilions provide accessible entry to visitor center. Visitor amenities including dining and museum shop would be located at the new Visitor Center so as to enable a less encumbered restoration of the historic above grade public spaces of the Castle and to double the number of visitors accommodated from 1 million to 2 million annually. The amount of space for Smithsonian Associates and other educational programs would similarly significantly increase and would be housed in the Visitor Center as well as in a new assembly space at the north end of the reconfigured Quadrangle Building. Importantly, the visitor center and education spaces would be adjacent and connected and would provide the Smithsonian with a location that includes a central large assembly space with adjacent smaller rooms for breakout sessions, a requirement for many conferences. This would significantly improve the Smithsonian's ability to host scientific meetings and similar gatherings as there are no comparable venues currently.

Alternative F reconfigures the Quadrangle Building to better meet the program needs of the Sackler Gallery and the NMAfA and the Smithsonian education programs currently housed there. A key priority for the museums is the location of their above grade entrances closer to the Castle Visitor Center and the National Mall, providing better visitor access as well as benefitting from the ability to share direct access to amenities including the new assembly and education spaces in the Visitor Center. The two new entrance pavilions would be smaller than the current three pavilions, increasing the area available for the Haupt Garden. The museums currently are adjacent but separated with little ability to share space and activities and circulate between them. Alternative F would provide greater connectivity between the museums, supporting the increasingly pan-Institutional emphasis in Smithsonian programming and research. This alternative would provide the ability for each museum to expand both galleries and back of house spaces while maintaining required separations between public space and collections processing and storage space. The roof of the building would include a reconfigured and expanded Haupt Garden with improved access to the Visitor Center amenities and education spaces and improved ability to host educational programs and events in the garden. Alternative F would retain many of the characteristics and specific features of the present Haupt Garden including a parterre on axis with the Castle, intimate gardens, gardens themed to adjacent museums and the Renwick Gates at Independence Avenue.

At the Hirshhorn Museum and Sculpture Garden, Alternative F would provide substantial expansion of gallery space suited to large contemporary artworks through a redesign of the Sculpture Garden that would raise the level of portions of the garden with the new galleries located below. These new galleries would be connected back to the museum through an expanded tunnel beneath Jefferson Drive to reconfigured basement level public space. The Hirshhorn Museum has recently enjoyed a substantial increase in visitation and

this expansion below grade would allow it to better serve its visitors and support its ambitious program of changing exhibitions and educational programs.

In addition to circulation enhancements, Campus infrastructure would be developed. At the Castle, seismic base isolation would be installed in conjunction with a central utility plant. To better segregate exhibit, event, and trash delivery / transfer an enlarged below grade central loading dock would be built. Related to the construction of a central loading facility, the Ripley Pavilion would be demolished. Therefore, in addition to the elements common to all Master Plan Alternatives, under Alternative F, as shown in Figures 3-9, 3-10, and 3-11, SI would:

CASTLE

- Excavate a limited sub-basement area beneath the west end of the building footprint to provide loading and utility support.
- Construct new below-grade Visitor Center in previously unoccupied area between Castle basement and Quadrangle Building and with a new entrance to the Visitor Center south of the Castle.

QUADRANGLE BUILDING AND HAUPT GARDEN

- Construct exterior entrance stairs to the Visitor Center at north edge of Quadrangle Building and Haupt Garden.
- Expand the Haupt Garden, while remaining at grade.
- Reconfigure garden pathways on to the former footprints of the museum pavilions and loading dock.
- Maintain intimate garden spaces, parterre, and Renwick Gates in the Haupt Garden.
- Remove Sackler Gallery and NMAfA museum pavilions and construct new entry pavilions closer to the National Mall.

- Expand extent of skylights around the Quadrangle Building and Castle.
- Reestablish historic view of the Washington Monument from south of the Castle.
- Improve historic view of Castle from Independence Avenue, SW.

HIRSHHORN MUSEUM AND SCULPTURE GARDEN

- Remove a small portion of west-facing Hirshhorn Plaza wall to create east-west circulation.
- Expand the tunnel from the Hirshhorn Plaza to the Sculpture Garden.
- Reconfigure the Sculpture Garden to add new below-grade galleries. The Sculpture Garden would maintain a recessed relationship to the National Mall.

UTILITIES AND LOADING

- Construct a new below-grade utility plant in an unexcavated area west of AIB.

ES.3 ENVIRONMENTAL IMPACTS SUMMARY

More detailed analysis for each alternative can be found in Chapter 4: Affected Environment and Environmental Consequences.

ES.3.1 IMPACTS ON TOPOGRAPHY

NO-ACTION ALTERNATIVE

- Minimal ground disturbance during routine repairs would result in direct and indirect short-term, negligible, adverse impacts.

ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

- Exposure and disturbance of soils during construction would result in direct and indirect short-term, minor adverse impacts.

- Excavation would result in direct, short and long-term, minor, adverse impacts to previously disturbed soils and Campus' topography.

ALTERNATIVE B

- Exposure and disturbance of soils during construction would result in direct and indirect short-term, minor, adverse impacts.
- Excavation would result in direct, short and long-term, moderate, adverse impacts to previously disturbed soils and Campus' topography.

ALTERNATIVE D

- Exposure and disturbance of soils during construction would result in direct and indirect short-term, minor, adverse impacts.
- Excavation would result in direct, short and long-term, major, adverse impacts to previously disturbed soils and Campus' topography.

ALTERNATIVE F

- Exposure and disturbance of soils during construction would result in direct and indirect short-term, minor, adverse impacts.
- Excavation would result in direct, short and long-term, moderate, adverse impacts to previously disturbed soils and Campus' topography.

ES.3.2 IMPACTS ON SEISMIC VULNERABILITY

NO-ACTION ALTERNATIVE

- Direct, long-term, major, adverse impacts from lack of seismic protection.

ALL MASTER PLAN ALTERNATIVES

- Direct, short-term, minor, adverse impacts during construction due to increased vulnerability.
- Seismic upgrades would result in a direct, long-term, major, beneficial impact.

ES.3.3 IMPACTS ON STORMWATER

NO-ACTION ALTERNATIVE

- There would continue to be a limited ability to retain and filter stormwater resulting in an indirect, long-term, minor adverse impact would occur.

ALL MASTER PLAN ALTERNATIVES

- Direct and indirect, short-term, minor, adverse impacts during construction.
- Direct and indirect, long-term, moderate, beneficial impacts from reduction of impervious surface and implementation of stormwater management.

ES.3.4 IMPACTS ON AIR QUALITY

NO-ACTION ALTERNATIVE

- Construction activities during routine repairs would result in direct, short-term, minor, adverse impacts.
- Direct, long-term, minor, adverse impacts would occur from continued use of GSA steam and chilled water and existing mechanical systems.
- Indirect, long-term, negligible, adverse impacts from emissions created by additional traffic.

ALL MASTER PLAN ALTERNATIVES

- Construction activities would result in direct, short-term, minor, adverse impacts.
- New mechanical systems and central utility plant would result in direct and indirect, long-term, minor, beneficial impacts.
- A minor increase in vehicular trips would result in an indirect, long-term, negligible, adverse impact.

ES.3.5 IMPACTS ON GREENHOUSE GASES, CLIMATE CHANGE & ENERGY CONSUMPTION

NO-ACTION ALTERNATIVE

- Direct and indirect, short and long-term negligible, minor, adverse impacts from continued use of GSA steam and chilled water and existing mechanical systems.

ALL MASTER PLAN ALTERNATIVES

- Construction activities would result in direct, short-term, minor, adverse impacts.
- New mechanical systems and central utility plant would result in direct and indirect, long-term, negligible, beneficial impacts

ES.3.6 IMPACTS ON CULTURAL RESOURCES

NO-ACTION ALTERNATIVES

- Direct, long-term, moderate, adverse impacts from minor repairs and potential seismic and blast vulnerability.

ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

- Construction activities would result in direct, short-term, moderate to major, adverse impacts.
- There would be long-term, minor, adverse impacts to the Freer Gallery from the alteration of the east wall.
- Blast protection, base isolation, and seismic bracing of the Castle would not result in adverse effects. Protecting the Castle from potential blast and/or seismic events would result in a long-term beneficial impact.
- Lowering the basement floor of the Castle and restoring the Castle would result in long-term, beneficial impacts.
- Removing the parking lot at AIB and restoring the east door to use would result in long-term, beneficial impacts.

- Renovating the Hirshhorn Building and Plaza and replacing the garden walls would result in long-term, beneficial impacts.
- Replacing the Quadrangle Building roof membrane would not adversely impact cultural resources.
- Perimeter security has the potential to have a long-term adverse adversely impact to the character of the National Mall.

ALTERNATIVE B

- Construction activities would result in direct, short-term, moderate to major, adverse impacts.
- The small opening that would be inserted on the west plaza wall of the Hirshhorn would create, long-term, minor adverse impacts.
- Reopening the tunnel would result in long-term, beneficial impacts.
- Minor, long-term, adverse impact would result from the reconfiguration of the Haupt Garden.
- Reorienting the Quadrangle Building Museum pavilions would not have an adverse impact on cultural resources.
- Impacts to cultural resources associated with the creation of a New Visitor Center, central utility plant, sub-basement excavation of the Castle, and excavation for a new loading ramp would be evaluated at the time of project design.
- There would be no indirect impacts.

ALTERNATIVE D

- Construction activities would result in direct, short-term, moderate to major, adverse impacts.
- Sub-basement excavation of the entire Castle would create a long-term, moderate, adverse impact.
- Below-grade “dip” entrance to the Visitor Center would result in direct, long-term, major adverse impacts to the Castle.

- Reconfiguration of the Haupt Garden and removal and replacement of the Quadrangle Museum Pavilions would result in direct, long-term, major, adverse impacts by improving visibility
- Direct, long-term, major adverse impacts from the removal of plaza walls at the Hirshhorn.
- Major, indirect, long-term impacts from the changes to the Hirshhorn Sculpture Garden and the reconfiguration of tunnel would result in moderate, long-term, adverse impacts.
- Removal of the pavilions would result in a long-term, major, adverse impact to the Quadrangle building.
- Removal and replacement of skylights would result in a long-term, moderate adverse impact.
- Impacts to cultural resources associated with the creation of a central utility plant would be evaluated at the time of project design.
- There would be no indirect impacts.

ALTERNATIVE F

- Construction activities would result in direct, short-term, moderate to major, adverse impacts.
- The new Visitor Center entrance may result in long-term, moderate adverse impacts to the Castle.
- The small opening that would be inserted on the west plaza wall of the Hirshhorn would create, long-term, minor adverse impacts.
- Major, indirect, long-term impacts from the changes to the Hirshhorn Sculpture Garden and the reconfiguration of tunnel would result in moderate, long-term, adverse impacts.
- Reconfiguration of the Haupt Garden and removal and replacement of the Quadrangle Museum Pavilions would result in direct, long-term, major, adverse impacts by improving visibility.
- Removal of the pavilions would result in a long-term, major, adverse impact to the Quadrangle building.

- Removal and replacement of skylights would result in a long-term, moderate adverse impact.
- Impacts to cultural resources associated with the creation of a New Visitor Center, central utility plant, sub-basement excavation of the Castle, and excavation for a new loading ramp would be evaluated at the time of project design.
- There would be no indirect impacts.

ES.3.7 IMPACTS ON VISUAL QUALITY

NO-ACTION ALTERNATIVE

- Direct, short-term, negligible, adverse impacts due to minor renovations.
- There would be no indirect impacts.

ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

- Direct, short-term, negligible, adverse impacts from construction activities.
- Direct, long-term, minor, adverse impact from new Visitor Center entrance.
- Removal of Ripley Pavilion and the addition of permanent security design would result in direct, long-term, minor, beneficial impacts.
- Rehabilitation of the Castle would result in negligible, long-term, adverse impacts.
- There would be no indirect impacts.

ALTERNATIVE B

- Direct, short-term, negligible, adverse impacts from construction activities.
- Direct, long-term, minor adverse impacts from the creation of a small opening in the Hirshhorn Plaza and the restoration of the Hirshhorn tunnel.
- Reconfiguration of the Haupt Garden would result in direct, long-term, minor to moderate adverse impacts.
- There would be no indirect impacts.

ALTERNATIVE D

- Direct, short-term, negligible, adverse impacts from construction activities.

- Below-grade “dip” entrance to the Visitor Center would result in direct, long-term, major adverse impacts to the Castle.
- Reconfiguration of the Haupt Garden would result in direct, long-term, beneficial impacts by improving visibility and long-term, minor to moderate, adverse impacts by altering the secluded nature of the Garden and the addition of vents for the central utility plant.
- Direct, long-term, minor adverse impacts from the removal of plaza walls at the Hirshhorn and the raising of the Sculpture Garden would result in moderate, long-term, adverse impacts.
- Moderate, indirect, long-term impacts from the changes to the Hirshhorn Sculpture Garden.

ALTERNATIVE F

- Direct, short-term, negligible, adverse impacts from construction activities.
- Below-grade entrance to the Visitor Center would result in direct, long-term, moderate adverse impacts to the Castle.
- Reconfiguration of the Haupt Garden would result in direct, long-term, beneficial impacts by improving visibility and long-term, minor to moderate, adverse impacts by altering the secluded nature of the Garden and the addition of vents for the central utility plant.
- Direct, long-term, minor adverse impacts from the creation of a small opening in the Hirshhorn Plaza and the raising of the Sculpture Garden would result in minor to moderate, long-term, adverse impacts.
- Minor, indirect, long-term impacts from the changes to the Hirshhorn Sculpture Garden.

ES.3.8 IMPACTS ON LAND USE PLANNING & POLICIES

NO-ACTION ALTERNATIVE

- No Impacts.

ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

- Direct and indirect, long and short-term moderate, beneficial impacts by complimenting other planning efforts.

ALTERNATIVE B

- Alternative B would have a minor to moderate, long-term, adverse impact in strengthening the connection of the South Mall Campus to the SW Ecodistrict as it would continue to block out of the neighborhood across Independence Avenue, SW from within the site and continue to block views into the gardens and to the Castle from outside.

ALTERNATIVE D

- A moderate, long-term, beneficial impact would occur by strengthening the connection of the South Mall Campus to the SW Ecodistrict and would increase views into the gardens and to the Castle from outside. It would be consistent with the SW Ecodistrict goals for a pedestrian-oriented development and improved connection to public space. Due to impacts to the historic character of the South Mall Campus, this alternative may not be fully consistent with the Urban Design or Historic Preservation Elements of the Comprehensive Plan. It would restore and renovate historic buildings consistent with the National Mall Plan's cultural resource goals.

ALTERNATIVE F

- A moderate, long-term, beneficial impact would occur by strengthening the connection of the South Mall Campus to the SW Ecodistrict as it would continue to block out of the neighborhood across Independence Avenue, SW from within the site and would increase views into the gardens and to the Castle from outside. Alternative F is consistent with the Comprehensive Plan and SW Ecodistrict Plan goals for pedestrian-oriented development and for improved connections to public space, and the most consistent with the Urban Design and Historic Preservation Elements of the Comprehensive Plan. It would restore and renovate historic buildings consistent with the National Mall Plan's cultural resource goals.

ES.3.9 IMPACTS ON TRAFFIC AND TRANSPORTATION

NO-ACTION ALTERNATIVE

- There would be long-term, negligible, adverse impacts from development in the area. The No-Action Alternative would not add any traffic.

ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

- Would not result in additional vehicular, bicycle, pedestrian, or transit trips.

ALTERNATIVE B

- Direct, long-term, negligible, adverse impacts from a minor increase in vehicular trips.
- Direct, long-term, negligible, adverse impacts from a minor increase in bicycle, pedestrian, and transit trips.

ALTERNATIVES D AND F

- Direct, long-term, negligible, adverse impacts from a minor increase in vehicular trips.
- Direct, long-term, negligible, adverse impacts from a minor increase in bicycle, pedestrian, and transit trips.

ES.3.10 IMPACTS ON VISITOR USE & EXPERIENCE

NO-ACTION ALTERNATIVE

- Direct, long-term, moderate, adverse impacts from lack of improvements to the Campus.

ALTERNATIVE B

- Direct and indirect, short-term, minor, adverse impacts from noise and access disruptions.
- Direct, long-term, minor, beneficial impacts from Campus improvements.

ALTERNATIVE D

- Direct and indirect, short-term, minor, adverse impacts from noise and access disruptions.
- Direct, long-term, moderate, beneficial impacts from Campus improvements.

ALTERNATIVE F

- Direct and indirect, short-term, minor, adverse impacts from noise and access disruptions.
- Direct, long-term, major, beneficial impacts from Campus improvements.

ES.3.11 IMPACTS ON HUMAN HEALTH AND SAFETY

NO-ACTION ALTERNATIVE

- Direct, long and short-term, minor, adverse impacts from the disturbance of hazardous materials and lack of security upgrades.
- Direct, long-term, minor, beneficial impact from removal of hazardous materials.

ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

- Direct, short-term, minor, adverse impacts from the disturbance of hazardous materials and safety hazards during construction.
- Direct, long-term, minor, and moderate, beneficial impact from removal of hazardous materials and installation of Campus seismic and blast protection.
- Direct, long-term, major, beneficial impacts would result from security upgrades including blast protection, perimeter security elements, and visitor screening upgrades.

ALTERNATIVE B

- Direct, short-term, minor, adverse impacts from the disturbance of hazardous materials and safety hazards during construction.
- Direct, long-term, minor, and moderate, beneficial impact from removal of hazardous materials and installation of Campus seismic and blast protection.

- Direct, long-term, moderate, beneficial impacts would result from security upgrades including blast protection, perimeter security elements, and visitor screening upgrades.
- Does provide adequate daylight for staff that would result in minor, long-term, adverse impacts.

ALTERNATIVES D AND F

- Direct, short-term, minor, adverse impacts from the disturbance of hazardous materials and safety hazards during construction.
- Direct, long-term, minor, and moderate, beneficial impact from removal of hazardous materials and installation of Campus seismic and blast protection.
- Direct, long-term, major, beneficial impacts would result from security upgrades including blast protection, perimeter security elements, and visitor screening upgrades.

ES.3.12 IMPACTS ON UTILITIES

NO-ACTION ALTERNATIVE

- Continual need to repair utilities would result in direct, long-term, minor, adverse impacts.
- Remaining on GSA steam and chilled water would result in indirect, long-term, moderate, adverse impacts to SI collections.

ALL MASTER PLAN ALTERNATIVES

- Direct, short-term, negligible, adverse impacts from temporary increase in utility demand.
- Direct and indirect, long-term, moderate, beneficial impact from overall reduction in utility use.
- Indirect, short-term, minor, adverse impacts from disruption to utilities.

ES.3.13 IMPACTS ON WASTE MANAGEMENT

NO-ACTION ALTERNATIVE

- No impacts.

ALL MASTER PLAN ALTERNATIVES

- Direct, short-term, minor, adverse impacts from increased waste generation during construction.
- Direct, long-term, moderate, beneficial impacts from streamlined waste management.
- Indirect, short and long-term, negligible, adverse impacts from waste generated on the Campus.

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APPENDICES

Appendix A – Consultation and Coordination

Appendix B – Consulting Parties – Assessment of Effects

Appendix C – Public Scoping Report

ACRONYMS

AADT	Annual Average Daily Traffic	EA	Environmental Assessment
ACHP	Advisory Council on Historic Preservation	EIS	Environment Impact Statement
ACM	Asbestos Containing Material	EO	Executive Order
ADA	American's with Disabilities Act	EPA	Environmental Protection Agency
AIB	Arts and Industries Building	ESA	Endangered Species Act
ANC	Area Neighborhood Commission	FEMA	Federal Emergency Management Agency
APE	Area of Potential Effect	FEMS	Fire and Emergency Medical Services
ASCE	American Society of Civil Engineers	FHWA	Federal Highway Administration
BIG	Bjarke Ingles Group	FIRM	Flood Insurance Rate Map
BMP	Best Management Practices	FR	Federal Register
CAA	Clean Air Act	FSL	Facility Security Level
CEQ	Council on Environmental Quality	FY	Fiscal Year
CFA	Commission of Fine Arts	GAR	Green Area Ratio
CFR	Code of Federal Regulations	GDP	Gross Domestic Product
CH ₄	Methane	GHG	Greenhouse Gas
CLR	Cultural Landscape Report	GSA	General Services Administration
CO	Carbon Monoxide	HCM	Highway Capacity Manual
CSS	Combined Sewer System	HCS	Highway Capacity Software
CWA	Clean Water Act	HOTD	Heating Operations and Transmission District
CZMA	Coastal Zone Management Act	HUD	Housing and Urban Development
dbA	Decibels (A-weighted scale)	IBC	International Building Codes
DC	District of Columbia	IEBC	International Existing Building Codes
DCMR	DC Municipal Regulations	IPaC	Information for Planning and Conservation
DCOP	DC Office of Planning	ISC	Interagency Security Committee
DDOT	District Department of Transportation	LBP	Lead Based Paint
DOEE	District Department of Energy and Environment	LOMR	Letter of Map Revision

LOS	Level of Service	OSHA	Occupational Health and Safety
MPD	Metro Police Department	Pb	Lead
MS4	Municipal Separate Storm Sewer System	PCBs	Polychlorinated Biphenyls
MTA	Maryland Transit Authority	PM ₁₀	Particulate Matter
MWCOG	Metropolitan Washington Council of Governments	PM _{2.5}	Particulate Matter
NAAQS	National Ambient Air Quality Standards	PRTC	Potomac and Rappahannock
NASM	National Air and Space Museum	ROD	Record of Decision
NCPC	National Capital Planning Commission	RP	recommended practice
NEPA	National Environmental Policy Act	SD	Smithsonian Directive
NESHAP	National Emissions Standards for Hazardous Air Pollutants	SFWG	Sustainably Facilities Working Group
NHD	National Hydrography Dataset	SHPO	State Historic Preservation Office
NHPA	National Historic Preservation Act	SI	Smithsonian Institution
NMAfA	National Museum of African Art	SIP	State Implementation Plan
NMNH	National Museum of Natural History	SO ₂	Sulfur Dioxide
NO ₂	Nitrogen Dioxide	SOM	Skidmore, Owings, and Merrill
NOAA	National Oceanic and Atmospheric Association	SWMP	Stormwater Management Plan
NOI	Notice of Intent	TCP	Traditional Cultural Properties
NO _x	Nitrous Oxides	USACE	US Army Corps of Engineers
NPS	National Park Service	USC	United States Code
NRCS	Natural Resource Conservation Service	USDA	US Department of Agriculture
NRHP	National Register of Historic Places	USFWS	US Fish and Wildlife Service
NWI	National Wetlands Inventory	USGS	US Geological Survey
O ₃	Ozone	v/c	volume to capacity
OFMR	Office of Facilities Management and Reliability	VOCs	Volatile Organic Compounds
OMB	Office of Management and Budget	WMATA	Washington Metropolitan Area Transit Authority

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CHAPTER 1

INTRODUCTION



CHAPTER 1

INTRODUCTION

The National Capital Planning Commission (NCPC), acting as lead federal agency, along with the Smithsonian Institution (SI) as the project owner, and in cooperation with the National Park Service (NPS), has prepared this Draft Environmental Impact Statement (EIS) to evaluate the potential environmental impacts associated with implementing the South Mall Campus Master Plan.

This Draft EIS has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969; the Council on Environmental Quality's (CEQ) Regulations of Implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); NCPC's implementing regulations (1 CFR § 601); and the National Capital Planning Act (40 United States Code [USC] § 8722 (a) and (b)(1)) and for individual projects (40 USC 8722 (b)(1) and (d)). SI and NCPC have prepared this report to document the evaluation of impacts from the implementation of the proposed South Mall Campus Master Plan on our environment, including natural resources such as air quality and vegetation, social resources such as community facilities and services, and cultural resources such as historic sites. NCPC and SI are also using this EIS to provide information on historic resources affected by the proposed Master Plan inside the campus and historic resources outside of the campus whose views could be affected. More information on the laws and regulations that NCPC and SI must comply with can be found at the end of this chapter.

The Master Plan would be built out over the next 20 to 30 years and individual projects would be subject to agency review at that time. Any projects or improvements that utilize NPS land on the National Mall would be subject to NPS approval. Special use permits from NPS would also be required to use NPS roads

including Jefferson Drive, SW for construction activities or movement of construction equipment and supplies.

The public is encouraged to review this document to learn more about the South Mall Campus Master Plan and its potential impacts. The public is also encouraged to provide comments on the Draft EIS and the Master Plan. A public hearing will also be held. More information on the project can be found on the project website at <http://www.southmallcampus.si.edu>.

South Mall Campus EIS Public Hearings

Monday, December 11, 2017, 5:00 PM – 7:00 PM and

Monday, December 18, 2017, 10:00 AM – 12:00 PM

National Capitol Planning Commission

401 9th Street, NW

Suite 500

Washington, DC 20004

Written comments on the Draft EIS may be sent to:

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Comments may also be submitted electronically to:

Commentsonsouthcampus@si.edu.

Comments on the Draft EIS must be postmarked by: Tuesday, January 16, 2018

1.1 WHAT IS SI PROPOSING?

SI proposes to prepare a Master Plan for its South Mall Campus to guide future short-term and long-term renovation and development of the 12-acre campus by establishing holistic planning and design principles. The proposed Master Plan would be implemented over a 20- to 30-year period beginning in 2018.

The proposed Master Plan has four primary goals:

- To preserve and protect the historic buildings and features of the Campus;
- To improve and expand visitor services and education;
- To create clear accessible entrances and connections between the museums and gardens of the South Mall Campus, the National Mall, and the neighborhood; and
- To replace aging building systems that have reached the end of their lifespan.

The centerpiece of the proposed South Mall Campus Master Plan is the revitalization of the iconic Smithsonian Institution Building (Smithsonian Castle or the Castle). Opened in 1855, the Castle now serves as a visitor information center and the headquarters of the Institution. The proposed Master Plan combines several major projects, some of which address failing infrastructure, including leaking roofs, failing mechanical systems, and inefficient energy use. Integrated planning for the projects allows the SI to optimize the connections between the museums and gardens, while taking advantage of cost and energy space saving synergies, such as shared use of utility plants and a central loading dock. The Master Plan also includes expanded visitor services, new National Mall-facing entrances, and improved east-west visibility and access.

What is a Master Plan?

A Master Plan is an integrated series of documents which present in graphic, narrative, and tabular form, the present composition of an installation and the plan for its orderly and comprehensive long-range development, generally over a period of 20 years.

1.2 WHERE IS THE SOUTH MALL CAMPUS?

The campus is located on the NPS National Mall (“National Mall”), within the monumental core of the District of Columbia. The National Mall is defined by the scale and regularity of its landscape and architectural features: a central lawn flanked by quadruple rows of American Elm trees, lined with nationally significant cultural institutions and memorial sites. SI itself is a major institutional presence on the National Mall, and through various building projects, has made a substantial contribution to its physical and architectural character. Located across Independence Avenue, SW, the Southwest Quadrant is more urban in character, with large-scale office building development, much of which is occupied by federal agencies that date to the second half of the 20th century (see Figure 1-1).

The South Mall Campus is in southwest Washington, DC, occupying land along the southern half of the National Mall. The South Mall Campus is bounded by 12th Street, SW to the west; Independence Avenue, SW to the south; 7th Street, SW to the east; and Jefferson Drive, SW to the north, which is adjacent to the National Mall. A portion of the campus (the Hirshhorn Museum Sculpture Garden and its flanking tree panels) extends beyond Jefferson Drive, SW to the north (see Figure 1-2).

The campus contains five principal buildings and four designed gardens, in addition to a myriad of subsidiary structures, interstitial landscapes, circulation features, and infrastructure. The buildings house a range of SI programs, offices, and institutions, including four major museums: the Freer Gallery of Art (Freer Gallery), the Arthur M. Sackler Gallery (Sackler Gallery), the National Museum of African Art (NMAfA), and the Hirshhorn Museum and Sculpture Garden. The Castle is the iconic heart of the Institution, and it incorporates several functions, including the office of the SI Secretary and the SI Information Center for visitors to the Smithsonian Museums on the National Mall. The Arts and Industries Building (AIB) is regularly used for events, and programming uses are currently under study.

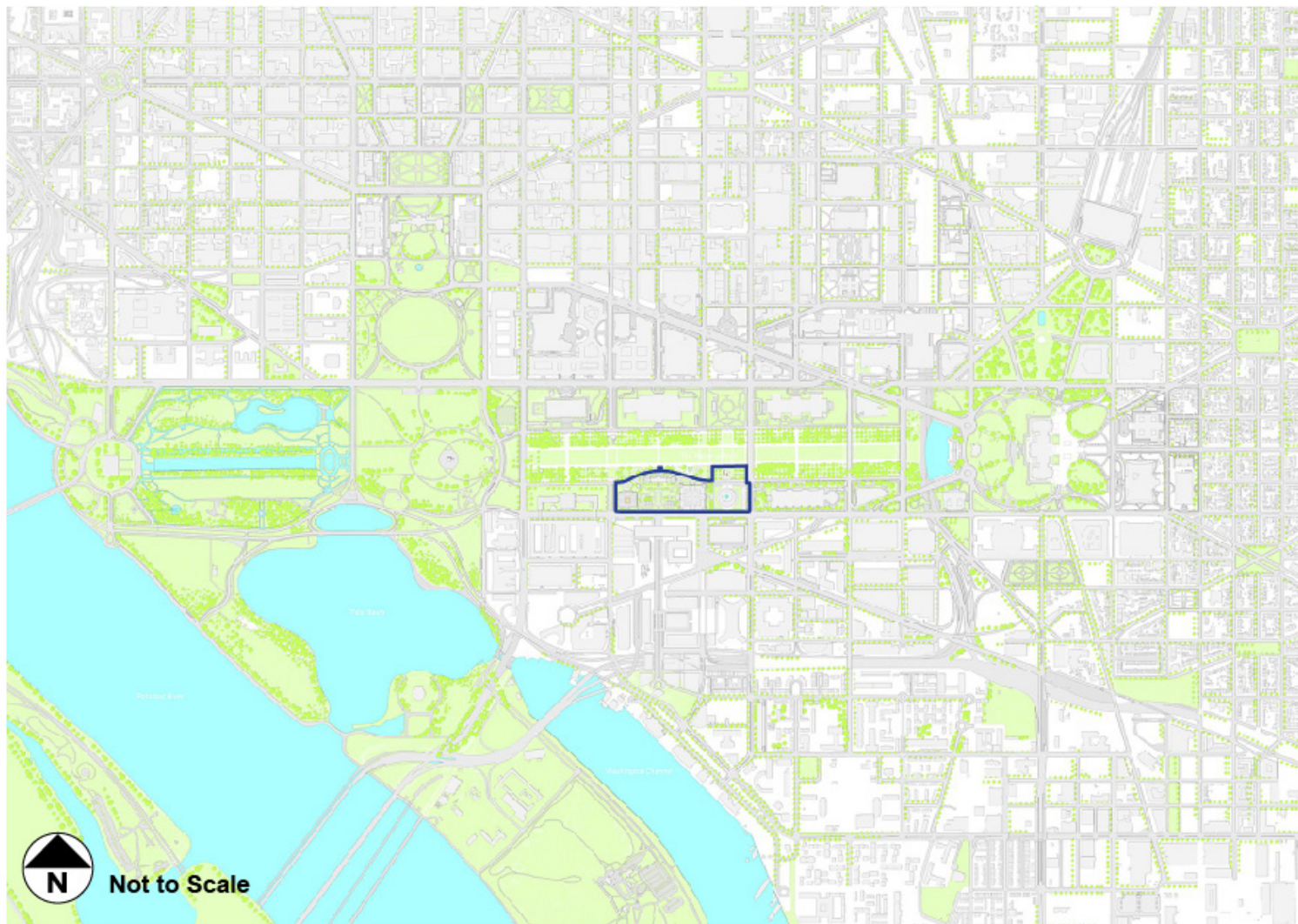


Figure 1-1. Map of the South Mall Campus and surrounding buildings.

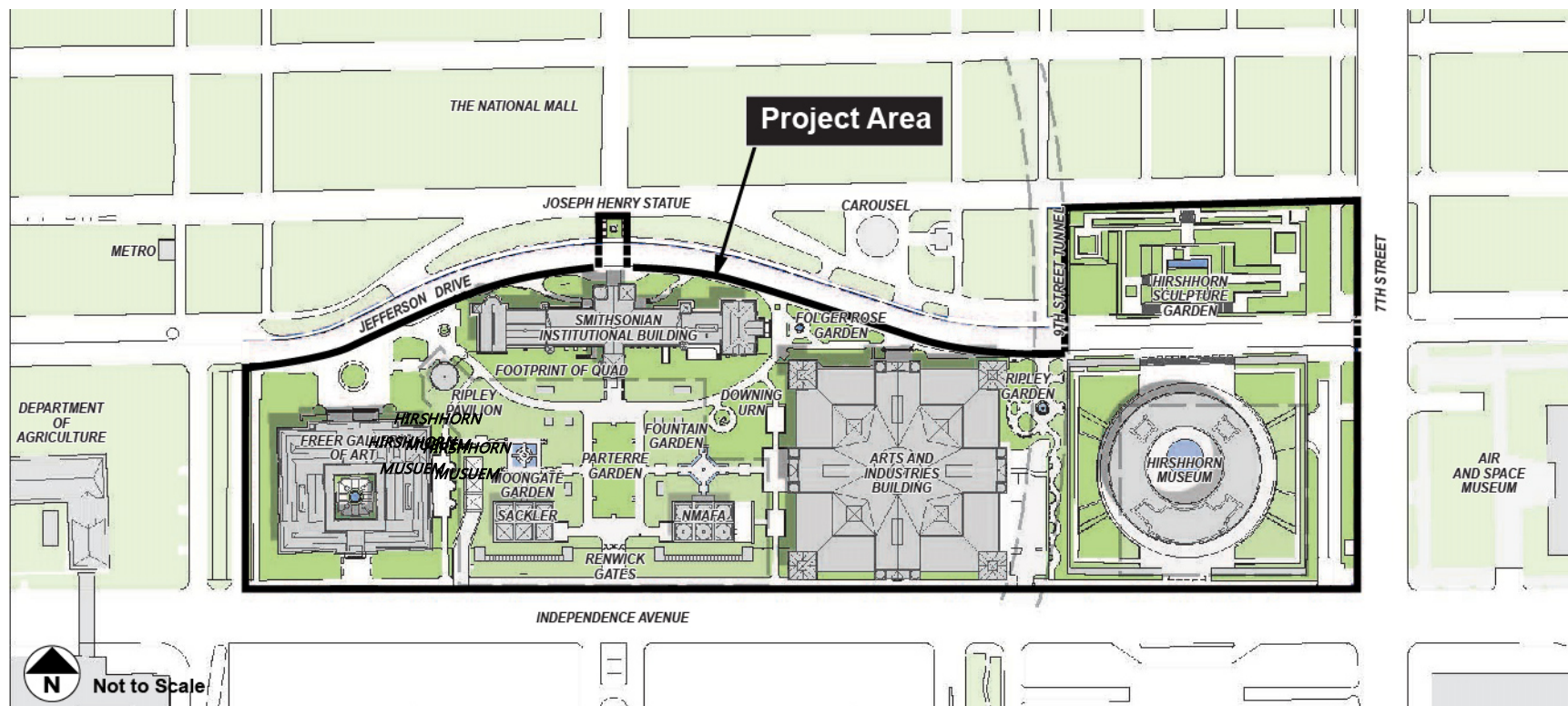
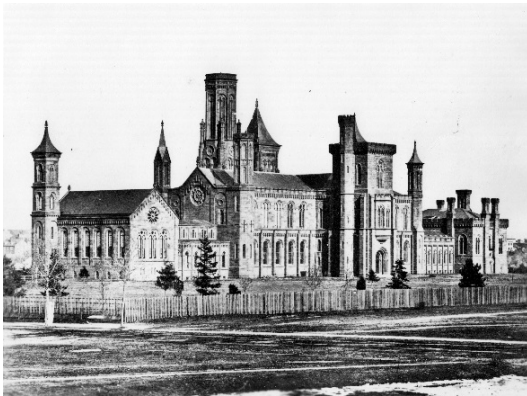


Figure 1-2. South Mall Campus Study Boundary Map.

1.3 WHAT IS THE HISTORY OF THE SOUTH MALL CAMPUS?

Smithsonian Institution Building (1855)



Smithsonian Institution Building (1855)

The enabling legislation of the Smithsonian Institution was passed by Congress and was signed into law by President James K. Polk in August 1846. The law provided structure and definition to the bequest of Englishman James Smithson, whose will gifted his estate, worth about 500,000 American dollars, to the United States of America. The 1846 legislation expanded the scope of Smithson's bequest, creating an executive structure to be governed by a Board of Regents and a Secretary. The first duty of the Board of Regents was to construct a headquarters to house the Institution. The enabling legislation stipulated that the site be chosen from the available public grounds in the City of Washington.

Following lengthy negotiations, a site for the SI's headquarters was chosen on the southern half of the National Mall between 9th and 12th Streets, SW in January 1847. The Building Committee selected the plans of James Renwick, Jr. for the Smithsonian Institution Building. Renwick, who had submitted two of 13 competition entries for the building, was a New York architect whose work—particularly in the design of several Gothic Revival churches and demeanor—had favorably impressed the committee during their national tour. James Dixon & Co. of Washington was chosen to construct the building. With great fanfare, the cornerstone of the Castle was laid on May 1, 1847. The building was constructed and occupied in several stages, but was fully complete in 1855 and is approximately 111,173 square feet (sf).

Following the construction of the Smithsonian Institution Building, the following buildings that make up the South Mall Campus were constructed:

ARTS AND INDUSTRIES BUILDING AND SURROUNDING GARDENS (FOLGER AND RIPLEY)

The AIB, which is 152,718 sf, is located southeast of the Castle and was completed in 1881 to serve as the U.S. National Museum, and displayed the collections of the Smithsonian Institution. The building was rehabilitated between 1972 and 1976 and was reopened to the public as the AIB in 1976 to coincide with the nation's Bicentennial. The two gardens surrounding the AIB, the Kathrine Dulin Folger Rose Garden (the Folger Garden) (1998) and the Mary Livingston Ripley Garden (the Ripley Garden) (1981), are located north and east of the AIB, respectively (EHT Tracerics, 2015).



Arts and Industries Building

FREER GALLERY OF ART

The Freer Gallery of Art (128,980 sf) and Courtyard, are located on the western portion of the South Mall Campus. Construction of the Freer Gallery of Art began in 1916 but, due to World War I, was not completed until 1923. The Freer Gallery of Art houses a collection of Asian and American art and is connected to the underground Sackler Gallery. The central courtyard includes a fountain. The Freer Gallery of Art and courtyard have remained largely unchanged since completion (EHT Tracerics, 2015).



Freer Gallery of Art

HIRSHHORN MUSEUM AND SCULPTURE GARDEN

Located on the eastern portion of the South Mall Campus, the Hirshhorn Museum is a four-story, circular building with a hollow center that forms an outdoor plaza with a large fountain. The museum was constructed between 1966 and 1974. The Sculpture Garden is located to the north of the Hirshhorn Museum across Jefferson Drive, SW. Approximately 50 pieces of sculpture are on display at any given time in the Sculpture Garden and on the Hirshhorn Plaza. The pieces are irregularly displayed and are periodically alternated or moved. An underground tunnel (the "tunnel") formerly connected the Hirshhorn Museum and Sculpture Garden; however, that space has since been enclosed and serves as a multimedia arts education center (EHT Tracerics, 2015). The Hirshhorn Museum and Sculpture Garden are 149,158 sf.



Hirshhorn Museum

QUADRANGLE BUILDING



Quadrangle Complex & Enid A. Haupt Garden

The Quadrangle Building is a predominately below-ground structure accessed from three above-ground pavilions. The Enid A. Haupt Garden sits on the “roof” of the Quadrangle Building below. The Quadrangle Building (332,681 sf), its pavilions, and the Haupt Garden were constructed from 1983 to 1987. The pavilions include the S. Dillion Ripley Center Pavilion, which is located in the northwest corner of the Haupt Garden; the Arthur M. Sackler Gallery Pavilion, located in the southwest corner of the Haupt Garden; and the National Museum of African Art Pavilion (NMAfA), located in the southeast corner of the Haupt Garden. The pavilions and Garden have remained largely unchanged since completion (EHT Tracerics, 2015).

1.4 WHAT IS THE BACKGROUND & HISTORY OF THE PROJECT?

In spring 2012, prior to engaging an architectural team for the South Mall Campus Master Plan, the SI conducted a facilitated retreat with a Steering Committee drawn from senior SI leadership (including representation from the Secretary; Regents Facilities Committee; Assistant Secretary for Education and Access; Undersecretaries for Science and History, Art, and Culture; Chief of Staff to the Secretary, Director of Advancement and Philanthropic Giving; General Counsel; museum directors; and other senior leaders) to develop a statement of project goals and priorities for the South Mall Campus. The goals as outlined previously in Section 1.1 are:

- To preserve and protect the historic buildings and features of the South Mall Campus;
- To improve and expand visitor services and education;
- To create clear accessible entrances and connections between the museums and gardens of the South Mall Campus, the National Mall, the neighborhood; and
- Replace aging building systems that have reached the end of their lifespan.

Using the statement of project goals, the SI held a qualification-based federal selection process to select an architectural team (SI, 2012). A team led by the New York City office of Bjarke Ingels Group (BIG) was selected as the Master Plan architect towards the end of 2012 and began working with the SI Facilities staff and the Steering Committee in spring 2013.

BIG began developing the Master Plan through extensive engagement and discussion with SI to identify needs, priorities, and values for the South Mall Campus that were in line with the goals previously established for the Master Plan. BIG and SI's Facilities staff interviewed members of the Steering Committee and other key staff to determine priorities for the plans and to identify existing and future project needs. As the vision for the South Mall Campus developed over a one-year period, the Steering Committee members were repeatedly engaged through a series of meetings to present and discuss major issues, findings, and solutions. These were synthesized into seven key priorities described below.

1. Enter & Experience – Make points of entry clearer, more accessible, and easier to find through improved orientation, wayfinding, and location.
2. Upgrade the Underground – Better utilize the existing below-grade space through clearer circulation, increased daylighting, and easier access to amenities.
3. Activate the Afterhours – Provide the experiential, program, and technical capacity to support active nightlife within the South Mall Campus museums and gardens.
4. Expand Education – Update and expand educational facilities to provide greater flexibility, incorporate new technology, and connect with other SI programs.
5. Engage the Gardens – Capitalize on the beauty and popularity of the existing gardens by improving circulation, providing better maintenance facilities, integrating with museum programs, and expanding their ability to accommodate large groups.

6. Connect the Campus – Improve circulation across the campus to encourage entry from the National Mall, facilitate east-west pedestrian flow both at- and below-grade, and remove impediments to a connected campus.
7. Convene & Collaborate – Provide opportunities and venues for pan-Institutional collaboration, meetings, and events.

The resulting vision for the South Mall Campus Master Plan evolved throughout this process and is reflective of intense and iterative dialogue between the SI and the Master Plan team. The seven key priorities shaped the purpose and need for the proposed Master Plan.

1.5 WHAT IS THE PURPOSE OF PREPARING A MASTER PLAN FOR THE SOUTH MALL CAMPUS AND WHY IS IT NEEDED?

The purpose of a proposed South Mall Campus Master Plan is to guide future short-term and long-term renovation and development of the 17-acre area known as the South Mall Campus, which includes the Castle, the Quadrangle Building (the Ripley Center, the Sackler Gallery, the NMAfA, and the rooftop Enid A. Haupt Garden), the Freer Gallery, the AIB, the Hirshhorn Museum and Sculpture Garden, the Folger Garden, and the Ripley Garden.

The Master Plan is needed to meet SI's long-term space requirements and to address physical and operational deficiencies across the campus that impact visitor use and experience as well as SI's ability to implement its programs effectively and safely. SI identified the following needs for the campus:

- Restore, repair, and rehabilitate historic properties;
- Replace roofs and building systems that are at the end of their useful lives;
- Improve accessibility and usability by individuals with disabilities;

- Improve circulation throughout the campus, including creation of a clear east-west at-grade pedestrian connection from the east side of the Freer Gallery to the Hirshhorn Museum Plaza;
- Improve access and visibility from the National Mall and the Castle for the NMAfA and Sackler Gallery entrances;
- Create expanded and linked centralized visitor services and education spaces;
- Provide additional museum and event space;
- Establish a new central utility plant and related infrastructure to reduce energy and operating costs and greenhouse gas (GHG) emissions;
- Provide expanded below grade loading and delivery facilities serving the Quadrangle Building, Castle, AIB and Freer buildings; and
- Update security measures to meet SI and federal requirements.

1.6 WHAT ELEMENTS WILL BE INCLUDED IN THE MASTER PLAN?

The Master Plan will be based on holistic planning principles and objectives for supporting the mission, responsibilities, and functions of SI, and it will document existing conditions and proposed developments and changes. The Master Plan will provide a cohesive urban design framework to guide land use and the character of future individual projects and historic preservation for buildings and landscapes. The Master Plan will include analysis of and a physical planning approach to address the needs for:

- Additional and repurposed space;
- Land and building uses;
- Adjacency requirements;
- Projected visitor and staff populations;
- Sustainable traffic, service, and parking solutions;
- Coordination for consistency with relevant SI, federal, and local plans, regulations, and policies;
- Analysis of the effects on historic resources; and

- Proposed strategies for energy conservation and storm water management.

Finally, the Master Plan will include a proposed implementation plan for projects. This will help inform SI's capital plan for federal and trust (private) funding, including projects related to temporarily or permanently relocating programs, staff, and collections as necessary to implement the Master Plan.

1.7 RELEVANT ENVIRONMENTAL LAWS AND REGULATIONS

1.7.1 WHAT IS NEPA AND THE NEPA PROCESS?

NEPA is the nation's legislative charter for protection of the environment. NEPA requires federal agencies to consider environmental impacts of their projects during federal agency planning and decision making. NEPA requires federal agencies to prepare an EIS if the project may have significant impacts or if the significance of the impacts that may result from the proposed action is unknown. This EIS has been prepared in accordance with the CEQ regulations for implementing NEPA (40 Code of Federal Regulations (CFR) 1500-1508). Public involvement is an important part of the NEPA process. Title 40 CFR Part 1500.1(b) states, "NEPA procedures must ensure that environmental information is available to public officials and citizens before decisions are made and before actions are taken." By involving citizens, stakeholder groups, and local, state, and federal agencies, the federal government can make better informed decisions.

Through the NEPA process, the public has had and will continue to have opportunities to comment on the proposed South Mall Campus Master Plan. As described in **Chapter 2: Public and Agency Involvement**, the public was given an opportunity to participate in the scoping process. "Scoping" is a tool for identifying the issues that should be addressed in an EIS and in accordance with Section 106 of the National Historic Preservation Act (NHPA). Scoping allows the public to help define priorities and express stakeholder and community issues

to the agency through oral and written comments. Key issues identified during scoping and scoping meetings with the public and agencies are discussed in detail in **Chapter 2: Public and Agency Involvement**.

NCPC and SI have considered impacts to these and other resources in this Draft EIS and are now asking for the public and government agencies to comment on the analysis. During this review period, NCPC and SI will hold a public hearing on Monday, December 11, 2017 from 5:00 to 7:00PM at the NCPC to provide an opportunity for the public to learn more about the project and its potential impacts and to document their comments and concerns about the content of the Draft EIS.

1.7.2 WHAT IS SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT?

The National Historic Preservation Act of 1966 (NHPA) requires federal agencies take into account the effects of their actions on historic resources. Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) as well as interested Consulting Parties, a reasonable opportunity to comment. Under the historic preservation review process mandated by Section 106 of the NHPA as outlined in regulations issued by the ACHP (CFR 36 § 800.4), SI must evaluate the undertaking to determine if it is a type of activity that could affect historic properties, which are defined as a district, site, structure, building, or object listed in or eligible for listing in the National Register of Historic Places (NRHP). The entire South Mall Campus is located within the National Mall Historic District, which is listed in the DC Inventory of Historic Sites and the NRHP. The Freer Gallery, the Castle, and the AIB are individually listed on the DC Inventory and the NRHP. The Castle and AIB buildings have additionally been designated as National Historic Landmarks. The Smithsonian Quadrangle Historic District was recently listed on the DC Inventory, and encompasses the Quadrangle Building, Castle, Freer Gallery, and

The **National Register of Historic Places** is the nation's official list of cultural resources worthy of preservation. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture.

National Historic Landmarks are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States.

AIB. The Hirshhorn Museum and Sculpture Garden has been determined eligible for the National Register and the National Register nomination is currently underway. The entire campus is set within the framework of the Plan of the City of Washington, which is listed on the DC Inventory and in the NRHP

Section 106 review encourages preservation of historic properties; however, at times, impacts to historic resources cannot be avoided. When an undertaking must impact historic resources, the federal government is required to consult with local, state, and federal agencies responsible for historic preservation, local citizens, and groups with an interest in historic preservation. Opportunities for public comment on historic preservation issues were provided during scoping and Consulting Parties meetings held between 2014 and the present. The public is also encouraged to comment on historic preservation issues during the public review period of this Draft EIS.

Additional information regarding Section 106 consultation can be found in **Chapter 2: Public and Agency Involvement**.

1.7.3 WHAT OTHER ENVIRONMENTAL LAWS AND REGULATIONS ARE RELEVANT TO THIS PROJECT?

NCPC and SI must comply with all applicable federal, state and local laws and regulations. NCPC and SI are incorporating compliance with these laws and regulations into their project planning and NEPA compliance. A listing of these laws and regulations can be found in the box below.

STATUTES, REGULATIONS, PLANS, AND EXECUTIVE ORDERS

Statutes

Clean Air Act of 1970 as amended (42 U.S.C. § 7401, et seq.)
Clean Water Act of 1977 as amended (33 U.S.C. § 1251, et seq.)
Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 U.S.C. § 9601, et seq.)
Archaeological Resources Protection Act of 1979 (16 U.S.C. § 470aa-mm)
Endangered Species Act of 1973 (16 U.S.C. § 1531-1544)
Section 5 of the National Capital Planning Act of 1952 (82 P.L. 592; 66 Stat. 781, et seq.); (codified as amended at 40 U.S.C. § 8722(b)(1))
Resource Conservation and Recovery Act of 1976 (42 U.S.C. § 6901, et seq.)
National Energy Conservation Policy Act (42 U.S.C. § 8231, et seq.)
Energy Independence and Security Act (42 U.S.C. § 17001, et seq.)
National Historic Preservation Act of 1966 (16 U.S.C. § 470, et seq.) (89 P.L. 665 (1966)); (referred to herein as "Section 106")

Regulations

Council on Environmental Quality Regulations (40 Code of Federal Regulations Parts 1500-1508)
36 CFR Part 800 – Protection of Historic Properties
32 CFR Part 229 – Protection of Archaeological Resources: Uniform Regulations
40 CFR 6, 51, and 93 – Conformity of General Federal Actions to State or Federal Implementation Plans
33 CFR 320-330 – U.S. Army Corps of Engineers Regulations
40 CFR Parts 300 through 399 – Hazardous Substance Regulations
Secretary of the Interior Standards and Guidelines for Archaeology and Historic Preservation (48 Federal Register 44716)

Executive Orders

Executive Order 11593 – Protection and Enhancement of the Cultural Environment
Executive Order 11988 – Floodplain Management
Executive Order 11990 – Protection of Wetlands
Executive Order 12699 – Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction
Executive Order 12898 – Environmental Justice
Executive Order 13287 – Preserve America
Executive Order 13327 – Federal Real Property Asset Management
Executive Order 13693 – Planning for Federal Sustainability in the Next Decade

1.8 WHAT INTERRELATED PLANS AND PROJECTS GUIDE THE DEVELOPMENT OF THE SOUTH MALL CAMPUS?

There are many coordinated federal, District of Columbia, and interagency planning efforts in effect in the National Mall and South Mall Campus area. NCPC, the District of Columbia, the NPS, and many other agencies and organizations share the goal of preserving and protecting the history and character of the National Mall and the SI while promoting urban growth and development in nearby areas. These interrelated efforts are summarized below.

1.8.1 WHAT INTERAGENCY PLANNING EFFORTS ARE APPLICABLE TO THE SOUTH MALL CAMPUS MASTER PLAN?

1.8.1.1 THE COMPREHENSIVE PLAN FOR THE NATIONAL CAPITAL

Development within the District of Columbia is guided by *The Comprehensive Plan for the National Capital*, which includes goals, objectives, and planning policies to direct and manage growth. This plan contains both Federal Elements and District of Columbia Elements.

The Federal Elements of the Comprehensive Plan are prepared by NCPC and provide a policy framework for the federal government in managing its operations and activity in the National Capital Region (NCPC, 2016). The Federal Elements primarily address issues related to federal property and interests in the National Capital Region. Federal Elements include:

- Urban Design
- Federal Workplace
- Foreign Missions & International Organizations
- Transportation
- Federal Environment
- Historic Preservation
- Visitors & Commemoration
- Parks & Open Space



The Comprehensive Plan for the National Capital: Federal Elements

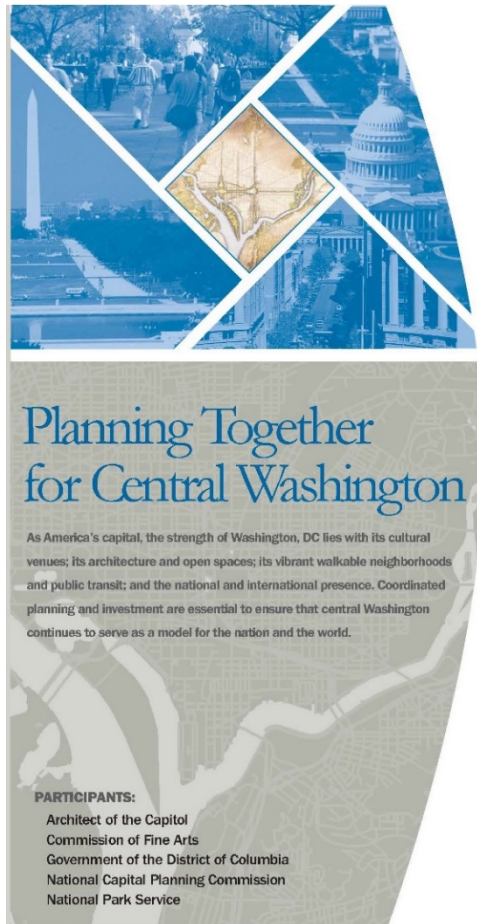
The District Elements of the *Comprehensive Plan* are prepared by the DC Office of Planning (DCOP) and provide a long-term planning framework for 13 Citywide Elements and 10 Area Elements (DCOP, 2007). DCOP is currently in the process of updating the District Elements. The citywide elements address topics that have planning implications for the entire District and include:

- Framework
- Land Use
- Transportation
- Housing
- Economic Development
- Parks, Recreation, and Open Space
- Educational Facilities
- Environmental Protection
- Infrastructure
- Urban Design
- Historic Preservation
- Community Services and Facilities
- Arts and Culture

Goals such as improving pedestrian access, security, and supply delivery are outlined throughout both the Federal and District Elements of the *Comprehensive Plan* and are in line with SI's goals for the South Mall Campus.

1.8.1.2 PLANNING TOGETHER FOR CENTRAL WASHINGTON

In 2008, the District of Columbia, NCPC, Commission of Fine Arts (CFA), NPS, and the Architect of the Capitol prepared separate, but overlapping, planning initiatives to establish central Washington, DC as the centerpiece of the region (the *Center City Action Agenda*, the *Framework Plan*, the *National Mall Plan*, and the *Capitol Complex Master Plan*). These agencies collaborated on the Planning Together for Central Washington brochure to establish common objectives and priorities (NCPC, 2008). Overall, these plans have five of the core objectives in common:



Planning Together for Central Washington

1. Creating a welcoming atmosphere in central DC that is equally attractive to all types of visitors and residents;
2. Connecting key destinations and public space throughout the city by removing barriers and increasing walkability and transit options;
3. Creating and revitalizing neighborhoods and distinctive public spaces to maintain the cultural dignity of America's beloved landmarks and government buildings;
4. Creating a livable, healthy, and sustainable urban environment by reducing emissions and pollutants, planting trees, connecting open spaces, encouraging green building practices, and conserving water and energy; and
5. Establishing a comprehensive, efficient, convenient, and integrated public transit network.

The objectives highlighted in the brochure support SI's vision for the South Mall Campus.

1.8.2 WHAT NATIONAL CAPITAL PLANNING COMMISSION PLANS ARE APPLICABLE TO THE SOUTH MALL CAMPUS MASTER PLAN?

1.8.2.1 SW ECODISTRICT PLAN

The *SW Ecodistrict Plan*, approved by NCPC in 2013, is a comprehensive approach to revitalize an isolated federal precinct in southwest Washington, DC into a sustainable, connected, mixed-use neighborhood by 2030 (NCPC, 2013). The SW Ecodistrict is a 110-acre area located immediately south of the South Mall Campus project area, bounded by Independence Avenue, SW to the north, Maine Avenue, SW to the south, 12th Street, SW to the west, and 4th Street, SW to the east. The area consists of eight federal buildings, including the Federal Aviation Administration, General Services Administration (GSA), US Department of Housing and Urban Development, US Department of Energy, and US Postal Service offices, as well as eight privately owned buildings and three parks administered by the NPS. The plan recommends district-scale sustainable

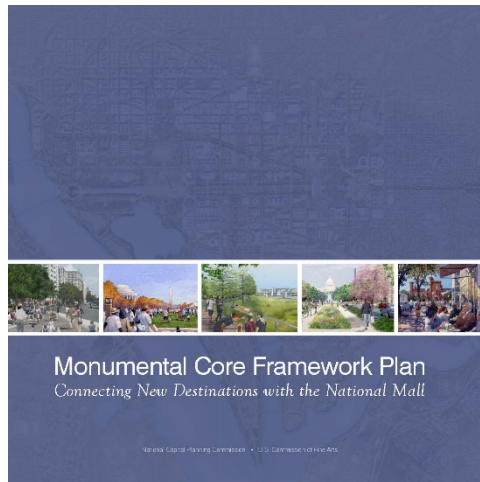
practices to integrate land use, public transit and transportation, and environmental planning with high-performance buildings, landscapes, and infrastructure, rather than traditional single-building-scale strategies. The plan also seeks to extend the civic qualities of the National Mall to the waterfront and Benjamin Banneker Park and establish new cultural destinations such as museums and memorials in the SW Ecodistrict. As part of the Plan and GSA's redevelopment plan for this area, the Department of Energy building would be transferred out of federal ownership and redeveloped. The buildings along the south side of Independence Avenue, SW could potentially be taller and closer to Independence Avenue, SW. An addendum to the SW Ecodistrict Plan was issued in September 2014 to incorporate follow-up studies and other plans since 2013 (NCPC, 2014). Ultimately, the implementation of the SW Ecodistrict Plan will increase area connectivity, including to and from the National Mall and the South Mall Campus.



SW Ecodistrict Plan



Extending the legacy Plan



The Monumental Core Framework Plan

1.8.2.2 EXTENDING THE LEGACY PLAN

The *Extending the Legacy Plan* (Legacy Plan) is a District-wide plan that proposes to extend the monumental core of the city into all quadrants of the District to reduce development pressure around the historic National Mall and surrounding areas (NCPC, 1997). By doing so, the South Mall Campus will be able to retain its character and open space. The Legacy Plan, which was introduced in 1997, encourages federal development of museums, memorials, and office buildings into all city quadrants and also proposes public transit improvements to make these areas more accessible from the monumental core. The Legacy Plan builds upon the 1791 L'Enfant Plan and the 1901 McMillan Plan for the District. Since its inception, several proposals from the Legacy Plan have been implemented, such as the DC Circulator bus system, the revitalization of South Capitol Street, and the Yards along the Anacostia Riverfront. Current efforts include transforming the riverfront with recreational trails, parks, and commercial activity, with the goal of revitalizing the adjacent neighborhoods and improving water quality in the Anacostia River (NCPC, 2017).

1.8.2.3 MONUMENTAL CORE FRAMEWORK PLAN

The *Monumental Core Framework Plan*, prepared by NCPC and CFA in 2009, builds upon the Legacy Plan's goals to locate future cultural attractions and federal buildings outside of the immediate National Mall area into all four quadrants of the city (NCPC/CFA, 2009). Locating federal workspaces and cultural destinations in developing neighborhoods would encourage local investment and revitalize those communities. In support of this goal, the Framework Plan also establishes the need to create and strengthen connections to these new locations through infrastructure improvements, walkable corridors, and multimodal transit. Like the Legacy Plan and the Memorials and Museums Master Plan, this plan will alleviate pressure to add new memorials to the National Mall while encouraging greater accessibility.

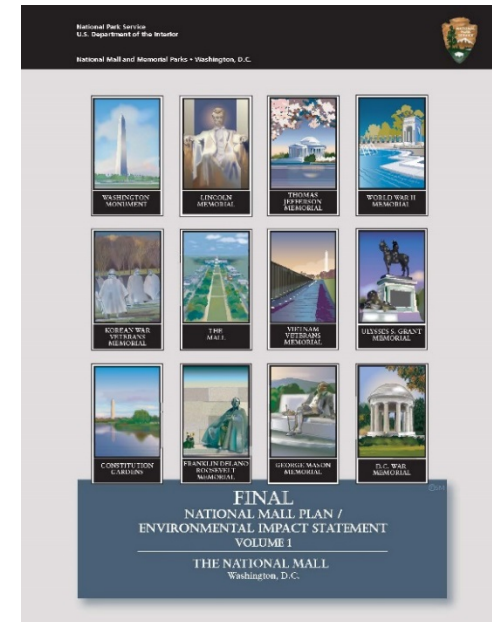
1.8.3 WHAT NATIONAL PARK SERVICE PLANS ARE APPLICABLE TO THE SOUTH MALL CAMPUS MASTER PLAN?

1.8.3.1 NATIONAL MALL PLAN

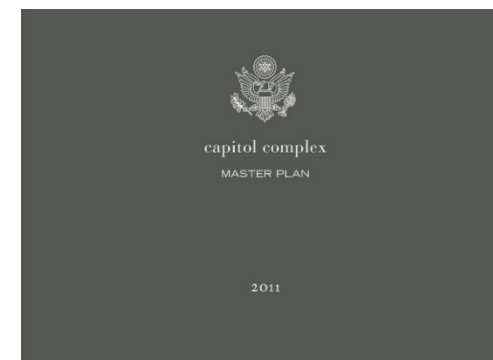
The *National Mall Plan and Environmental Impact Statement* proposes to rehabilitate and refurbish the National Mall to maintain its value as a premier civic and symbolic space (NPS, 2010a). The Plan includes strategies to rehabilitate the historic landscape, including memorials and planned views; maintain and improve the open areas of the National Mall in support of public gatherings, demonstrations, events, and other intense uses; and enhance urban recreation and sustainable urban ecology. The document evaluates the potential impacts of the Preferred Alternative, three other action alternatives, and a No-Action Alternative on cultural, natural, civic use, and socioeconomic resources in the National Mall area. The Plan was prepared by NPS, with consultation and input from several federal, regional, and District agencies, including SI. The improvements made under this plan will continue to make the National Mall a premier destination in DC and encourage visitation to the surrounding amenities such as the South Mall Campus.

1.8.4 HOW DOES THE ARCHITECT OF THE CAPITOL-CAPITOL COMPLEX MASTER PLAN APPLY TO THE SOUTH MALL CAMPUS?

The *Capitol Complex Master Plan* is a long-range plan and implementation strategy for the maintenance and rehabilitation of the Capitol Complex, including the Capitol Building, congressional office buildings, the Library of Congress, the Supreme Court, the US Botanic Garden, the Capitol Power Plant, and other federal facilities around the eastern portions of the National Mall. This plan sets forth the Architect of the Capitol's goals for stewardship, urban planning, and office and tourist needs. The overall goal of the Capitol Complex Master Plan is to ensure that Congress and the public have sustainable, safe, and high-quality facilities and grounds in which to work and visit (NCPC, 2008).



The National Mall Plan



The Capitol Complex Master Plan

Improving visitor use and experience around the National Mall supports SI's efforts on the South Mall Campus.

1.8.5 HOW DOES THE DC MULTIMODAL LONG-RANGE TRANSPORTATION PLAN (*moveDC*) APPLY TO THE SOUTH MALL CAMPUS MASTER PLAN?

The *moveDC Plan* presents a sustainable, safe, and efficient multimodal transportation network for the District that meets the needs of residents, commuters, and visitors for the next 25 years. The plan aims to expand transportation choices throughout the city, improve the reliability of all transportation modes, strengthen connections between neighborhoods, and address congestion in the monumental core and downtown areas of the District. *moveDC* will improve visitor use and experience at the South Mall Campus by providing reliable, efficient, and safe transportation options for campus visitors.



MoveDC

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CHAPTER 2

PUBLIC AND AGENCY INVOLVEMENT



CHAPTER 2

NEPA PUBLIC INVOLVEMENT PROCESS

Scoping

December 16, 2014 – January 30, 2015

Public Scoping Meeting

December 16, 2014

Notice of Intent to Prepare EIS

January 13, 2016

Additional Scoping Period

January 13 – February 22, 2016

Publication of Draft EIS in Federal Register

November 17, 2017

Public Review of Draft EIS

November 17, 2017 – January 16, 2018
(60-day review)

Public Hearings

December 11, 2017 (5:00-7:00PM)
December 18, 2017 (10:00AM-12:00PM)

Publication of Final EIS

March 14 – April 13, 2018

NCPC Preliminary Hearing

March 2018

Record of Decision

June 2018

NCPC Final Hearing

May 2018

PUBLIC AND AGENCY INVOLVEMENT

2.1 HOW WERE THE PUBLIC AND GOVERNMENT AGENCIES INVOLVED IN THE PREPARATION OF THE EIS?

Recognizing that the South Mall Campus, particularly the iconic Smithsonian Castle and gardens, are of great importance to all Americans, the South Mall Master Planning effort has and will continue to emphasize open and inclusive communications to engage the public and to understand their desires and concerns. NCPC and SI began the preparation of an Environmental Assessment (EA) in 2014 for the proposed South Mall Campus Master Plan. In September 2014, SI Facilities staff met with representatives of DC and federal external agencies and neighbors, including CFA, NCPC, DCOP, District Department of Transportation (DDOT), the US Department of Agriculture, the GSA, and the NPS among others, to introduce them to the project as a first step in the public phase of input to the plan.

As part of the EA process, the public was given an opportunity to participate in the scoping process through a scoping meeting held at the Castle on December 16, 2014. The scoping comment period for the proposed South Mall Campus Master Plan was open from December 16, 2014 through January 30, 2015. SI and NCPC initiated the public involvement processes through the distribution of scoping letters to federal, state, local agencies, elected officials, and other interested parties. The scoping meeting provided a forum for the project team to present the proposed action to the public and explain the NEPA and Section 106 processes. The meeting included a presentation of potential Master Plan alternatives and SI and consultant staff were on hand to address additional questions and receive public comments. Based on the information obtained and additional coordination with local and federal agencies, NCPC and SI determined

that preparation of an EIS was warranted rather than an EA. NCPC issued a Notice of Intent (NOI) to prepare an EIS on January 13, 2016 and reopened the scoping period until February 22, 2016. NCPC and SI have prepared this EIS to ensure that changes to the area in and around the South Mall Campus resulting from the proposed Master Plan are assessed and to identify the significant issues related to this action.

2.2 WHAT ISSUES WERE RAISED BY THE PUBLIC AND OTHER GOVERNMENT AGENCIES DURING SCOPING AND HOW ARE THEY ADDRESSED IN THE EIS?

During the scoping period, SI received 88 comments on the proposed South Mall Campus Master Plan. The issues identified during scoping are documented in a Scoping Report included in Appendix C. The key issues include the following:

Museum accessibility:

- Concerns over removing pavilion entrances.
- Support for improved signage to address accessibility concerns.
- Opposition to underground improvements.

Budget:

- Concerns over cost of implementing the Master Plan.

Specific issues relating to the buildings on the South Mall Campus:

- Support for converting AIB to a visitor center.
- Opposition to lowering the walls surrounding the Hirshhorn Plaza.
- Support for renovations to increase access to the National Mall from the Hirshhorn.
- Opposition to altering the Freer to provide accessible access from the Haupt Garden.

Castle renovations:

- Renovations, seismic upgrades, and system updating should be top priority while preserving the historical integrity of the Castle.
- Opposition to extensive underground construction.
- Support for restoring character of the Castle to its period of significance.

Historic preservation/design concerns:

- Opposition to below-grade access to Visitor's Center, which disassociates the Castle from the Haupt Garden.
- Concerns that the design does not fit with character of the National Mall or follow historic planning documents.
- Concerns that natural light may hurt art collections housed in the Quadrangle Building.

Historic gardens:

- Opposition to changing the designs of any of the gardens in the South Mall Campus.

Environmental:

- Support for implementing renewable energy resources in design concepts.
- Request that climate change and sea-level rise should be considered in design concepts.
- Support for adding trees and vegetation to achieve environmental goals.

Comments received during the scoping period were taken into consideration during the development of the EIS.

During the scoping period, SI received comments from several special interest groups including: Committee of 100 on the Federal City, National Mall Coalition, National Trust for Historic Preservation, Waterfront Gateway Neighborhood Association, American Society of Landscape Architects, Bethesda Community Garden Club, University of Maryland, American Folk Art Museum, and the Guild

of Professional Tour Guides. SI also received scoping comments from NPS and held an informational meeting with CFA. Scoping comment letters received can be found in Appendix C.

NCPC and SI have considered the impacts to environmental and cultural resources in this Draft EIS and is now asking for public and government agencies to comment on the analysis. Individuals and agencies have 60 days to review this Draft EIS. During this review period, NCPC and SI will hold a public hearing to provide an opportunity for the public to learn more about the project and its potential impacts and to document their comments and concerns about the content of the Draft EIS. There will then be a 30-day public review period of the Final EIS, giving the public the opportunity to see how comments have been addressed.

Finally, NCPC and SI will make a decision on the Master Plan for the South Mall Campus. NCPC and SI will consider comments received on the EIS when making their decision. This decision will be documented in a Record of Decision (ROD). The ROD will outline the selected alternative for the South Mall Campus Master Plan and describe measures the SI will take to reduce impacts associated with implementation of the Master Plan.

2.3 HOW IS SI CARRYING OUT THEIR REGULATORY OBLIGATIONS UNDER SECTION 106 OF THE NHPA?

Section 106 of the NHPA requires federal agencies to afford the ACHP, the State Historic Preservation Officer (SHPO), and other Consulting Parties a reasonable opportunity to comment on a proposed project (undertaking). While SI is not a “federal agency” as defined by NEPA, SI has a responsibility to comply with Section 106 of the NHPA. SI formally initiated the Section 106 consultation with the DC SHPO for the South Mall Campus Master Plan undertaking on October 9, 2014. A list of Consulting Parties for Section 106 review was determined, and

consultation between NCPC, SI, the project team, review agencies, and Consulting Parties began in December 2014 when a joint NEPA scoping/Section 106 meeting was held and has continued through the Draft EIS preparation period. In addition to consultation at these meetings, representatives of several Consulting Parties have relayed their ideas and concerns regarding the South Mall Campus Master Plan through written communication. A list of Consulting Parties for the South Mall Campus Master Plan is included in Appendix B.

Throughout the project planning for the South Mall Campus Master Plan, NCPC and SI have been seeking input from Consulting Parties on the impacts to the historic resources and ways to avoid and minimize potential adverse effects. As the Consulting Parties meetings have progressed, NCPC, SI, and the Master Planning team have been further refining its plans for the South Mall Campus. Following the presentation of Alternative F to the Consulting Parties at its May 2017 meeting, SI considered alternative designs to incorporate the operational efficiencies of the Alternative F design in such a way that would not intensify or create new adverse effects within Alternative B. The resulting modified Alternative B incorporated a central utility plant within the unexcavated area between the existing Quadrangle and AIB. Table 2-1 provides a summary of Consulting Parties meetings held to date. Complete minutes and presentation materials for these meetings are available on the project website at www.southmallcampus.si.edu.

Table 2-1. Consulting Parties Meetings.

Consulting Parties Meeting Date	Meeting Summary
December 16, 2014	<p>The first Consulting Parties meeting was conducted jointly with the NEPA Public Scoping Meeting. The purpose of this meeting was to provide an overview of the project and its major goals and objectives. To introduce the Section 106 process, NCPC and SI defined the undertaking; presented a draft Area of Potential Effects (APE); and identified historic properties within the APE, including the findings of the ongoing Cultural Landscape Report (CLR) for the South Mall Campus. For the purposes of NEPA, NCPC and SI presented the purpose and need for the project, the potential environmental issues to be addressed in the EIS, and the preliminary alternatives to be analyzed in the EIS. They also provided information on the coordination of the Section 106 and NEPA processes. The presentation was followed by an open house in which attendees could review the alternatives under consideration, provide written or verbal comments, or ask questions.</p> <p>Comments provided by Consulting Parties and meeting attendees were recorded in the South Mall Campus Master Plan Public Scoping Report (June 2015).</p>
March 30, 2015	<p>The second Consulting Parties meeting reiterated several pieces of information from the previous meeting, including the draft APE and preliminary identification of historic properties. NCPC and SI also outlined the roles and responsibility of the Consulting Parties and the anticipated Section 106 consultation schedule.</p> <p>SI presented the Master Plan objectives, including: visitor experience, education programs, museum programs, garden programs, collections, special events and retail, historic preservation, building systems, sustainability, loading and service, safety, security, and urban design.</p> <p>Comments provided by the Consulting Parties included preservation of the campus's historic buildings, public outreach, the availability of technical reports, and seismic protection of the Castle.</p> <p>The presentation was followed by a tour of the South Mall Campus.</p>
June 9, 2015	<p>This meeting focused on a more detailed presentation of the range of alternatives being considered under the EIS and Section 106 processes. It also included a description of alternatives that had been considered but dismissed from further environmental review under the EIS. SI reiterated the historic properties within the campus area and also provided additional information on the goals and objectives that contributed to the development of the Master Plan alternatives.</p> <p>Consulting Parties asked a number of questions for additional information and clarification on the range of alternatives under consideration,</p>
October 7, 2015	<p>This meeting focused on the treatment of the Smithsonian Castle, including historic preservation, seismic protection, and programming needs. SI presented a comparative study of major museum complexes worldwide to benchmark the programmatic needs of the South Mall Campus. SI described the historic development of the Castle and how its varying degrees of integrity would correspond to treatment approaches in the building.</p> <p>SI's consulting structural engineer provided a detailed presentation of the seismic vulnerabilities of the Castle and potential mitigation options, including a comparison of conventional structural reinforcement versus base isolation. The meeting concluded with a recap of the Master Plan alternatives under consideration, illustrating specifically how closely each alternative met its programmatic area needs.</p> <p>Consulting Party comments focused on base isolation and Castle seismic protection.</p>

Consulting Parties Meeting Date	Meeting Summary
January 27, 2016	<p>This meeting focused on the findings of the CLR being prepared for the South Mall Campus. The report was being developed to document the history of the campus and to inform both long-term and immediate treatment options.</p> <p>Smithsonian Gardens also presented its ongoing mission and goals as well as its objectives for the South Mall Campus Master Plan.</p> <p>During the presentation, SI identified several major periods of development and illustrated those with historic photographs and period plan diagrams. During this meeting, SI also provided an update to the ongoing NEPA process, including loading traffic counts and the NOI to prepare an EIS.</p> <p>Consulting Parties commented on the scope and purpose of the CLR and the maintenance of Smithsonian Gardens. They also asked for additional clarification regarding the development of alternatives and the Master Plan and EIS processes.</p>
April 13, 2016	<p>This meeting provided detailed, revised alternatives based on Consulting Party comments and additional material gathered to inform the Master Plan. SI also presented an update to the inventory of historic properties within the APE and project area. Consulting Parties discussed details of the master plan alternatives and how comments would be addressed.</p>
October 26, 2016	<p>To aid in the evaluation of the undertaking's effects on historic properties, SI completed Determinations of Eligibility for listing in the NRHP for the Hirshhorn Museum and Sculpture Garden and the Quadrangle Building. The former determined that the Hirshhorn Museum was eligible for National Register-listing; the latter determined that the Quadrangle Building and landscape were not individually eligible for National Register-listing at this time. SI presented the findings of these reports and the research and evaluation process that led to their conclusions. SI also presented a consolidated matrix of historic resources within the APE.</p> <p>Consulting Parties responded to the findings presented by SI and discussed implications for the Master Plan design.</p>
May 3, 2017	<p>SI presented Alternatives E and F, developed to respond to Consulting Party comments. SI determined the design of Alternative E to be unsuccessful, and dismissed it from evaluation in the EIS. Alternative F, however, was presented in greater detail and would be carried forward for analysis. SI also presented a general update to alternatives presented previously.</p>
July 26, 2017	<p>The purpose of this meeting was to present and discuss potential adverse effects on historic resources across the master plan alternatives. The Consulting Parties offered responses to these findings and discussed approaches to avoid or minimize potential adverse effects. SI also stated that it would dismiss Alternative A from further analysis in the EIS.</p>
Spring 2018	<p>The purpose of this meeting will be to discuss the content of a Programmatic Agreement and proposed mitigation.</p>

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CHAPTER 3 ALTERNATIVES



CHAPTER 3

ALTERNATIVES

SI has developed **benchmarks** to determine if the Alternatives that SI considered, including those considered and dismissed meet the **purpose and need**.

3.1 HOW WERE THE SI SOUTH MALL CAMPUS MASTER PLAN ALTERNATIVES DETERMINED?

SI developed the Master Plan for the South Mall Campus by assembling a project team of urban planners, architects, architectural historians, environmental scientists, and engineers. In order to meet the purpose and need of the South Mall Campus Master Plan (as discussed in Chapter 1), SI has defined the following benchmarks for the Master Plan:

- Restore and renovate historic buildings;
- Replace roofs and mechanical systems that have reached the end of their useful life;
- Improve access for persons with disabilities;
- Improve circulation and connectivity within the South Mall Campus and to the SW Ecodistrict and National Mall;
- Improve visibility of the Sackler Gallery and NMAfA entrance pavilions from the National Mall and the Castle;
- Create expanded and linked visitor and education spaces;
- Provide additional museum and event space;
- Establish a new central utility plant that reduces greenhouse gas (GHG) emissions and energy cost;
- Improve and expand underground loading space; and
- Update perimeter and building security.

The Master Plan team considered a range of options for achieving the goals and meeting the purpose and need of the Master Plan. Alternatives were developed

on a spectrum from minimizing impacts on historic resources to fulfilling all benchmarks defined by the purpose and need.

During the development of the alternatives, SI engaged Consulting Parties as is required by Section 106 of the NHPA, as described in Chapter 2. Concept plans were presented on several occasions and the Consulting Parties expressed concerns and provided feedback on each concept. Consulting Parties requested SI and the Master Plan team develop or revise alternatives that:

- Reduce, or eliminate entirely, excavation that would occur beneath the Castle;
- Relocate the centralized utility plant from underneath the Castle
- Remove the realignment of Jefferson Drive;
- Eliminate connecting the Hirshhorn Museum loading dock to the consolidated loading dock which requires boring underneath the 9th Street Tunnel;
- Include a full interior restoration of the Castle;
- Preserve larger portions of the Hirshhorn Plaza walls;
- Preserve the Haupt Garden and Quadrangle Building, including the museum pavilions, garden elements, and associated landscape features;
- Remove the widening of the Independence Avenue, SW sidewalk; and
- Retain the “gardenesque” quality of the Haupt Garden as a compatible setting for the Castle and AIB.

As a result, SI and the Master Plan team developed Alternatives E and F to address the comments and concerns expressed by the Consulting Parties.

Throughout the master planning process and the development of the alternatives, the Master Plan team sought input from public and government agencies through scoping; stakeholder meetings; public meetings with Area Neighborhood Commissions (ANCs) and the general public. The Master Plan team also sought input from the Consulting Parties in accordance with the

Section 106 process. Through this Draft EIS, as described in **Chapter 1, Introduction**, NCPC and SI are again seeking comments on the alternatives and their impacts.

3.2 WHAT IS THE NO-ACTION AND WHY IS IT CONSIDERED?

Section 1502.14(d) of the CEQ's NEPA regulations requires the alternatives analysis in the EIS to "include the alternative of no action." NEPA requires federal agencies to consider the No-Action Alternative because it provides a baseline for evaluating the environmental impacts against the action alternatives. This baseline allows for a comparison of each of the South Mall Campus Master Plan Action Alternatives to what would happen if a Master Plan for the South Mall Campus was not implemented.

3.3 WHAT WOULD HAPPEN TO THE SOUTH MALL CAMPUS UNDER THE NO-ACTION ALTERNATIVE?

Under the No Action Alternative, the Smithsonian would continue to use the existing interior building spaces and exterior spaces as they do currently with minor adjustments over time to accommodate organizational changes in office areas, minor exhibit-related changes, seasonal garden changes and similar. Desired programmatic changes such as a central loading and mechanical plant would not be implemented. Programmed spaces for restrooms, kitchen, offices, and other uses that are currently impinging on the Castle Great Hall and Upper Great Hall would not be relocated. Additional visitor amenities, galleries and educational spaces would not be added to any of the buildings. Specifically, under the No-Action Alternative, the following occur (See Figures 3-1 and 3-2):

CASTLE

- Continue basic maintenance of interior and exterior façade.
- Upkeep of existing outdated and inefficient mechanical systems.

- Retain undersized and inadequate visitor services.

QUADRANGLE BUILDING AND HAUPT GARDEN

- Patch and repair of roof membrane, as required.
- Replant the Haupt Garden following Quadrangle Building roofing membrane repairs.
- Retain pavilions for each component in the Quadrangle Building with no shared or integrated services.

UTILITIES, LOADING, AND OTHER MUSEUMS

- Retain GSA steam and chilled water, which does not meet museum curatorial exhibit criteria, and continue repairs to individual outdated mechanical systems.
- Patch and repair building envelopes, as required.
- Retain undersized existing loading docks which is not currently accessible to larger vehicles and requires curbside loading. The limited size of the existing loading facility also provides inadequate separation of collections, food services, recycling, and refuse and is undersized for the three facilities it serves.

The No-Action Alternative would not meet the benchmarks for the Master Plan (found on page 3-1). Specifically, it would not:

- Replace outdated mechanical systems with a centralized and energy efficient modern system.
- Adequately serve visitor needs.
- Replace the Quadrangle Building roof.
- Provide a central loading facility.
- Improve Campus circulation, wayfinding, and accessibility.
- Restore the Castle and other museum buildings.
- Provide additional education and event space.
- Update perimeter and building security.

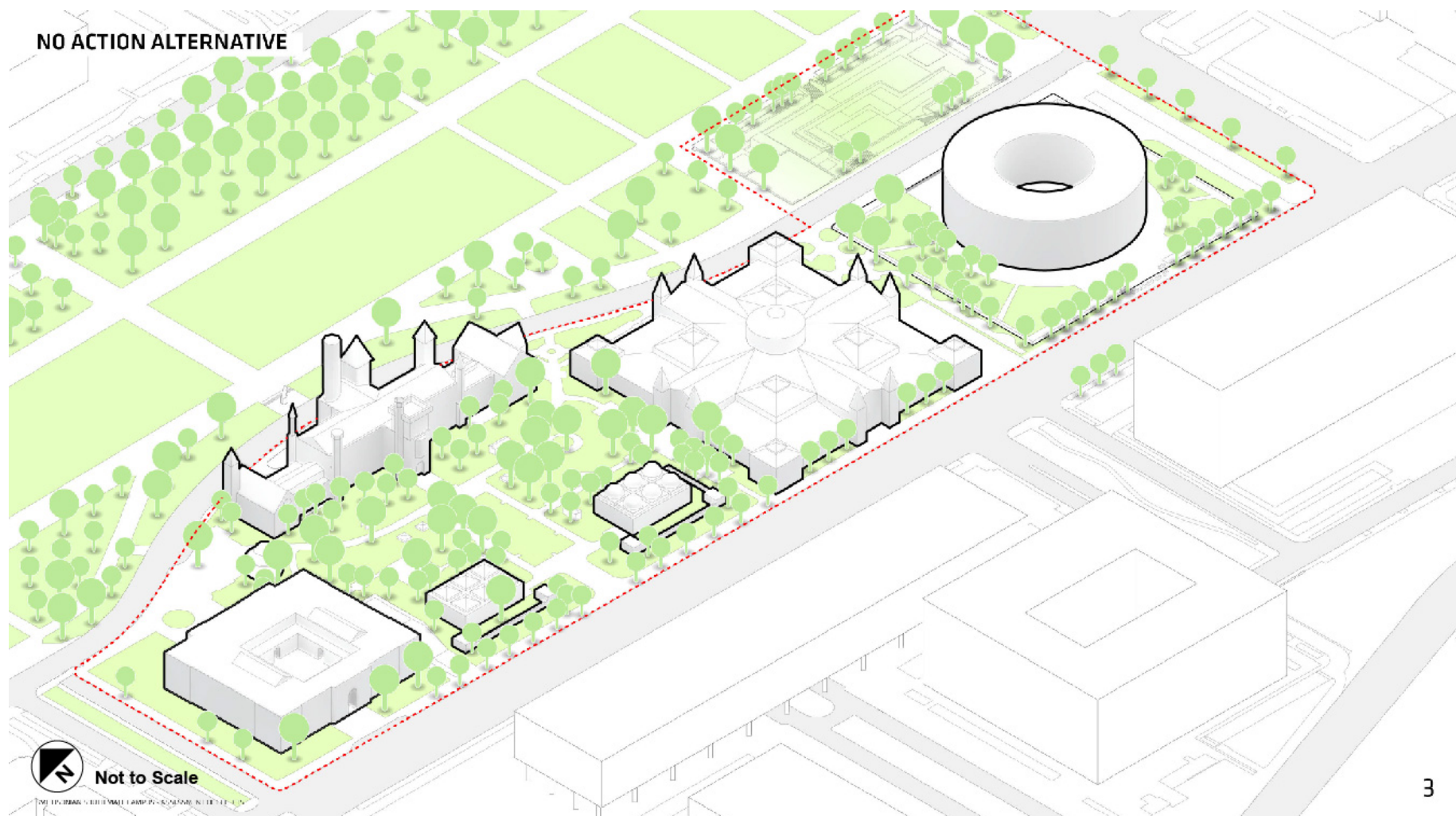
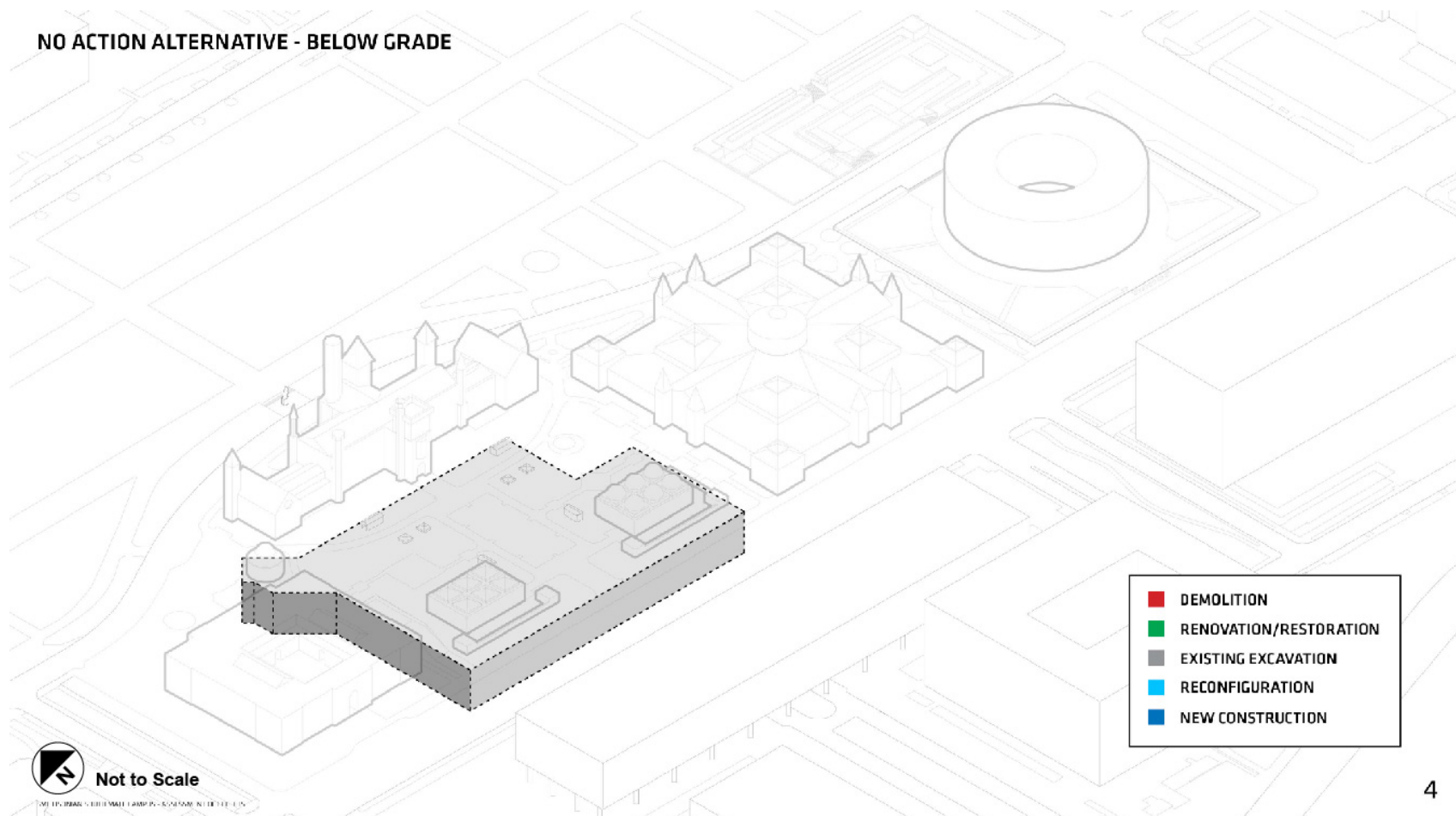


Figure 3- 1 No-Action Alternative.



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Figure 3- 2. Actions Occurring Below Grade – No-Action Alternative.

3.4 WHAT MASTER PLAN ALTERNATIVES HAS SI EVALUATED IN THIS DOCUMENT?

Below follows a discussion of Master Plan Alternatives that have been analyzed in this EIS. It was determined that these alternatives best meet the purpose and need of the project. A discussion of dismissed alternatives and justification for their dismissal can be found in Section 3.5.

3.4.1 WHAT ELEMENTS ARE COMMON TO ALL MASTER PLAN ALTERNATIVES?

SMITHSONIAN INSTITUTION BUILDING (CASTLE)

With all Action Alternatives, a permanent relocation of many of the offices now housed on upper levels of the Castle to an offsite Central Administrative Headquarters, essential to the restoration of the Upper Great Hall and its return to use by the public would occur. These large spaces would provide additional education and assembly space. Similarly, uses currently impinging on the full length of the Great Hall would be relocated to below grade spaces in the renovated Castle Basement and new Visitor Center between the Castle and Quadrangle. The east wing of the Castle would remain as office space for central Smithsonian leadership. The Schermer Lounge and Castle Commons would continue to be public space, made more useful by the lowering of the Commons floor to eliminate the need for a ramp in the Lounge. All Master Plan Alternatives would also enhance the security of the Castle through blast mitigation of the building's exterior envelope. Excavation beneath the Castle and the addition of base isolators beneath the foundation would occur to protect from seismic occurrences. The Castle would also be structurally braced to protect it from seismic occurrence, if deemed necessary. The basement floor would be lowered to provide code-compliant floor to ceiling height and the existing mechanical elements would be removed to expose the historic masonry

vaults, piers, and walks. The new lowered basement floor would allow for a connection from the basement to the new, below-grade Visitor Center south of the Castle.

FREER GALLERY OF ART

The Freer Gallery of Art remains largely unchanged with the exception of altering the east wall and historic window configuration to create an Americans with Disabilities Act (ADA) accessible entrance, the new loading ramp descending from Independence Avenue on its west side, and below grade service connections to the new loading and central utilities. Specifically:

QUADRANGLE BUILDING AND HAUPT GARDEN

Elements common to all Action Alternatives include replace the roof membrane of the Quadrangle Building and demolishing the Ripley Center entry pavilion (Ripley Center education facilities to be accessed through the new Visitor Center).

HIRSHHORN MUSEUM AND SCULPTURE GARDEN

For all Action Alternatives, the Hirshhorn Museum and Sculpture Garden retains its current public exhibits space and office areas housed in above grade levels, with the benefit of an improved building envelope and renovated mechanical systems. The Hirshhorn building would be rehabilitated. A new connecting path from its plaza to the AIB would be implemented and the Hirshhorn Plaza and the Sculpture Garden perimeter walls would be restored.

ARTS AND INDUSTRIES BUILDING

For all Action Alternatives, the AIB would continue its current use and planned improvements as a location for a variety of interim uses, special events and exhibits until renovation for a permanent use is designated by Congress,

including a potential Latino Museum for which a bill has been introduced in both the Senate and the House of Representatives. Accommodation for a permanent use of AIB has been taken into account in the sizing and location of the central loading and mechanical facilities. The non-historic east door of the AIB would be removed and the interior of the AIB would be opened to provide a continuous connection from the Haupt Garden to the Hirshhorn Plaza. The surface parking lot east of AIB would be removed to expand the Ripley Garden. Structural underpinning to the west side of the AIB foundation would be added to accommodate below-grade excavation for the central utility plant. Lastly, progressive collapse measures to address seismic vulnerability would be implemented when the building is renovated.

UTILITIES, LOADING, AND OTHER MUSEUMS

Elements common to all Master Plan Alternatives include the addition of a central mechanical plant to be located below grade between the existing Quadrangle building and the Arts and Industries Building. A central underground loading dock would be below the west end of the Castle and the Freer Gallery's north plaza would be constructed and would be accessed from a ramp to the west of the Freer Gallery. This larger loading facility would allow the current Sackler loading ramp to be removed from the Haupt Garden and would eliminate the need for the surface loading and parking lot to the east of the AIB building. Centralizing loading allows for the Smithsonian to accommodate the larger trucks used to deliver traveling exhibits and avoids the need for trucks to maneuver in the street or back down the existing one-way ramp at the Sackler. The new loading would also provide additional recycling space and storage for Smithsonian Gardens grounds keeping equipment and supplies. It would allow a more distinct separation of collections loading from other loading, improving the security and environmental protection of the

Smithsonian's national collections and collections loaned by others. Perimeter security elements would be installed around the entire South Mall Campus.

3.4.2 ALTERNATIVE B: LIMITED ABOVE GROUND CHANGE

As previously mentioned in Chapter 2, following the presentation of Alternative F to the Consulting Parties at its May 2017 meeting, SI considered alternative plans to incorporate the operational efficiencies of Alternative F in such a way that would not intensify or create new adverse effects within Alternative B. The resulting modified Alternative B incorporated a central utility plant within the unexcavated area between the existing Quadrangle and AIB.

In this alternative, above grade changes would be minimized while still accommodating improvements to the South Mall Campus' infrastructure. For the Quadrangle Building, the current museum pavilions would remain. Consideration would be given to relocating the entrances to the existing full height pavilion windows facing north to provide greater visibility from the Castle and north side of the Haupt Garden. Alterations to the Haupt Garden would be limited to replacement of the Quadrangle Building's roof membrane and improvements to circulation. To protect the Castle from seismic events, base isolation would be used in conjunction with limited reinforcement. Related to the construction of a central loading facility, the Ripley pavilion would be demolished. At the east of the Hirshhorn Museum, the Sculpture Garden wall and existing tunnel would be restored. To better segregate exhibit, event, and trash delivery / transfer an enlarged below grade central loading dock would be built.

Below grade changes would be limited to those needed to create a minimal public connection to the Visitor Center and to connect the new loading and mechanical facilities to the existing circulation and air distribution systems of the Quadrangle. Remaining portions of the former Sackler loading dock would be repurposed for back-of-house support. Smithsonian Associates offices and

NMAfA and the Sackler Gallery museum uses would be expanded into space made available by the relocation of some or all of the classroom and Discovery Theater education spaces to the new Castle Visitor Center. The connection to the Visitor Center would require further study to determine if this would still be worthwhile because of the distances involved and the conflicts created by crossing paths with museum collections circulation which occurs when the museum public entrances and circulation are not moved closer to the Castle as in Alternatives D and F. Therefore, as shown in Figures 3-3, 3-4, and 3-5, in addition to the elements that are common to all Master Plan Alternatives, under Alternative B, SI would:

CASTLE

- Excavate a limited sub-basement area beneath the west end of the building footprint to provide loading and utility support.
- Construct new below-grade Visitor Center in previously unoccupied area between Castle basement and Quadrangle Building.
- Introduce new access stairs to below-grade Visitor Center.

QUADRANGLE BUILDING AND HAUPT GARDEN

- Make minor renovations to sublevels to connect the new loading dock to existing Collections circulation system and to connect the new central utility plant to the existing distribution system.
- Reinstall the Haupt Garden, and retain existing features, after replacement of the Quadrangle Building roof membrane.
- Maintain Quadrangle Building Museum Pavilions (Sackler and NMAfA) and relocate entries to north-facing elevations of existing pavilions.

HIRSHHORN MUSEUM AND SCULPTURE GARDEN

- Remove a small portion of west-facing Hirshhorn Plaza wall to create east-west circulation.

- Restore/reopen the original tunnel connection between the Hirshhorn Plaza and Sculpture Garden.

UTILITIES AND LOADING

- Construct a new below-grade utility plant in an unexcavated area west of AIB.

Alternative B meets some of the benchmarks of the Master Plan (found on page 3-1). Specifically, these actions would:

- Restore and renovate historic buildings.
- Replace roofs and mechanical systems that are at the end of their useful life.
- Improve access for persons with disabilities.
- Update perimeter and building security.
- Establish a new central utility plant that reduces greenhouse gas emission and energy cost.
- Improve and expand underground loading space.
- Improve circulation and connectivity within the South Mall Campus.
- Enhance utilities.
- Consolidate delivery
- Provide additional program space.
- Enhance visitor amenities.

The actions under Alternative B would not meet the following Master Plan benchmarks:

- Significantly increase ADA accessibility;
- Consolidate visitor amenities in the Quadrangle Building;
- Improve daylight below grade;
- Increase museum entrance visibility;
- Secure multiple points of entry; and
- Significantly improve campus circulation and wayfinding.

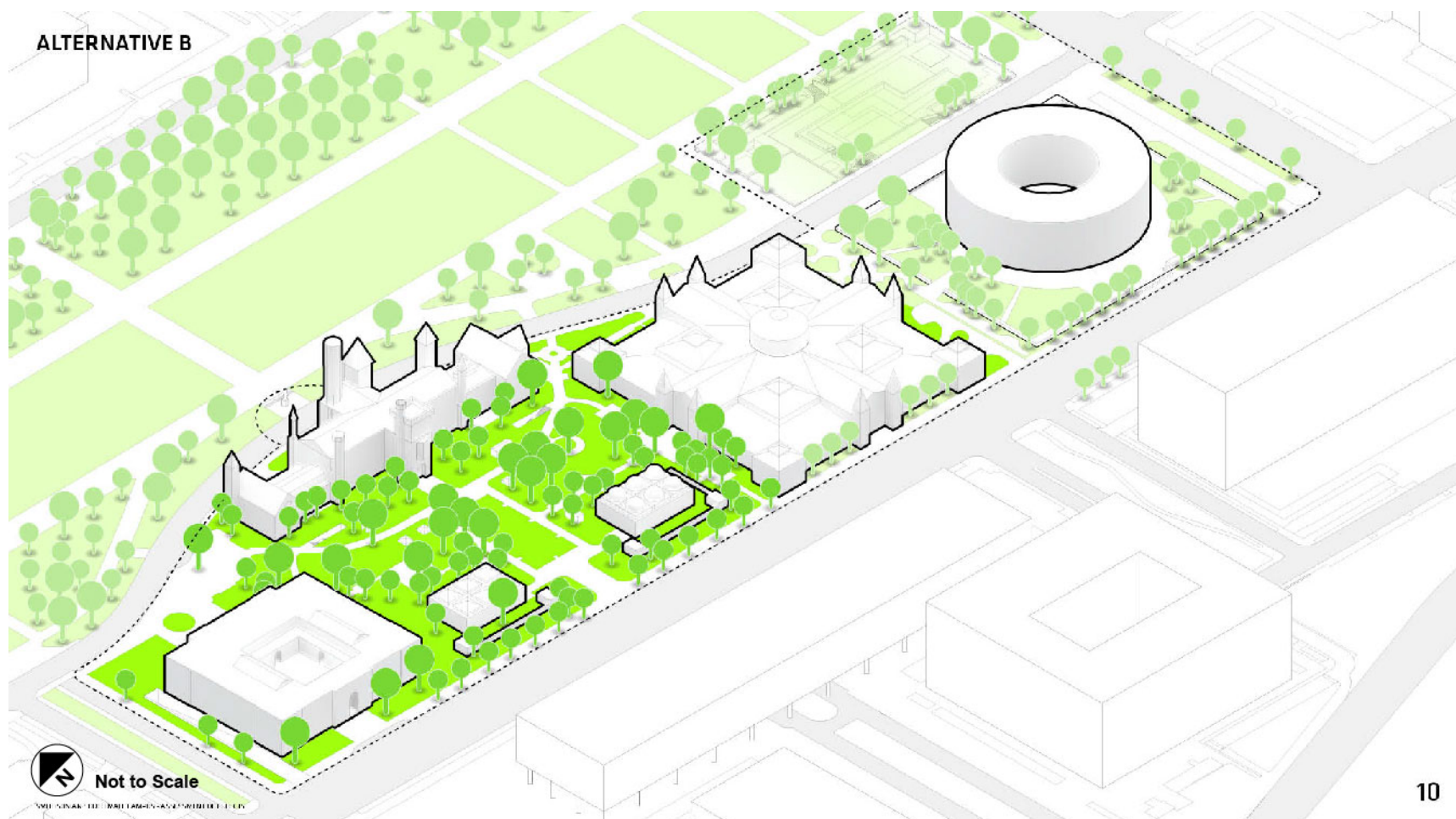
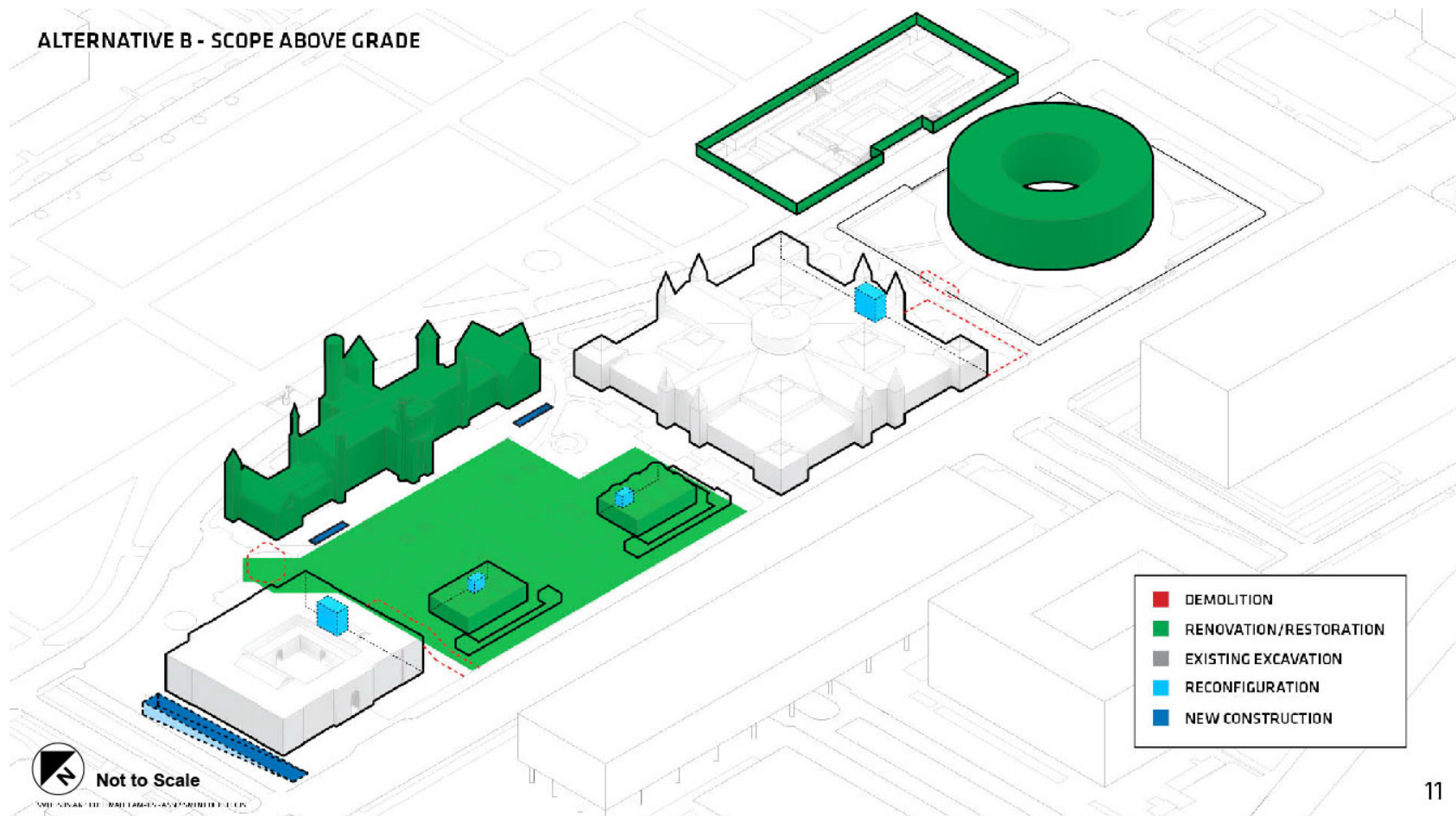


Figure 3-3. Alternative B.

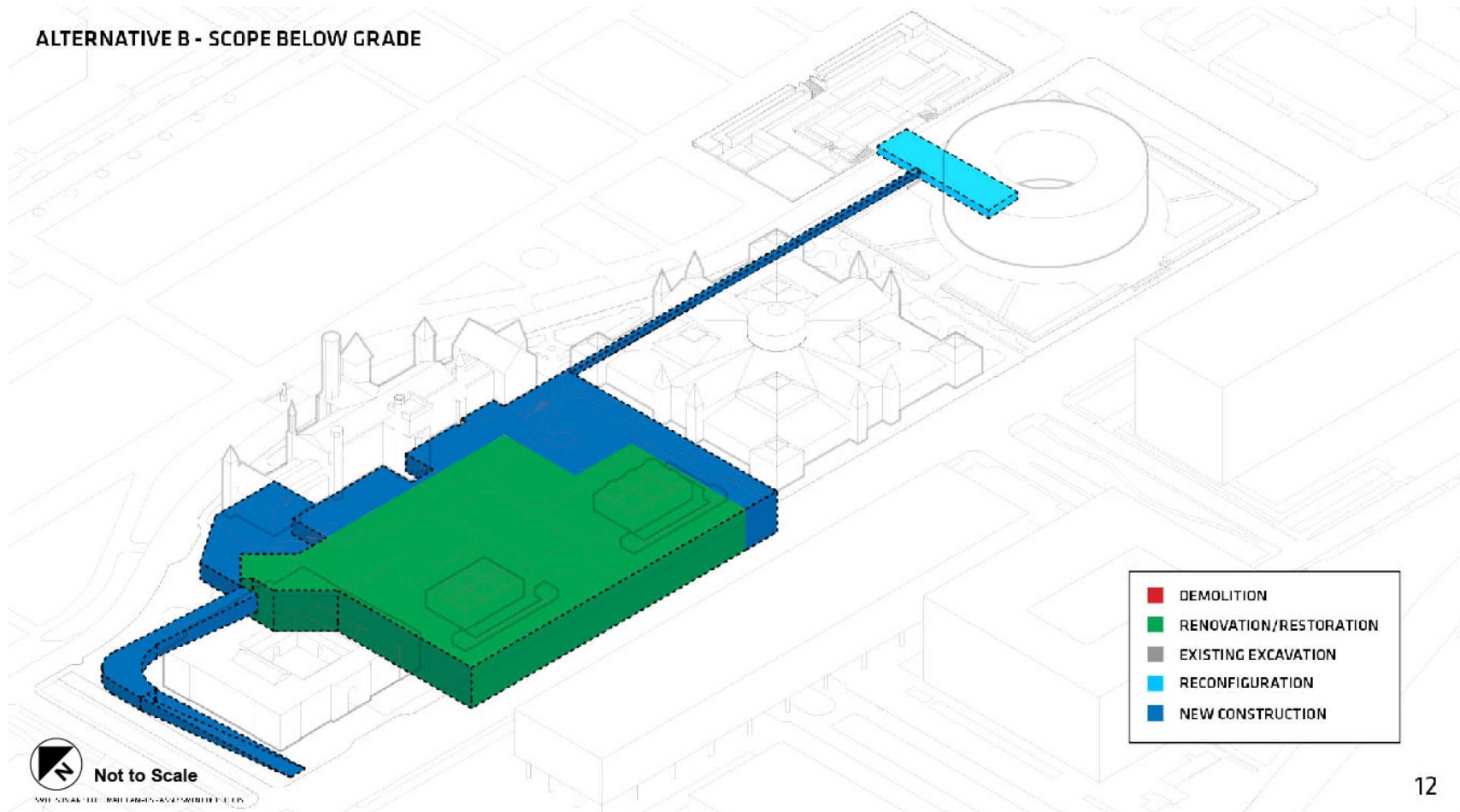
ALTERNATIVE B - SCOPE ABOVE GRADE



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Figure 3- 4. Actions Occurring Above Grade – Alternative B.

ALTERNATIVE B - SCOPE BELOW GRADE



12

Figure 3- 5. Actions Occurring Below Grade – Alternative B.

3.4.3 ALTERNATIVE D: PLANE CHANGES ABOVE AND BELOW GRADE

Under Alternative D there would be increased visibility and access entries from the National Mall, new museum pavilions, direct access from garden to amenities, cohesive Campus circulation, and connections between the Castle and Quadrangle Building. A new below grade visitor center extending from the Castle basement to the Quadrangle Building would be accessed via a sloped Haupt Garden that provides for an at grade garden entrance and windows to the garden. Visitor amenities including dining and museum shop would be located at the new Visitor Center so as to enable a less encumbered restoration of the historic above grade public spaces of the Castle and to double the number of visitors accommodated from 1 million to 2 million annually. The amount of space for Smithsonian Associates and other educational programs would similarly significantly increase and would be housed in the Visitor Center as well as at the north end of the reconfigured Quadrangle building. Importantly, the visitor center and education spaces would be adjacent and connected and would provide the Smithsonian with a location that includes a central large assembly space with adjacent smaller rooms for breakout sessions, a requirement for many conferences. This would significantly improve the Smithsonian's ability to host scientific meetings and similar gatherings as there are no comparable venues currently.

Alternative D reconfigures the Quadrangle Building to better meet the program needs of the Sackler Gallery and NMAfA and the Smithsonian education programs currently housed there. A key priority for the museums is the location of their entrances closer to the Castle Visitor Center and the National Mall, providing better visitor access as well as benefitting from the ability to share direct access to amenities including the new assembly and education spaces in the Visitor Center. The museums currently are adjacent but separated with little ability to share space and activities and circulate between them. Alternative D would provide greater connectivity between the museums, supporting the increasingly pan-Institutional emphasis in Smithsonian programming and

research. This alternative would provide the ability for each museum to expand both galleries and back of house spaces while maintaining required separations between public space and collections processing and storage space. The roof of the building would include a substantially reconfigured and expanded Haupt Garden with direct access to the Visitor Center amenities and education spaces and improved ability to host educational programs and events in the garden.

At the Hirshhorn Museum, Alternative D would provide substantial expansion of gallery space suited to large contemporary artworks through a redesign of the Sculpture Garden that would raise the level of portions of the garden with the new galleries located below. These new galleries would be connected back to the museum through an expanded tunnel beneath Jefferson Drive to reconfigured basement level public space. The Hirshhorn Museum has recently enjoyed a substantial increase in visitation and this expansion below grade would allow it to better serve its visitors and support its ambitious program of changing exhibitions and educational programs.

In addition to circulation enhancements, Campus infrastructure would be developed. At the Castle, seismic base isolation would be installed in conjunction with a central utility plant. To better segregate exhibit, event, and trash delivery / transfer an enlarged below grade central loading dock would be built. Related to the construction of a central loading facility, the Ripley pavilion would be demolished. Therefore, as shown in Figures 3-6, 3-7, and 3-8, in addition to the elements common to all Master Plan Alternatives, under Alternative D, SI would:

CASTLE

- Excavate a sub-basement area that extends beyond the footprint of the Castle to provide loading and utility support.

- Reconfigure Castle basement for use as a Visitor Center and improve connection to Quadrangle Building.

QUADRANGLE BUILDING AND HAUPT GARDEN

- Introduce new, exterior, below-grade dip entrance with universal ADA accessibility to the Visitor Center.
- Replace a portion of Quadrangle Building's roof to allow for a sloped landscape-grade entry to the Visitor Center.
- Expand Haupt Garden and reconfigure garden pathways on to the former footprints of the museum pavilions and loading dock.
- Remove Sackler Gallery and NMAfA museum pavilions and Install new museum entry pavilions closer to the National Mall.
- Remove existing Quadrangle Building roof bulkheads.
- Expand extent of existing skylights and install new skylights immediately south of the Castle.
- Reestablish historic view of the Washington Monument from south of the Castle.
- Improve historic view of Castle from Independence Avenue, SW.

HIRSHHORN MUSEUM AND SCULPTURE GARDEN

- Remove the Hirshhorn Plaza walls to the north, east and west to open the Museum to the National Mall.
- Expand the tunnel from the Hirshhorn Museum to the Sculpture Garden.
- Remove and reconfigure interior Sculpture Garden walls.
- Reconfigure Sculpture Garden to add new below-grade galleries. The Sculpture Garden would maintain a recessed relationship to the National Mall.

UTILITIES AND LOADING

- Construct a new central utility plant at sub-basement level beneath the Castle.

Alternative D, meets the benchmarks of the Master Plan (found on page 3-1); however, through the Section 106 process, concerns were raised about its potential adverse effects on historic resources because it does not:

- Retain the Quadrangle Building pavilions;
- Limit excavation beneath the Castle;
- Minimize changes to the grade in front of the Castle; and
- Preserve Haupt Garden features including intimate garden spaces, parterre, and the Renwick Gates

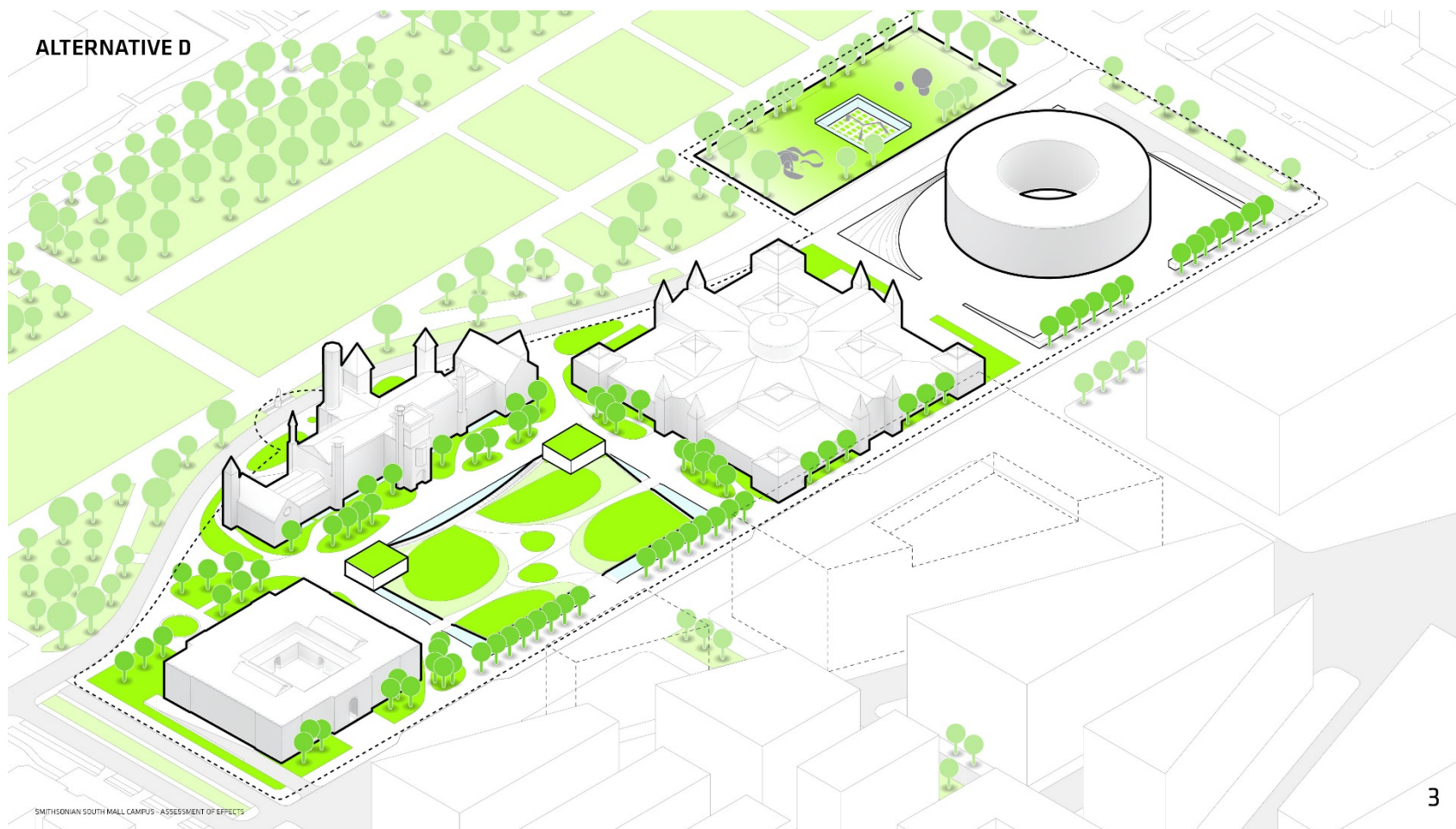


Figure 3- 6. Alternative D.

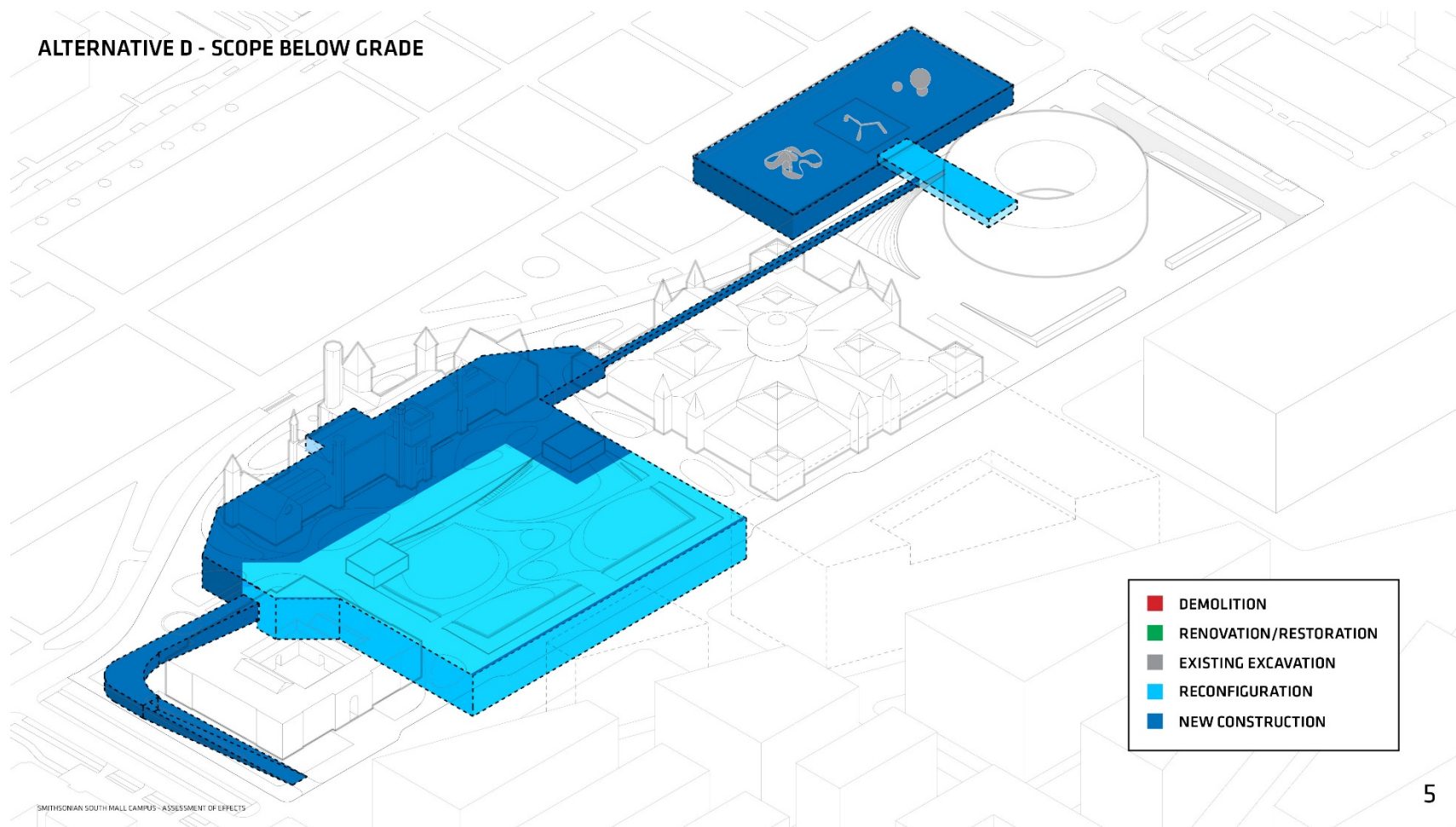
ALTERNATIVE D - SCOPE ABOVE GRADE

■ DEMOLITION
 ■ RENOVATION/RESTORATION
 ■ EXISTING EXCAVATION
 ■ RECONFIGURATION
 ■ NEW CONSTRUCTION

SMITHSONIAN SOUTH MALL CAMPUS - ASSESSMENT OF EFFECTS

4

Figure 3- 7. Actions Occurring Above Grade – Alternative D.



5

Figure 3- 8. Actions Occurring Below Grade – Alternative D.

3.4.4 ALTERNATIVE F: MAINTAIN FLAT PLANE OF CASTLE AXIS

Alternative F provides Increased visibility and access entries from the National Mall, new museum pavilions, direct access from garden to amenities, cohesive Campus circulation, and connections between the Castle and Quadrangle.

With Alternative F new below grade visitor center extending from the Castle basement to the Quadrangle Building would be accessed via the existing north and south entrances and stairs or elevators from the Great Hall as well as new public stairways from the Haupt Garden. Alternative F maintains the character of the Haupt Garden while remaining at grade. Gardens focus on creating both intimate and education spaces. New pavilions provide accessible entry to visitor center. Visitor amenities including dining and museum shop would be located at the new Visitor Center so as to enable a less encumbered restoration of the historic above grade public spaces of the Castle and to double the number of visitors accommodated from 1 million to 2 million annually. The amount of space for Smithsonian Associates and other educational programs would similarly significantly increase and would be housed in the Visitor Center as well as in a new assembly space at the north end of the reconfigured Quadrangle Building. Importantly, the visitor center and education spaces would be adjacent and connected and would provide the Smithsonian with a location that includes a central large assembly space with adjacent smaller rooms for breakout sessions, a requirement for many conferences. This would significantly improve the Smithsonian's ability to host scientific meetings and similar gatherings as there are no comparable venues currently.

Alternative F reconfigures the Quadrangle Building to better meet the program needs of the Sackler Gallery and the NMAfA and the Smithsonian education programs currently housed there. A key priority for the museums is the location of their above grade entrances closer to the Castle Visitor Center and the National Mall, providing better visitor access as well as benefitting from the

ability to share direct access to amenities including the new assembly and education spaces in the Visitor Center. The two new entrance pavilions would be smaller than the current three pavilions, increasing the area available for the Haupt Garden. The museums currently are adjacent but separated with little ability to share space and activities and circulate between them. Alternative F would provide greater connectivity between the museums, supporting the increasingly pan-Institutional emphasis in Smithsonian programming and research. This alternative would provide the ability for each museum to expand both galleries and back of house spaces while maintaining required separations between public space and collections processing and storage space. The roof of the building would include a reconfigured and expanded Haupt Garden with improved access to the Visitor Center amenities and education spaces and improved ability to host educational programs and events in the garden. Alternative F would retain many of the characteristics and specific features of the present Haupt Garden including a parterre on axis with the Castle, intimate gardens, gardens themed to adjacent museums and the Renwick Gates at Independence Avenue.

At the Hirshhorn Museum and Sculpture Garden, Alternative F would provide substantial expansion of gallery space suited to large contemporary artworks through a redesign of the Sculpture Garden that would raise the level of portions of the garden with the new galleries located below. These new galleries would be connected back to the museum through an expanded tunnel beneath Jefferson Drive to reconfigured basement level public space. The Hirshhorn Museum has recently enjoyed a substantial increase in visitation and this expansion below grade would allow it to better serve its visitors and support its ambitious program of changing exhibitions and educational programs.

In addition to circulation enhancements, Campus infrastructure would be developed. At the Castle, seismic base isolation would be installed in

conjunction with a central utility plant. To better segregate exhibit, event, and trash delivery / transfer an enlarged below grade central loading dock would be built. Related to the construction of a central loading facility, the Ripley Pavilion would be demolished. Therefore, in addition to the elements common to all Master Plan Alternatives, under Alternative F, as shown in Figures 3-9, 3-10, and 3-11, SI would:

CASTLE

- Excavate a limited sub-basement area beneath the west end of the building footprint to provide loading and utility support.
- Construct new below-grade Visitor Center in previously unoccupied area between Castle basement and Quadrangle Building and with a new entrance to the Visitor Center south of the Castle.

QUADRANGLE BUILDING AND HAUPT GARDEN

- Construct exterior entrance stairs to the Visitor Center at north edge of Quadrangle Building and Haupt Garden.
- Expand the Haupt Garden, while remaining at grade.
- Reconfigure garden pathways on to the former footprints of the museum pavilions and loading dock.
- Maintain intimate garden spaces, parterre, and Renwick Gates in the Haupt Garden.
- Remove Sackler Gallery and NMAfA museum pavilions and construct new entry pavilions closer to the National Mall.
- Expand extent of skylights around the Quadrangle Building and Castle.
- Reestablish historic view of the Washington Monument from south of the Castle.
- Improve historic view of Castle from Independence Avenue, SW.

HIRSHHORN MUSEUM AND SCULPTURE GARDEN

- Remove a small portion of west-facing Hirshhorn Plaza wall to create east-west circulation.
- Expand the tunnel from the Hirshhorn Plaza to the Sculpture Garden.
- Reconfigure the Sculpture Garden to add new below-grade galleries. The Sculpture Garden would maintain a recessed relationship to the National Mall.

UTILITIES AND LOADING

- Construct a new below-grade utility plant in an unexcavated area west of AIB.

Under Alternative F, all Master Plan benchmarks (found on page 3-1) would be met and all major concerns raised during the Section 106 process would be addressed because Alternative F would:

- Minimize excavation below the Castle by removing the central utility plant from underneath the Castle;
- Improve intimate Haupt Garden spaces, and retaining Garden features; and
- Reduce grade changes in front of the Castle.

However, the Quadrangle Building pavilions would not be retained.

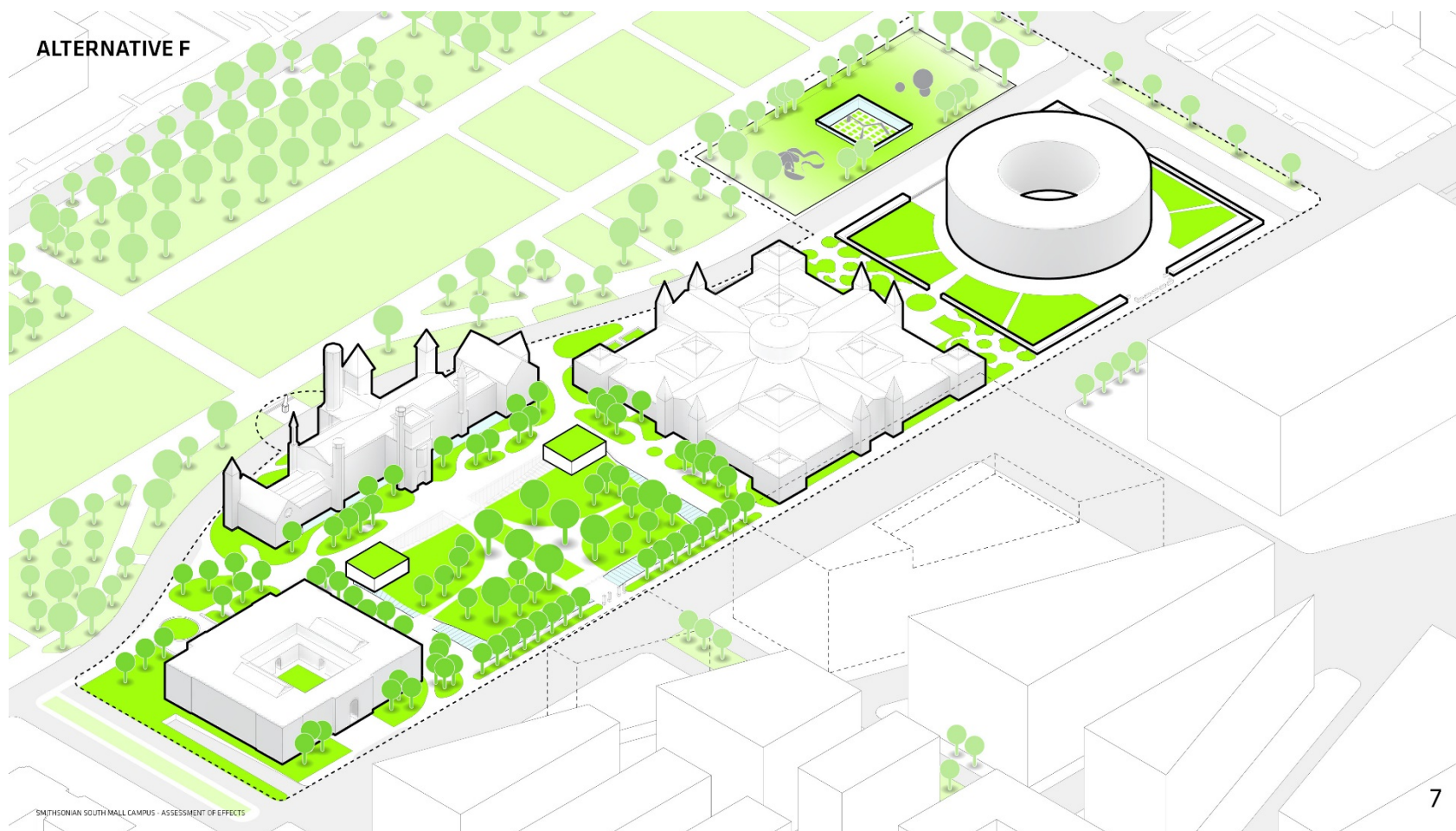
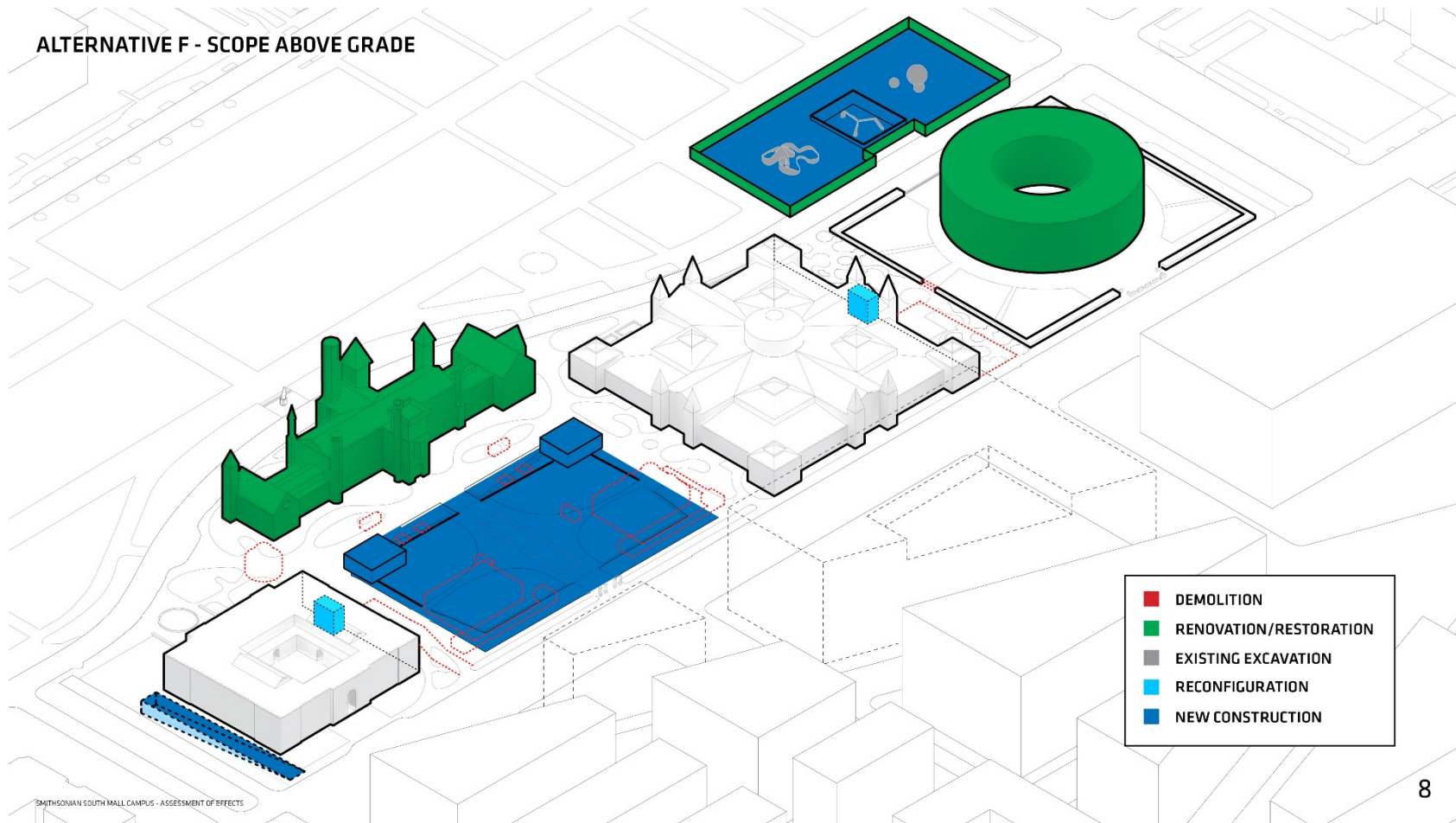


Figure 3- 9. Alternative F.

ALTERNATIVE F - SCOPE ABOVE GRADE



8

Figure 3- 10. Actions Occurring Above Grade – Alternative F.

ALTERNATIVE F - SCOPE BELOW GRADE

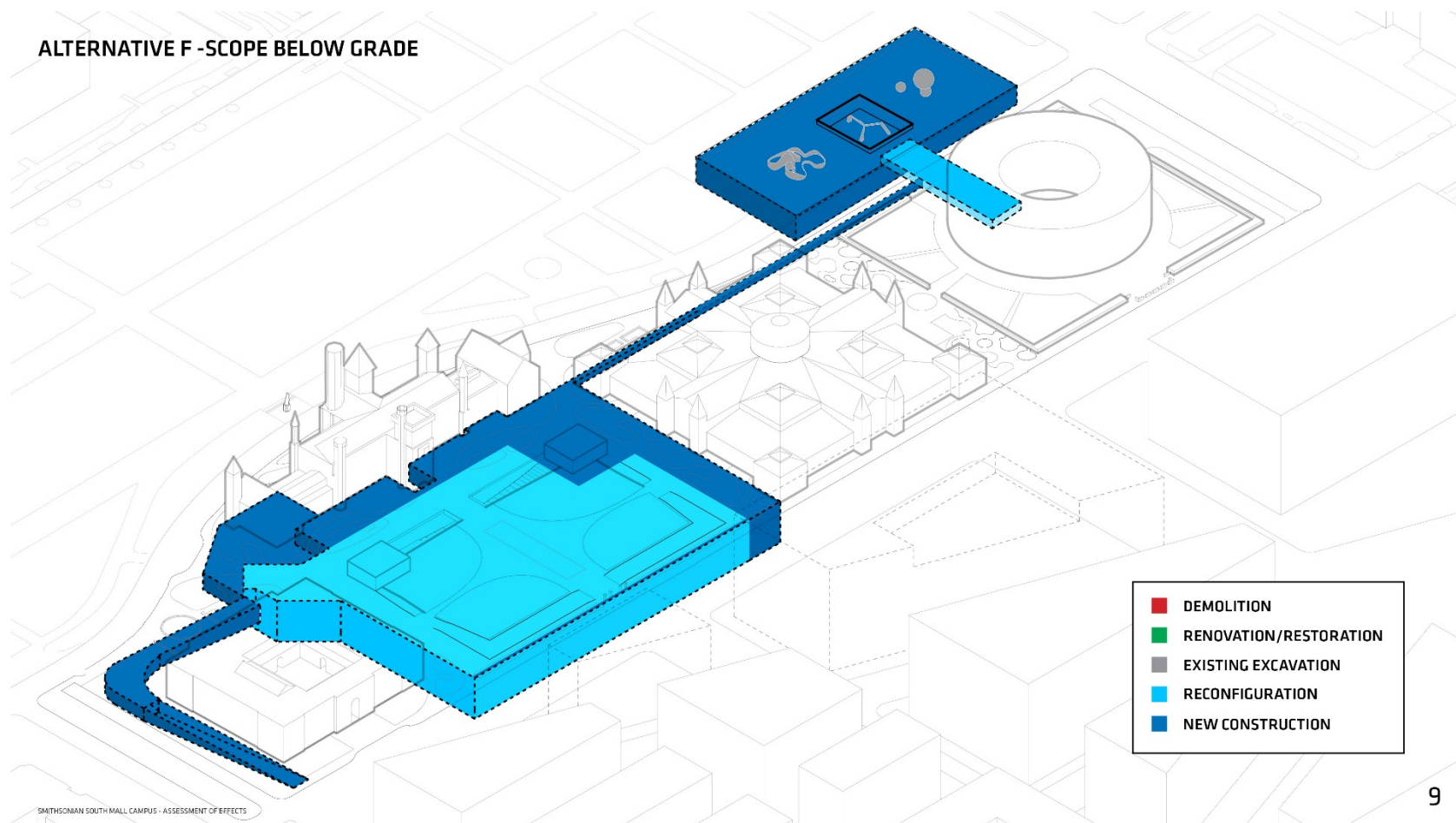


Figure 3- 11. Actions Occurring Below Grade – Alternative F.

3.5 WHAT OTHER ALTERNATIVES DID SI CONSIDER, BUT NOT EVALUATE IN THE EIS?

SI undertook extensive analysis of alternatives to meet the project's benchmarks. SI modified and eliminated alternatives based on whether or not they met the purpose and need for the South Mall Campus and the project's benchmarks listed on page 3-1. Alternatives eliminated from further consideration are described below.

3.5.1 ALTERNATIVE A: LIMITED BELOW GROUND CHANGE

Alternative A would minimize above and below grade changes while still accommodating improvements to the South Mall Campus' infrastructure. Throughout the ongoing maintenance of buildings and systems, the facilities would be kept operable. To protect the Castle from seismic events, base isolation would be used in conjunction with limited reinforcement. The Castle basement floor to ceiling height would be increased. Existing loading facilities would remain. The existing maintenance program for individual mechanical systems would continue. Mechanical systems would remain on GSA supplied steam and chilled water. The Quadrangle Building roof would be replaced under Alternative A.

Alternative A would have the least impact on the existing configuration of buildings; however, this alternative would not fully meet the purpose and need of the South Mall Campus Master Plan nor meet the benchmarks. Specifically, Alternative A would not:

- Replace outdated mechanical systems;
- Adequately serve visitor needs;
- Provide adequate loading;
- Provide new program space; and
- Improve campus circulation and wayfinding

Therefore, this alternative was dismissed from further analysis in this EIS as it failed to meet the greatest number of benchmarks set forth for the project. However, the adverse effects of this alternative were studied in the Assessment of Effects found in Appendix B because the Consulting Parties felt it had the least impact to cultural resources.

3.5.2 ALTERNATIVE C: MAINTAIN FLAT PLANE WITH CHANGES ABOVE AND BELOW GRADE

Alternative C would increase the visibility of access entries from the National Mall, construct new museum pavilions, create cohesive Campus circulation, and connect the Castle and Quadrangle Building. In addition to circulation enhancements, Campus infrastructure would also be developed. At the Castle, seismic base isolation would be installed. In conjunction with the seismic upgrade, a central utility plant would be built beneath the Castle basement. To better segregate exhibit, event, and trash delivery/transfer an enlarged below grade central loading dock would be built. Related to the construction of a central loading facility, the Ripley pavilion would be demolished. At the Hirshhorn, a new lower level Sculpture Garden gallery would be installed, as well as an expansion of the restored tunnel.

While Alternative C meets the purpose and need, it is similar to Alternative F. After reviewing with the Consulting Parties, it was agreed that Alternative C should be dismissed since its major components are shared with Alternatives D and F, and Alternative F more fully addresses the concerns raised through the Section 106 process. Therefore, it has been dismissed from further analysis in this EIS.

3.5.3 ALTERNATIVE E: MAINTAIN CHARACTER OF GARDENS AND MINIMIZE PLANE CHANGES

Alternative E was developed to address Consulting Parties comments about the preservation of the Haupt Garden's existing features and configuration. The Master Plan team looked at the following:

- A sloped entry to the Visitor Center as found in Alternative D.
- The Haupt Garden features would be transferred to a sloped grade to provide access to the Visitor Center.
- The extent of excavation for the central utility plant and combined loading facility under the Castle.

After consideration, Alternative E was dismissed from further analysis in this EIS because sloping the Haupt Garden into the entry for the Visitor Center did not preserve the character of the Haupt Garden and its features or the historic setting of the Castle.

3.6 WHAT ARE THE IMPACTS FROM EACH ALTERNATIVE?

Table 3-1 provides a concise summary of each alternative's program areas in square footages for comparison. Table 3-1 potential impacts by resource topic, including the No-Action Alternative. More detailed analysis for each alternative can be found in Chapter 4: Affected Environment and Environmental Consequences.

Table 3-1. Comparison of Program Areas

Project Component	No-Action Alternative		Alternative B		Alternative D		Alternative F	
	Above Grade	Above + Below Grade	Above Grade	Above + Below Grade	Above Grade	Above + Below Grade	Above Grade	Above + Below Grade
Building Program Area								
Castle (SIB)*	120,000	147,000	98,000	235,000	98,000	268,000	98,000	235,000
Quadrangle Building	12,000	340,000	12,000	340,000	3,000	332,000	2,000	355,000
Freer Gallery	84,000	130,000	84,000	130,000	84,000	130,000	84,000	130,000
AIB	179,000	186,000	TBD**	TBD**	TBD**	TBD**	TBD**	TBD**
Hirshhorn Museum and Sculpture Garden	104,000	177,000	103,000	182,000	103,000	288,000	103,000	288,000
SI Garden Areas								
Haupt Garden	76,000	n/a	79,000	n/a	81,000	n/a	90,000	n/a
Folger Rose Garden	4,000	n/a	4,000	n/a	3,000	n/a	4,000	n/a
Ripley Garden	13,000	n/a	13,000	n/a	15,000	n/a	21,000	n/a
Hirshhorn Museum Sculpture Garden	34,000	n/a	34,000	n/a	40,000	n/a	40,000	n/a

* Includes basement, visitor center, loading, central utility plant, and restored above-grade reductions in area as applicable

** Permanent use yet to be determined

Table 3-2. Comparison of Impacts

Resource Topic	No – Action Alternative	Elements Common to All Master Plan Alternatives	Alternative B	Alternative D	Alternative F
Topography & Soils	Minimal ground disturbance during routine repairs would result in direct and indirect short-term, negligible, adverse impacts.	Exposure and disturbance of soils during construction would result in direct and indirect short-term, minor, adverse impacts. Excavation would result in direct, short and long-term, minor, adverse impacts to previously disturbed soils and Campus' topography.	Exposure and disturbance of soils during construction would result in direct and indirect short-term, minor, adverse impacts. Excavation would result in direct, short and long-term, moderate, adverse impacts to previously disturbed soils and Campus' topography.	Exposure and disturbance of soils during construction would result in direct and indirect short-term, minor, adverse impacts. Excavation would result in direct, short and long-term, major, adverse impacts to previously disturbed soils and Campus' topography.	Exposure and disturbance of soils during construction would result in direct and indirect short-term, minor, adverse impacts. Excavation would result in direct, short and long-term, moderate, adverse impacts to previously disturbed soils and Campus' topography.
Seismic Vulnerability	Direct, long-term, major, adverse impacts from lack of seismic protection.	Direct, short-term, minor, adverse impacts during construction due to increased vulnerability. Seismic upgrades would result in a direct, long-term, major, beneficial impact.			
Stormwater Resources	There would continue to be a limited ability to retain and filter stormwater resulting in an indirect, long-term, minor adverse impact would occur.	Direct and indirect, short-term, minor, adverse impacts during construction. Direct and indirect, long-term, moderate, beneficial impacts from reduction of impervious surface and implementation of SWM.			
Air Quality	Construction activities during routine repairs would result in direct, short-term, minor, adverse impacts. Direct, long-term, minor, adverse impacts would occur from continued use of GSA steam and chilled water and existing mechanical systems.	Construction activities would result in direct, short-term, minor, adverse impacts. New mechanical systems and central utility plant would result in direct and indirect, long-term, minor, beneficial impacts. A minor increase in vehicular trips would result in an indirect, long-term, negligible, adverse impact.			

Resource Topic	No – Action Alternative	Elements Common to All Master Plan Alternatives	Alternative B	Alternative D	Alternative F
Greenhouse Gases, Climate Change & Energy Consumption	Direct and indirect, short and long-term negligible, minor, adverse impacts from continued use of GSA steam and chilled water and existing mechanical systems.	Construction activities would result in direct, short-term, minor, adverse impacts. New mechanical systems and central utility plant would result in direct and indirect, long-term, negligible, beneficial impacts			
Cultural Resources	Direct, long-term, moderate, adverse impacts from minor repairs and potential seismic and blast vulnerability. Minor repairs and renovations would negatively impact the character and setting of resources undergoing the repairs/renovations.	Construction activities would result in direct, short-term, moderate to major, adverse impacts. There would be long-term, minor, adverse impacts to the Freer Gallery from the alteration of the east wall. Blast protection, base isolation, and seismic bracing of the Castle would not result in adverse effects. Protecting the Castle from potential blast and/or seismic events would result in a long-term beneficial impact. Lowering the basement floor of the Castle and restoring the Castle would result in long-term, beneficial impacts. Removing the parking lot at AIB and restoring the east door to use would	Construction activities would result in direct, short-term, moderate to major, adverse impacts. The small opening that would be inserted on the west plaza wall of the Hirshhorn would create, long-term, minor adverse impacts. Reopening the tunnel would result in long-term, beneficial impacts. Minor, long-term, adverse impact would result from the reconfiguration of the Haupt Garden. Reorienting the Quadrangle Building Museum pavilions would not have an adverse impact on cultural resources. Impacts to cultural resources associated with	Construction activities would result in direct, short-term, moderate to major, adverse impacts. Sub-basement excavation of the entire Castle would create a long-term, moderate, adverse impact. Below-grade “dip” entrance to the Visitor Center would result in direct, long-term, major adverse impacts to the Castle. Reconfiguration of the Haupt Garden and removal and replacement of the Quadrangle Museum Pavilions would result in direct, long-term, major, adverse impacts by improving visibility Direct, long-term, major adverse impacts from the removal of plaza walls at the Hirshhorn.	Construction activities would result in direct, short-term, moderate to major, adverse impacts. The new Visitor Center entrance may result in long-term, moderate adverse impacts to the Castle. The small opening that would be inserted on the west plaza wall of the Hirshhorn would create, long-term, minor adverse impacts. Major, indirect, long-term impacts from the changes to the Hirshhorn Sculpture Garden and the reconfiguration of tunnel would result in moderate, long-term, adverse impacts. Reconfiguration of the Haupt Garden and removal and replacement of the

Resource Topic	No - Action Alternative	Elements Common to All Master Plan Alternatives	Alternative B	Alternative D	Alternative F
		<p>result in long-term, beneficial impacts.</p> <p>Renovating the Hirshhorn Building and Plaza and replacing the garden walls would result in long-term, beneficial impacts.</p> <p>Replacing the Quadrangle Building roof membrane would not adversely impact cultural resources.</p> <p>Perimeter security has the potential to have a long-term adverse adversely impact to the character of the National Mall.</p>	<p>the creation of a New Visitor Center, central utility plant, sub-basement excavation of the Castle, and excavation for a new loading ramp would be evaluated at the time of project design.</p> <p>There would be no indirect impacts.</p>	<p>Major, indirect, long-term impacts from the changes to the Hirshhorn Sculpture Garden and the reconfiguration of tunnel would result in moderate, long-term, adverse impacts.</p> <p>Removal of the pavilions would result in a long-term, major, adverse impact to the Quadrangle building.</p> <p>Removal and replacement of skylights would result in a long-term, moderate adverse impact.</p> <p>Impacts to cultural resources associated with the creation of a New Visitor Center, central utility plant, sub-basement excavation of the Castle, and excavation for a new loading ramp would be evaluated at the time of project design.</p> <p>There would be no indirect impacts.</p>	<p>Quadrangle Museum Pavilions would result in direct, long-term, major, adverse impacts by improving visibility.</p> <p>Removal of the pavilions would result in a long-term, major, adverse impact to the Quadrangle building.</p> <p>Removal and replacement of skylights would result in a long-term, moderate adverse impact.</p> <p>Impacts to cultural resources associated with the creation of a New Visitor Center, central utility plant, sub-basement excavation of the Castle, and excavation for a new loading ramp would be evaluated at the time of project design.</p> <p>There would be no indirect impacts.</p>

Resource Topic	No – Action Alternative	Elements Common to All Master Plan Alternatives	Alternative B	Alternative D	Alternative F
Visual Quality	<p>Direct, short-term, negligible, adverse impacts due to minor renovations.</p> <p>There would be no indirect impacts.</p>	<p>Direct, short-term, negligible, adverse impacts from construction activities.</p> <p>Direct, long-term, minor, adverse impact from new Visitor Center entrance.</p> <p>Removal of Ripley Pavilion and the addition of permanent security design would result in direct, long-term, minor, beneficial impacts because it would open views to the National Mall.</p> <p>Rehabilitation of the Castle would result in negligible, long-term, adverse impacts.</p> <p>There would be no indirect impacts.</p>	<p>Direct, short-term, negligible, adverse impacts from construction activities.</p> <p>Direct, long-term, minor adverse impacts from the creation of a small opening in the Hirshhorn Plaza and the restoration of the Hirshhorn tunnel.</p> <p>Reconfiguration of the Haupt Garden would result in direct, long-term, minor to moderate adverse impacts.</p> <p>There would be no indirect impacts.</p>	<p>Direct, short-term, negligible, adverse impacts from construction activities.</p> <p>Below-grade “dip” entrance to the Visitor Center would result in direct, long-term, major adverse impacts to the Castle.</p> <p>Reconfiguration of the Haupt Garden would result in direct, long-term, beneficial impacts by improving visibility and long-term, minor to moderate, adverse impacts by altering the secluded nature of the Garden and the addition of vents for the central utility plant.</p> <p>Direct, long-term, minor adverse impacts from the removal of plaza walls at the Hirshhorn and the raising of the Sculpture Garden would result in moderate, long-term, adverse impacts.</p> <p>Moderate, indirect, long-term impacts from the changes to the Hirshhorn Sculpture Garden.</p>	<p>Direct, short-term, negligible, adverse impacts from construction activities.</p> <p>Below-grade entrance to the Visitor Center would result in direct, long-term, moderate adverse impacts to the Castle.</p> <p>Reconfiguration of the Haupt Garden would result in direct, long-term, beneficial impacts by improving visibility and long-term, minor to moderate, adverse impacts by altering the secluded nature of the Garden and the addition of vents for the central utility plant.</p> <p>Direct, long-term, minor adverse impacts from the creation of a small opening in the Hirshhorn Plaza and the raising of the Sculpture Garden would result in minor to moderate, long-term, adverse impacts.</p> <p>Minor, indirect, long-term impacts from the changes to the Hirshhorn Sculpture Garden.</p>

Resource Topic	No – Action Alternative	Elements Common to All Master Plan Alternatives	Alternative B	Alternative D	Alternative F
Land Use Planning & Policies	There would be no impacts under the No-Action Alternative.	Direct and indirect, long and short-term moderate, beneficial impacts by complimenting other planning efforts.	Alternative B would have a minor to moderate, long-term, adverse impact in strengthening the connection of the South Mall Campus to the SW Ecodistrict as it would continue to block out of the neighborhood across Independence Avenue, SW from within the site and continue to block views into the gardens and to the Castle from outside.	A moderate, long-term, beneficial impact would occur by strengthening the connection of the South Mall Campus to the SW Ecodistrict and would increase views into the gardens and to the Castle from outside. It would be consistent with the SW Ecodistrict goals for a pedestrian-oriented development and improved connection to public space. Due to impacts to the historic character of the South Mall Campus, this alternative may not be fully consistent with the Urban Design or Historic Preservation Elements of the Comprehensive Plan. It would restore and renovate historic buildings consistent with the National Mall Plan's cultural resource goals.	A moderate, long-term, beneficial impact would occur by strengthening the connection of the South Mall Campus to the SW Ecodistrict as it would continue to block out of the neighborhood across Independence Avenue, SW from within the site and would increase views into the gardens and to the Castle from outside. Alternative F is consistent with the Comprehensive Plan and SW Ecodistrict Plan goals for pedestrian-oriented development and for improved connections to public space, and the most consistent with the Urban Design and Historic Preservation Elements of the Comprehensive Plan. It would restore and renovate historic buildings consistent with the National Mall Plan's cultural resource goals.

Resource Topic	No – Action Alternative	Elements Common to All Master Plan Alternatives	Alternative B	Alternative D	Alternative F
Traffic and Transportation	There would be long-term, negligible, adverse impacts from development in the area. The No-Action Alternative would not add any traffic.	Would not result in additional vehicular, bicycle, pedestrian, or transit trips.	Direct, long-term, negligible, adverse impacts from a minor increase in vehicular trips. Direct, long-term, negligible, adverse impacts from a minor increase in bicycle, pedestrian, and transit trips.		
Visitor Use & Experience	Direct, long-term, moderate, adverse impacts from lack of improvements to the South Mall Campus.	Direct and indirect, short-term, minor, adverse impacts from noise and access disruptions. Direct, long-term, minor, beneficial impacts from Campus improvements.	Direct and indirect, short-term, minor, adverse impacts from noise and access disruptions. Direct, long-term, minor, beneficial impacts from Campus improvements.	Direct and indirect, short-term, minor, adverse impacts from noise and access disruptions. Direct, long-term, moderate, beneficial impacts from Campus improvements.	Direct and indirect, short-term, minor, adverse impacts from noise and access disruptions. Direct, long-term, major, beneficial impacts from Campus improvements.
Human Health and Safety	Direct, long and short-term, minor, adverse impacts from the disturbance of hazardous materials and lack of security upgrades. Direct, long-term, minor, beneficial impact from removal of hazardous materials.	Direct, short-term, minor, adverse impacts from the disturbance of hazardous materials and safety hazards during construction. Direct, long-term, minor, and moderate, beneficial impact from removal of hazardous materials and installation of Campus seismic and blast protection. Direct, long-term, major, beneficial impacts would result from security upgrades including blast protection, perimeter security elements, and visitor screening upgrades.	Direct, short-term, minor, adverse impacts from the disturbance of hazardous materials and safety hazards during construction. Direct, long-term, minor, and moderate, beneficial impact from removal of hazardous materials and installation of Campus seismic and blast protection. Direct, long-term, moderate, beneficial impacts would result from security upgrades including blast protection, perimeter security elements, and visitor screening upgrades. However, this alternative does provide adequate	Direct, short-term, minor, adverse impacts from the disturbance of hazardous materials and safety hazards during construction. Direct, long-term, minor, and moderate, beneficial impact from removal of hazardous materials and installation of Campus seismic and blast protection. Direct, long-term, major, beneficial impacts would result from security upgrades including blast protection, perimeter security elements, and visitor screening upgrades.	

Resource Topic	No – Action Alternative	Elements Common to All Master Plan Alternatives	Alternative B	Alternative D	Alternative F
			daylight for staff that would result in minor, long-term, adverse impacts.		
Utilities	Continual need to repair utilities would result in direct, long-term, minor, adverse impacts. Remaining on GSA steam and chilled water would result in indirect, long-term, moderate, adverse impacts to SI collections.	Direct, short-term, negligible, adverse impacts from temporary increase in utility demand. Direct and indirect, long-term, moderate, beneficial impact from overall reduction in utility use. Indirect, short-term, minor, adverse impacts from disruption to utilities.			
Waste Management	No impacts.	Direct, short-term, minor, adverse impacts from increased waste generation during construction. Direct, long-term, moderate, beneficial impacts from streamlined waste management. Indirect, short and long-term, negligible, adverse impacts from waste generated on the South Mall Campus.			

3.7 WHAT MITIGATION MEASURES WOULD BE IMPLEMENTED UNDER EACH ALTERNATIVE?

TOPOGRAPHY AND SOILS

By implementing an erosion and sediment control plan as described under elements common to All Master Plan Alternatives, the South Mall Campus Master Plan would be in compliance with DOEE regulations. Stormwater impacts would be temporary and would be minimized as much as possible by implementing BMPs during construction, including but not limited to silt fence, erosion matting, curb inlet protection, hay bales, and revegetation of exposed sediment. Soils to be used as fill would be tested for hazardous materials and structural stability before use. Excavation and soil disturbance could increase the risk of

uneven foundation settlement during construction. To reduce these risks, a preconstruction survey would be conducted prior to any underground excavation. Monitoring systems would be established in the interior and exterior of affected buildings to protect against vibration and settlement related damage during construction (RSA, 2015a). If soils are to be impacted on NPS land, SI would get permits needed from NPS for use of NPS land. No additional mitigation is required.

SEISMIC VULNERABILITY

The Castle and the AIB are NHLs that warrant the best and most comprehensive approach to protecting the resources. To this end, preconstruction surveys would be conducted for future projects of the Master Plan prior to any underground excavation to identify seismic deficiencies. Underpinning would be installed in accordance with all applicable codes and standards. Monitoring systems would be established in the interior and exterior of each building to protect against vibration and settlement related damage during construction (RSA, 2015a). If an earthquake were to occur during construction, the temporary methods used to underpin or stabilize the foundations of the Castle and other Campus buildings may temporarily increase their seismic vulnerability.

STORMWATER MANAGEMENT

By implementing an erosion and sediment control plan and SWMP, reducing impervious surface, installing the stormwater capture and reuse system, and providing green infrastructure as described under elements common to all Master Plan Alternatives, the Master Plan would be in compliance with the District's 2013 Stormwater Rule. One or more cisterns would be provided either near the central utility plant or in the sub-basement of the Castle to capture and store stormwater drainage from the Castle and AIB roofs. Oil-water separators would be installed in the central loading facility and ramp to ensure that no

contaminated water enters the cisterns or drains offsite. No additional mitigation is required.

AIR QUALITY

During construction, demolition, excavation, or renovations, short-term impacts would be mitigated through the use of proper control measures including minimizing vehicle idling times; maintaining emission controls on construction vehicles and equipment; and covering/wetting exposed soils to reduce fugitive dust. In order to reduce long-term adverse impacts to air quality, SI would replace outdated mechanical systems that are at the end of their useful lives. A new central utility plant would be constructed with modern, efficient units which would result in a long-term reduction in air emissions.

In order to reduce impacts from additional vehicular trips generated by the implementation of the Master Plan, adjustments to signal timing and phasing would be made to minimize idling times and therefore minimize impacts to air quality. These mitigation measures are discussed in further detail below in the Traffic and Transportation Section.

CULTURAL RESOURCES

In order to reduce adverse impacts on cultural resources, SI would continue to consult with NCPC, NPS, DC SHPO, and the Consulting Parties through the Section 106 consultation process to minimize or avoid adverse impacts. A Programmatic Agreement would be prepared that would outline a process for identifying, avoiding, and minimizing adverse impacts on cultural resources for those components of the Master Plan that cannot be fully evaluated at this time.

A **Programmatic Agreement** is a Section 106 resolution document used for complex projects or those that address multiple undertakings. Programmatic Agreements are on occasions when the federal agency cannot fully determine how an undertaking may affect historic properties prior to its approval during Section 106 process.

The Programmatic Agreement is a legally binding document that outlines the manner in which the federal agency will carry out the undertaking and address future potential adverse effects of the project.

VISUAL QUALITY

Impacts to visual resources resulting from the Master Plan Alternatives would be minimized through sensitive, context-aware designs that reference, and are compatible, with existing features. Any above-grade structures and landscape features proposed for the South Mall Campus would be limited in their size and placement in order to preserve and enhance existing views and historic viewsheds. For any changes where replanting of existing vegetation is necessary, such as in the Haupt Garden, Smithsonian would endeavor to specify mature replacements to shorten or minimize the temporary effects of construction. Where possible, infrastructure elements—such as the new loading dock ramp, perimeter security features, and central utility plant ventilation—would be integrated into landscape features to create a cohesive, aesthetically compatible design. Further measures to minimize impacts to visual quality would be identified at the time individual projects are brought forward for design.

LAND USE PLANNING AND POLICIES

The Master Plan Alternatives were developed with extensive input from NCPC, DC SHPO, CFA, DCOP, DDOT, USDA, GSA, and NPS, among others, to ensure that the alternatives are consistent with federal and local planning ordinances. The South Mall Campus Master Plan would be subject to review and approval by NCPC.

TRAFFIC AND TRANSPORTATION

Given the built-out nature of the transportation network within the area, emphasis was placed on improving the overall intersection operations through adjustments to signal timing and phasing. No new capacity (i.e. additional lanes) are proposed. To address the capacity deficiencies identified utilizing DDOT criteria, the following mitigation measures are recommended:

- Signal timing, phasing, and offset modifications, including an increase in cycle lengths from 110 seconds to 150 seconds in the PM peak hour. This provides an improved balance in delay between movements and would likely need to be conducted as a part of a wider signal retiming effort, required in the future to accommodate background growth and other projects by 2040.
- Modify the existing unsignalized intersection of SW Jefferson Drive, SW and 12th Street, SW from a two-way stop controlled intersection to an all-way stop controlled intersection. Modifying the SW Jefferson Drive, SW eastbound shared thru-right movement from a free movement to a stop-controlled movement would grant more acceptable gaps for pedestrians to cross Jefferson Drive, SW, along with reducing delay for right turning vehicles on 12th Street, SW. This would be subject to NPS approval. SI would get NPS approval on any permits needed for use of NPS land.
- Modify the southbound 14th Street, SW approach to Jefferson Drive, SW to include a protected-permitted left-turn phase.

In addition to vehicular mitigation measures, SI would continue to work with DDOT on the approval of the curb cut for the proposed new loading dock. The following mitigation measures are recommended for bicycles, pedestrians, and loading:

- Monitor utilization of onsite bicycle parking, as well as Capital Bikeshare stations within ¼ mile. If demand exceeds capacity install new bike racks and/or a Capital Bikeshare Station. If a new Capital Bikeshare Station is required, consider locating it near the intersection of 7th Street, SW and Jefferson Drive, SW to fill an existing gap in the system.
- Upgrade all curb ramps connecting to/from the South Mall Campus to meet current ADA standards.
- Provide a new crosswalk across the westbound approach of Independence Avenue, SW at the intersection with 12th Street, SW.

- Monitor passenger loading areas to determine if they continue to meet SI needs without impacting traffic operations on Jefferson Drive, SW or Independence Avenue, SW.
- Schedule all deliveries made with trucks WB-50 or larger in advance. These deliveries would be scheduled to avoid the AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods, unless necessary. This would likely have a minimal impact on the South Mall Campus facilities, as the majority of deliveries with larger trucks currently occur during off-peak periods.
- Deliveries made in vehicles larger than a single unit truck should enter from northbound 12th Street, SW or eastbound Independence Avenue, SW to avoid wide right-turns into the proposed driveway.
- Right-turns on red should be restricted at the proposed driveway and the westbound Independence Avenue, SW approach at the signalized intersection with 12th Street, SW.

VISITOR USE AND EXPERIENCE

In addition to phasing the implementation of the Master Plan, the SI would provide appropriate signage and fencing would be used to keep passersby out of construction areas. Visitors to the South Mall Campus would be notified via SI's websites to alert visitors to the potential for closed exhibits and/or constructions areas. In concert with using the SI's website, the SI would provide potential notifications via signage, postings on social media webpages, email blasts, and press releases. In addition, construction activities would be coordinated with SI in a manner that would minimize disruptions during planned events. Pathways through the South Mall Campus would be rerouted during construction to maintain bike and pedestrian flow.

UTILITIES

SI would implement campus-wide energy efficiency and sustainability measures, such as energy-efficient lighting, improved building envelopes, modernized HVAC systems, skylights and natural ventilation, low-flow plumbing fixtures, and renewable energy systems. Stormwater throughout the South Mall Campus would be collected and stored, to the maximum extent practicable, in the central utility plant and would be reused for irrigation, reducing stormwater runoff and demand for potable water. By adopting the energy efficiency measures described above, the South Mall Campus would reduce its energy usage by over 30 percent, reduce its carbon emission by 40 percent, and reduce its overall energy costs by over 50 percent per year. If any utilities that are to be impacted are on NPS-owned land, SI would get any permits needed from NPS for use of NPS land.

WASTE MANAGEMENT

In addition to SI's existing recycling program, SI would also implement expanded composting, recycling, reuse, and return-to-vendor programs to reduce the amount of waste generated on the South Mall Campus. The proposed food and beverage systems on the South Mall Campus would use reusable, recyclable, or compostable dishes, cups, silverware, napkins, and other food service items. Recyclable and compostable materials would be separated from the landfill-bound waste stream to the maximum extent practicable. These waste diversion and reduction methods would further SI's goal for 80 percent of institutional waste to be diverted from landfills by 2020.



CHAPTER 4

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES



CHAPTER 4

Impacts include:

Direct impacts, which are caused by the action and occur at the same time and place.

Indirect impacts are caused by the action and occur later in time or further removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

(40 CFR 1508.7 and 1508.8)

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1 WHAT IS THE AFFECTED ENVIRONMENT AND HOW ARE IMPACTS EVALUATED?

This chapter of the EIS describes the existing conditions at the South Mall Campus and the effects the proposed Master Plan would have on the South Mall Campus and the surrounding area. The alternatives described in Chapter 3 have varying impacts to natural resources, the social and economic environment, historic resources, and infrastructure (transportation network and utilities).

Impacts can occur from the implementation of any portion of the Master Plan. Impacts can also occur both directly at the South Mall Campus as well as off-site (for example, an increase in the number of visitors to the South Mall Campus could affect existing traffic on roads in the surrounding area). Cumulative impacts from the proposed South Mall Campus Master Plan, when added to other past, present, and future projects are discussed at the end of this chapter.

Potential impacts are described in terms of:

- *Intensity* - negligible, minor, moderate, or major effects;
- *Type* - beneficial or adverse effects;
- *Duration* - short-term effects, lasting through construction or less than one year, or long-term effects, lasting more than one year; and
- *Context* - site-specific, local, or even regional effects.

The thresholds for the intensity of impacts are defined as follows:

- *Negligible*, effects are localized and not measurable at the lowest level of detection;
- *Minor*, effects are localized and slight, but detectable;
- *Moderate*, effects are readily apparent and appreciable; or
- *Major*, effects are severely adverse, significant, and highly noticeable.

Existing conditions data was collected and potential environmental impacts were assessed using best available scientific studies, guidance documents, and information. Information used to analyze the impacts were obtained from federal, state, and local resources. These include, but are not limited to, the following:

- Environmental Protection Agency (EPA) analyses and reports
- US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Surveys
- Federal Emergency Management Agency (FEMA) Floodplain Maps
- US Army Corps of Engineers (USACE) wetland manuals
- US Fish and Wildlife Service (USFWS) threatened and endangered species lists
- Federal Highway Administration (FHWA) traffic guidance

A complete list of references is included at the end of this EIS.

4.2 WHAT RESOURCE ISSUES HAVE BEEN ELIMINATED FROM FURTHER ANALYSIS?

The impact topics below would not be effected or would be negligibly effected by each of the Master Plan Alternatives evaluated in this EIS. In general, negligible effects are effects that are localized and immeasurable. Topics that

have either no or negligible impacts are briefly discussed in this section and then dismissed from further consideration or evaluation.

4.2.1 GEOLOGY

The South Mall Campus is within the Atlantic Coastal Plain physiographic province (USGS, 1994), which is characterized by alternating layers of silt, sand, and clay underlain by metamorphic and igneous rock (DC WRRRC, 1995). Specifically, the South Mall Campus is within the Quaternary (Pleistocene) geologic map unit, consisting of sand, gravel, and/or peat intercut with silt and clay beds containing scattered pebbles and wood fragments. The depth to bedrock at the South Mall Campus is between 120 to 140 feet below the surface (GSA/NCPC/Edaw Inc, 1980).

Implementation of the South Mall Campus Master Plan would not alter the geology of the project area. Therefore, this impact topic was not studied in detail in this EIS.

4.2.2 WILDLIFE AND VEGETATION

The South Mall Campus consists of five principal buildings and four designed gardens, in addition to subsidiary structures, circulation features, and infrastructure. The gardens include a mixture of native and exotic plants. Other landscaped areas within the South Mall Campus consist of turfgrass and ornamental trees, shrubs, hedges, and vines. No natural vegetation exists onsite. Any vegetation that would be removed with implementation of the Master Plan Alternatives would be replaced with similar vegetation, resulting in a negligible, short-term, direct, adverse impact to vegetation. No long-term impacts are anticipated because vegetation removed during construction would be reestablished. Impacts to vegetation as it relates to historic landscapes are discussed in further detail in Section 4.10 Visual Quality. Therefore, vegetation has been dismissed from further analysis.

None of the landscaped areas located within the South Mall Campus have been specifically designed to attract native birds or wildlife, but they may support birds such as sparrows, pigeons, crows, robins, and other bird species common to urban environments. Due to the South Mall Campus' location in a heavily trafficked urban area, wildlife species in the project area are limited to those highly adapted to urban environments, such as gray squirrels, chipmunks, rats, bats, and possibly raccoons. Wildlife and birds may be temporarily displaced during construction activities due to noise. The removal of any trees would be done outside the nesting season. These species would be expected to return following construction, resulting in a negligible, short-term, indirect, adverse impact to wildlife. No long-term impacts would occur. Therefore, wildlife has been dismissed from further analysis.

4.2.3 THREATENED AND ENDANGERED SPECIES

The Endangered Species Act (ESA) of 1973 protects and recovers imperiled species and the ecosystems upon which they depend. Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. Under Section 7 of the ESA, federal agencies are required to consult with USFWS to ensure that their actions do not adversely affect listed species.

On behalf of NCPC and SI, Stantec Consulting Services Inc. consulted the USFWS Information for Planning and Conservation (IPaC) system and the District Department of Energy and Environment (DOEE) in compliance with Section 7 of the ESA. In an Official Species List generated on January 31, 2017, USFWS confirmed that no federally-listed endangered or threatened species or critical habitats are present near the South Mall Campus, and no additional coordination under Section 7 of the ESA is required. The Fish and Wildlife Division of the DOEE was contacted on February 13, 2017. In a letter dated

February 14, 2017, DOEE indicated that the South Mall Campus does not harbor any listed species. All consultation items related to threatened and endangered species can be found in Appendix A. As no listed species or critical habitat are present within the South Mall Campus, threatened and endangered species have been dismissed from further analysis.

4.2.4 GROUNDWATER AND HYDROLOGY

Historically, groundwater at the South Mall Campus and throughout the National Mall area generally flows west and southwest toward the Potomac River (NPS, 2010a). The depth of groundwater at the South Mall Campus ranges from 23 to 40 feet below the ground surface, with an average depth of 33 feet (Haley and Aldrich, 2014). Groundwater is not used as a potable water supply in the District.

Currently, the South Mall Campus consists of approximately 56 percent impervious surface, including buildings, parking areas, roads, sidewalks, and contained water features. The pervious surfaces within the Haupt Garden are underlain by the underground portions of the Quadrangle Building. Due to the location of the underground Quadrangle Building, the connection to the water table in the Haupt Garden has been interrupted, and the potential for groundwater infiltration and recharge is minimal. The Master Plan Alternatives would not alter the recharge of groundwater or affect the water table. Therefore, groundwater and hydrology have been dismissed from detailed analysis in this EIS.

4.2.5 SURFACE WATER AND WETLANDS

The US EPA and the USACE are responsible for enforcing certain provisions of the Clean Water Act (CWA) (33 U.S.C. §1251 et seq.) which was enacted by Congress "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" including wetlands and Waters of the US. One of the mechanisms adopted by Congress to achieve that purpose is a prohibition

on the discharge of any pollutants, including dredged or fill material, into wetlands or Waters of the US except in compliance with a permit issued pursuant to CWA §402 or §404.

The ACOE defines wetlands as “areas saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for line in saturated soil conditions” (33 CFR 328.3). Wetlands generally include swamps, marshes, bogs, and similar areas. The technical approach for the identification and delineation of wetlands is that, except in certain abnormal situations, evidence of a minimum of one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a wetland determination.

The South Mall Campus is within the Middle Potomac-Anacostia-Occoquan watershed (HUC 02070010). A review of National Hydrography Dataset (NHD) mapping, USFWS National Wetland Inventory (NWI) mapping (USFWS, 2017c), topographic mapping (USGS, 2014), soils data (NRCS, 2017), and the DOEE map of Known Wetlands within the District (DDOE, 2001) indicated that no Waters of the US, including wetlands, are present onsite. Therefore, surface waters and wetlands have been dismissed from further analysis.

4.2.6 FLOODPLAINS

Federal activities that take place within floodplains must be in compliance with Executive Order (EO) 11988: Floodplain Management, 33 2 C.F.R. 1977. Per this executive order, federal agencies are required to avoid adverse effects associated with the occupancy and modification of floodplains to the extent possible, thereby minimizing flood risk and risks to human safety (FEMA, 2017). They must also be in compliance with NCPC’s Submission Guidelines for Master Plans.

The South Mall Campus is located on FEMA Flood Insurance Rate Map (FIRM) Number 1100010019C, effective September 27, 2010 (Figure 4-1). The Potomac Park flood control levee, located just south of the intersection of 17th Street, SW and Constitution Avenue, NW, was altered in 2014 to provide a more reliable removable flood control system that meets FEMA's standards. As a result, FEMA has issued a Letter of Map Revision (LOMR), effective September 14, 2016 (Appendix A), that includes the South Mall Campus.

As shown on both the FIRM and LOMR, the majority of the South Mall Campus is outside of the 100-year and 500-year floodplain. The Hirshhorn Sculpture Garden is within the 500-year floodplain, which has a 0.2 percent chance of flooding annually. The Sculpture Garden is not considered a critical facility and therefore is not required to be located outside of the 500-year floodplain. Existing and future sculptures within the Sculpture Garden are not likely to increase flood levels, impede flood flow, or adversely impact floodplain function.

Under the Master Plan Alternatives, the design of the new loading dock would incorporate a flood gate at the top of the ramp to protect the loading dock from flooding, even though it is out of the 100- and 500-year floodplain. The surface elevation of the Sculpture Garden would change slightly to accommodate below-grade amenities and galleries. Additionally, the underground connection between the Sculpture Garden and the Hirshhorn Plaza would be restored. The proposed underground connection would be designed to protect any SI collections that might be placed in the tunnel. Although these actions would occur within the floodplain, they are not expected to have a measurable impact on the frequency, elevation, intensity, or duration of floods, nor would they impact floodplain function. Therefore, floodplains was dismissed from further analysis within this EIS.



4.2.7 COASTAL ZONE

The Federal Coastal Zone Management Act of 1972 (CZMA) encourages States to “preserve, protect, develop, and where possible, restore or enhance the resources of the nation’s coastal zone” (16 U.S.C. § 1456). All federal development projects inside the coastal zone must comply with Section 307 of the CZMA. The National Coastal Zone Management Program, administered by the National Oceanic and Atmospheric Administration (NOAA), ensures that federal actions in the designated coastal zone of a state or territory are consistent with the enforceable policies of that state’s approved coastal management program.

The District of Columbia has no designated Coastal Zone nor does it have a Coastal Zone Management Plan. Therefore, the CZMA does not apply, and coastal zone management has been dismissed from further analysis in this EIS.

4.2.8 ARCHAEOLOGICAL RESOURCES

Historic grading, filling, and construction activities for the surrounding museum buildings likely disturbed any intact archaeological resources in this area. There are a few locations on the South Mall Campus that have not been significantly disturbed. While there is the potential for archaeological resources to be present in these areas, the potential for resources has been determined to be low. The area of the South Mall Campus has been heavily disturbed since the mid-1800s greatly reducing potential for intact archaeological resources. Should any archaeological resources be discovered during ground-disturbing activities associated with any of the proposed actions, SI would consult with the DC SHPO to ensure the discovery is assessed and treated appropriately. A Programmatic Agreement is currently being developed and would include the process SI would follow for dealing with unanticipated discoveries as each project in the Master Plan is implemented. Due to the low potential of archaeological resources in the area of the South Mall Campus, the topic is not studied in detail in this EIS.

4.2.9 NOISE

The EPA defines noise pollution as “unwanted or disturbing sound” and noise pollution is regulated under the Noise Control Act of 1972 (EPA, 2017a). Noise is measured in decibels on the “A” weighted scale (dBa) which represents the range of sounds that can be heard by the human ear. The EPA has declared sound in excess of 55 dBA to be “normally unacceptable” for sensitive populations such as schools and residences. The South Mall Campus is located in an urban area of Washington, DC surrounded by commercial buildings, other museums and monuments, and the National Mall. Noise sources in the vicinity of the South Mall Campus is common to those found in urban areas including traffic, emergency sirens, playing children and human conversations. The typical noise level for urban areas is approximately 70 dbA and can temporarily reach up to 120 dbA due to sirens and other loud vehicles (EPA, 1971).

The entire National Mall including the South Mall Campus is considered a sensitive noise receptor. Relatively low noise levels are appreciated within the buildings of the South Mall Campus and in the various gardens as tourists admire exhibits and the beauty of the grounds. Implementation of the South Mall Campus Master Plan would not add any new, permanent noise sources and therefore noise has been dismissed from further analysis in this EIS.

Temporary increases in noise during construction would impact visitor enjoyment of the South Mall Campus and surrounding area including the National Mall. These impacts are discussed under the Visitor Use and Experience section of this EIS.

4.2.10 COMMUNITY FACILITIES AND SERVICES

A wide variety of parks, open space, recreation, and community facilities are present in the area surrounding the South Mall Campus. The National Mall contains approximately 684 acres of public land. The South Mall Campus itself is a community resource that provides open space and encourages public

engagement with the arts. The South Mall Campus is located on the National Mall and is surrounded by many other parks, museums, memorials, monuments, gardens, recreational areas, and general open space. Additionally, there are many libraries located near the South Mall Campus and in many of the museums on the National Mall.

The South Mall Campus is generally surrounded by federally-owned land, and therefore there are no schools, universities, healthcare facilities, or religious facilities in proximity to the South Mall Campus. Although implementation of the South Mall Campus Master Plan may increase the number of visitors to the South Mall Campus, community facilities and services would be able to handle the additional patronage and would not be adversely affected. Therefore, this topic was not studied in detail in this EIS.

4.2.11 POPULATION AND HOUSING

The South Mall Campus is surrounded to the north, east, and west by the National Mall and related buildings. The Smithsonian National Air and Space Museum is adjacent to the Hirshhorn Museum to the east and the US Department of Agriculture Jamie L. Whitten Building is adjacent to the Freer Gallery to the west. The general area south, southwest, and southeast of the South Mall Campus is populated by federal office buildings such as the Federal Aviation Administration, US Department of Energy, GSA, US Department of Housing and Urban Development, US Department of Homeland Security, and the US Postal Service. The closest residential neighborhood is located approximately ½-mile south of the South Mall Campus in the area known as Southwest DC. Implementation of the Master Plan would not require any current SI employees to relocate their residence nor would it include the construction of any new housing. Although SI intends a modest increase in employment at the South Mall Campus, this would not have a measurable impact on available housing in the vicinity. Therefore, this topic was not studied in detail in this EIS.

4.2.12 ECONOMY AND EMPLOYMENT

Washington, DC serves as the economic core of the Washington Metropolitan Area, which includes Northern Virginia, central and southern Maryland, and West Virginia. This area has 6.1 million residents, 3.28 million jobs and a gross domestic product (GDP) of \$491 billion, which is the fifth largest in the country (Washington DC Economic Partnership 2010).

The hospitality and tourism industry is a substantial contributor to the District and regional economy and supports almost 75,000 jobs in the District. The number of visitors to DC has steadily increased since 2012, reaching a record 21.3 million visitors in 2015. This generated approximately \$757 million in tax revenue for the District. The hospitality and tourism industry is expected to continue to grow as Washington, DC expands its restaurant and nightlife scene and adds to its cultural offerings (DC Economic Strategy Report, 2017).

Implementation of the Master Plan would result in a short-term need for construction workers. The number of construction workers involved in implementing the South Mall Campus Master Plan would be minimal in comparison to the overall number of construction workers employed in the DC area and most would already be employed. Spending by construction companies and construction workers would provide temporary increases in revenue for local businesses.

The South Mall Campus Master Plan would add program space and visitor amenities which could draw additional visitors to the South Mall Campus from other Smithsonian Museums and the surrounding area. The increase in visitors would positively affect the local and regional economy, especially the hospitality and tourism industry, by increasing spending on food and beverages, overnight amenities, and retail purchases.

SI would add a modest amount of retail, operations and management, and audio and visual staff to support new programs expanded under the Master Plan. This

would result in an increase in employment opportunities and a long-term benefit to the local economy. The number of employees to be added is not known at this time, but it is not likely to be substantial. The largest potential for increased employment is at the AIB, but its permanent use is not yet determined.

Because impacts to the local and regional economy and area employment are expected to be beneficial, this topic is not studied in detail in this EIS.

4.2.13 ENVIRONMENTAL JUSTICE

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority or low-income populations.

A low-income individual is defined as any individual receiving a total family income below the applicable poverty threshold, as derived from the Office of Management and Budget's (OMB) Statistical Policy Directive 14. Information regarding poverty status of individuals is available from the US Census Bureau at the census tract level. A low-income population is defined as any census tract with a higher percentage of low-income individuals than the county population as a whole. A minority individual is defined as any individual that is nonwhite or identifies as Hispanic or Latino. A minority population is defined as any group of people living in geographic proximity with a population that is 50 percent minority or greater (CEQ, 1997).

The South Mall Campus is located within Census Tract 62.02 which is comprised almost entirely of federally-owned land. The adjacent Census Tract, Census Tract 102, is comprised mostly of federal office buildings and a portion of the

Southwest DC neighborhood. Selected population data within these Census Tracts are shown below in Table 4-1.

Table 4- 1. Selected Census Tract Population Data

Geography	Total Population	Minority (%)	Poverty Level (%)
Census Tract 62.02	33	78.8	0
Census Tract 102	2,324	51.3	10.6
Washington, DC	584,400	61.9	18.5

Source: US Census Bureau, 2010

Based on population statistics from the 2010 Census, minority populations occur within Census Tract 62.02. The minority population residing in Census Tract 62.02 is likely located over 1 mile away from the South Mall Campus, in the vicinity of the Library of Congress located at 101 Independence Avenue, SE. Low income and minority individuals also reside within Census Tract 102. Implementation of the Master Plan would result in increased access to SI exhibits and programs by all populations in the vicinity of the South Mall Campus. SI facilities are free to the public which encourages visitors of all socioeconomic status. The implementation of the Master Plan would not have disproportionately high adverse human health or environmental effects on these individuals and groups. Any adverse impacts experienced by low income and minority populations would be the same as those experienced by the overall population; therefore, Environmental Justice has not been studied in detail in this EIS.

4.3 WHAT RESOURCES HAVE BEEN INCLUDED FOR FURTHER ANALYSIS?

Impact topics analyzed in detail in this EIS are those resources of concern that would see a minor, moderate, or major effect, either beneficially or adversely, with implementation of the South Mall Campus Master Plan. The following resources have been assessed in detail for the No-Action Alternative and Alternatives B, D, and F:

- Topography and Soils
- Seismic Vulnerability
- Stormwater Management
- Air Quality
- Greenhouse Gases, Climate Change, and Energy Consumption
- Cultural Resources
- Visual Quality
- Land Use Planning and Policies
- Traffic and Transportation
- Visitor Use and Experience
- Human Health and Safety
- Utilities
- Waste Management

4.4 TOPOGRAPHY AND SOILS

4.4.1 WHAT ARE THE TOPOGRAPHIC AND SOIL CONDITIONS AT THE SOUTH MALL CAMPUS?

The South Mall Campus is shown on the Washington West US Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 4-2) . Topography throughout the South Mall Campus is generally flat, with the exception of the sunken Sculpture Garden across Jefferson Drive, SW.

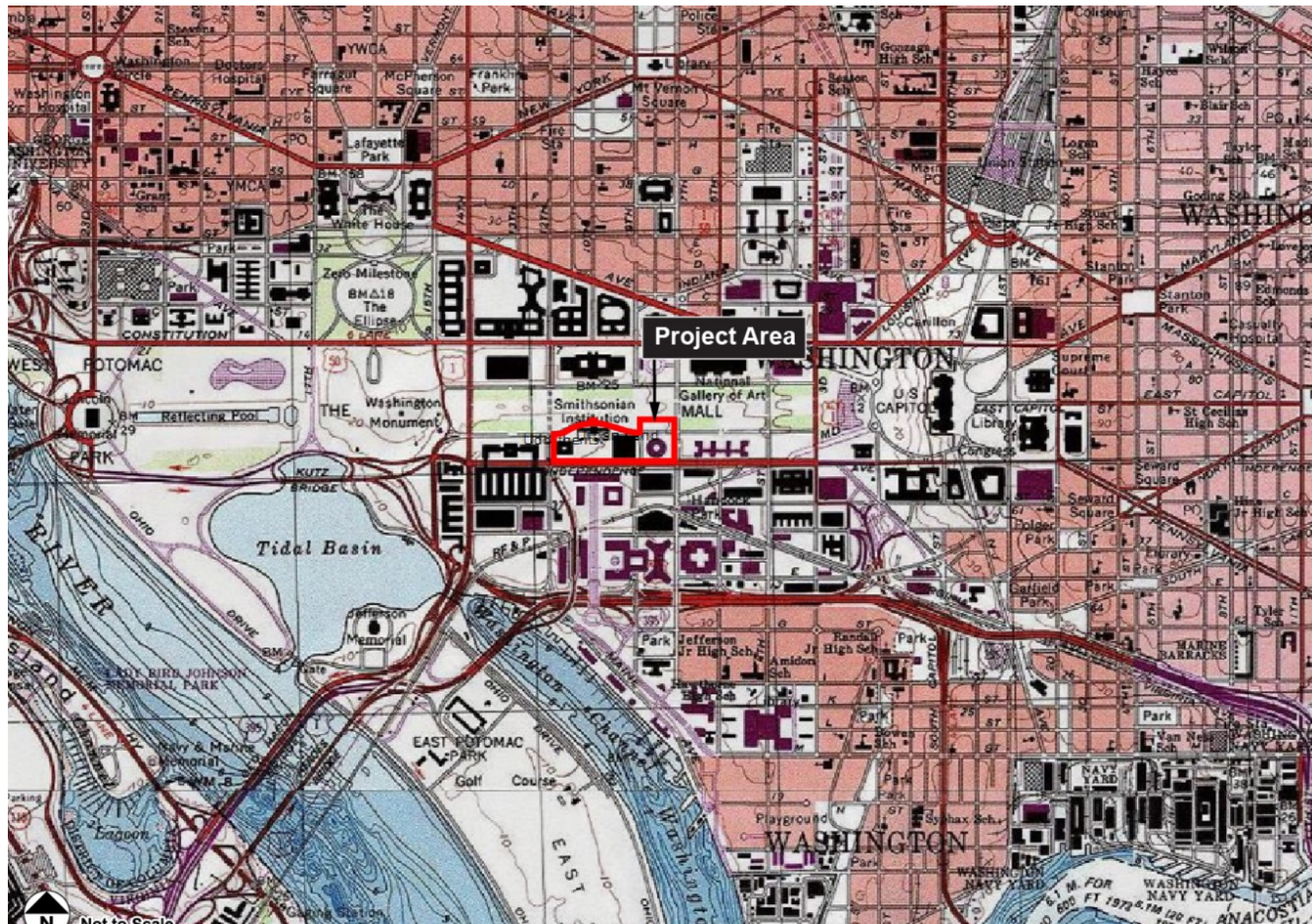


Figure 4- 2. USGS Topographic Map (Source: USGS 2014).

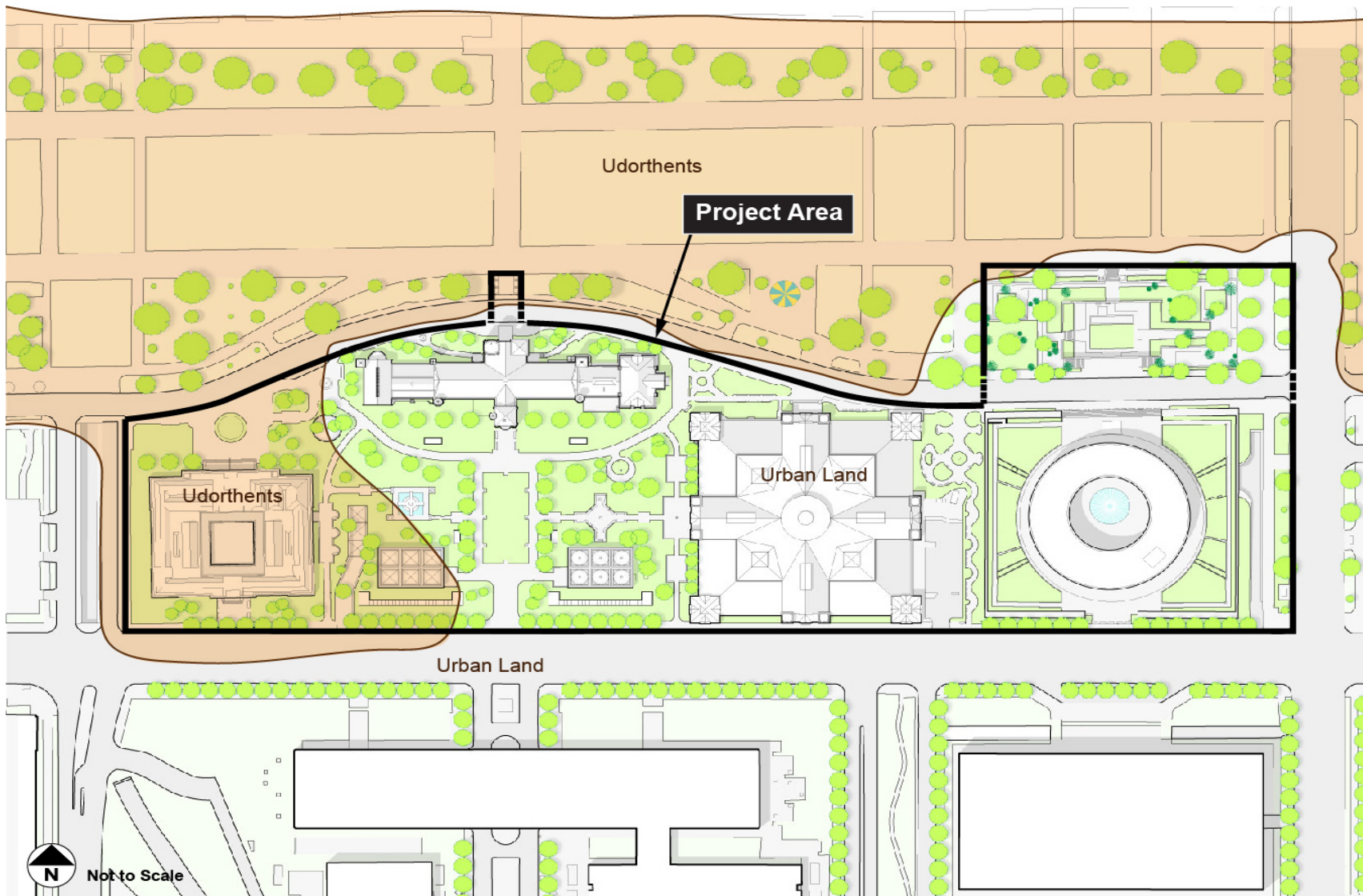


Figure 4- 3. Existing Soils on the South Mall Campus (Source: NRCS, 2017).

Two soil types are present within the South Mall Campus (NRCS, 2017). The western portion of the South Mall Campus consists of Udorthents, a highly heterogeneous type of fill material, and the remaining 78 percent consists of urban fill (Figure 4-3). These soils consist primarily of sand and gravel with various amounts of silt (Haley & Aldrich, 2014). No undisturbed soil profile currently exists anywhere onsite. The South Mall Campus has been heavily disturbed beginning in the mid-1800s, when construction of the Castle and AIB began. The underground Quadrangle Building, which was completed in 1987, extends 56 feet below grade. Soils in the Haupt Garden above the Quadrangle Building are a maximum of 6 feet deep and are managed to support vegetation.

4.4.2 HOW WILL TOPOGRAPHY AND SOILS BE AFFECTED BY THE PROPOSED MASTER PLAN ALTERNATIVES?

4.4.2.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

Under the No-Action Alternative, no major excavation of soils would occur and there would be no changes in the topography of the site. The soils in the Haupt Garden would be temporarily displaced to repair the existing roof membrane of the Quadrangle Building. Soils in the Haupt Garden are managed for vegetation, and no natural or undisturbed soil profiles exist. Minimal ground disturbance may occur as a result of continued repairs to existing underground utilities throughout the South Mall Campus. Since soils in the areas of existing utilities have already been disturbed, routine repairs to existing utility systems would not impact any undisturbed, intact soil layers. Therefore, the No-Action Alternative would result in short-term, negligible, adverse impacts to soils that have been previously disturbed.

After construction, displaced soil would be reused or replaced with soil of a similar type. Disturbed areas would be restored to pre-construction conditions. Therefore, no long-term adverse impacts are anticipated.

INDIRECT IMPACTS

Construction activities would temporarily expose and disturb soils which would potentially result in soils migrating offsite or entering the municipal stormwater system. An erosion and sediment control plan would be developed and implemented to minimize the potential for exposed soils to be transported offsite during construction. With implementation of an erosion and sediment control plan, there would be short-term, negligible, adverse indirect impacts from soil exposure. No long-term, indirect impacts to soils are anticipated because the site would be restored and disturbed soils would be stabilized.

4.4.2.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

Construction activities, including excavation, demolition, and grading, would temporarily expose and disturb existing soils underneath and immediately surrounding the South Mall Campus buildings. Under all of the Master Plan Alternatives, soils would be excavated to a depth of at least 20-30 feet beneath the entire footprint of the Castle to underpin the foundation, complete the seismic reinforcement/enhancement, and lower the basement floor to provide adequate headroom. Excavation of soils would also occur immediately south of the Castle to construct the new below-grade Visitor Center and to create associated connections to the Castle and the Quadrangle Building. Soils would also be excavated to construct the new below grade central loading facility and loading ramp entrance to the west of the Freer Gallery.

The Quadrangle Building roof membrane would be replaced, which would require the removal of the soils in the Haupt Garden. The Ripley Garden would be expanded and would remain at-grade under all Master Plan Alternatives, so minor grading, leveling, and soil disturbance would be required in this area.

In addition, under all of the Master Plan Alternatives, soils would be disturbed to remove the surface parking lot east of AIB, expand the Ripley Garden, and to install perimeter security elements around the entire Campus.

Soils onsite currently consist of urban fill and were mostly previously disturbed and compacted from previous development, so no impacts to previously undisturbed soil would occur. If any fill is needed, excavated soils would be reused to the extent practical. Any other fill used would be similar to the existing urban soil types onsite. Fill would be tested for hazardous materials and structural suitability prior to use.

Excavation and soil disturbance could increase the risk of uneven foundation settlement during construction. To reduce these risks, a preconstruction survey would be conducted prior to any underground excavation. Monitoring systems would be established in the interior and exterior of affected buildings to protect against vibration and settlement related damage during construction (RSA, 2015a).

The exposure of soils during construction of the elements common to all Master Plan Alternatives would result in short-term, minor, adverse impacts to soils.

The proposed excavation described above would permanently remove soils and potentially alter the soil profile on the South Mall Campus. Buildings and underground structures adjacent to excavated areas would be permanently underpinned to prevent any long-term settlement related damage. The topography of the site would be permanently altered through the construction of the loading ramp along to the west of the Freer Gallery. Therefore, the elements common to all Master Plan Alternatives would result in long-term, minor, adverse impacts to previously disturbed, urban soils and to the South Mall Campus' topography. However, the removal of the parking lot at AIB to expand the Ripley Garden and the removal of the loading area next to the Freer Gallery would add soils where none currently exist.

INDIRECT IMPACTS

Construction activities would temporarily expose and disturb soils which would potentially result in soils migrating offsite or entering the municipal stormwater system. An erosion and sediment control plan would be developed and implemented, in accordance with DOEE regulations, to minimize the potential for exposed soils to be transported offsite during construction. With implementation of an erosion and sediment control plan, there would be short-term, negligible, adverse indirect impacts from soil exposure.

Disturbed areas would be revegetated and/or permanently stabilized following construction. Therefore, no long-term, indirect impacts to soils are anticipated.

4.4.2.3 ALTERNATIVE B

DIRECT IMPACTS

Alternative B includes the elements common to all Master Plan Alternatives. In addition to the impacts of the common elements, additional soils would be excavated under Alternative B. Under Alternative B, limited sub-basement excavation would occur under the west wing of the Castle for the central loading facility. Construction of the proposed visitor center and entrance would require further excavation under the Castle. Excavation of soils would be necessary for construction of the proposed central utility plant and would require underpinning of the west wall of the AIB, the west foundation of the Freer Gallery, and the retaining wall along the 12th Street underpass.

Soils would be brought into the site to replant the Haupt Garden in its current location after replacement of the Quadrangle Building roof membrane.

The Sculpture Garden would remain at its current grade, and no excavation for the Sculpture Garden or for restoration of the tunnel would be required. While Alternative B would require more extensive excavation and underpinning for the AIB compared to Alternative D, Alternative B minimizes the total footprint of

excavation on the South Mall Campus compared to Alternative D, particularly underneath the Castle and the Sculpture Garden (See Figure 4-4). Therefore, Alternative B would result in short- and long-term, moderate, adverse impacts to soils that have been previously disturbed.

INDIRECT IMPACTS

Indirect impacts to soils under Alternative B would be similar to the impacts discussed under elements common to all Master Plan Alternatives.

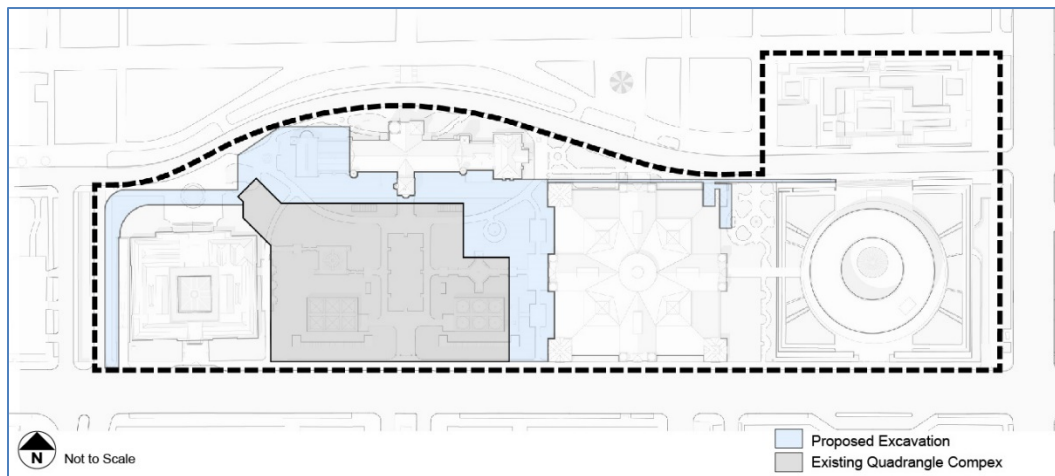


Figure 4- 4. Proposed Excavation Footprint under Alternative B (Source: BIG, 2017).

4.4.2.4 ALTERNATIVE D

DIRECT IMPACTS

Alternative D includes the elements common to all Master Plan Alternatives. In addition to the impacts of the common actions, additional soils would be excavated under Alternative D. Under Alternative D, the subbasement excavation of the Castle would include the entire footprint of the Castle and

beyond the footprint to accommodate the central utility plant and loading facility. The Visitor Center would be located in the basement directly underneath the Castle and would connect to the Quadrangle Building. The tunnel from the Hirshhorn Museum to the Sculpture Garden would be expanded, and the Sculpture Garden would be elevated and reconfigured to accommodate new below-grade galleries. These activities would require permanent associated excavation under Jefferson Drive, SW and the existing Sculpture Garden. By locating the central utility plant underneath the Castle basement, extensive excavation would be required under the Castle. The northwest corner foundation of the AIB would need to be underpinned, so minor excavation would still be required adjacent to the AIB. Alternative D would result in the largest overall footprint of excavation compared to the other Master Plan Alternatives (see Figure 4-5). Therefore, Alternative D would result in short- and long-term, major, adverse impacts to soils that have been previously disturbed.

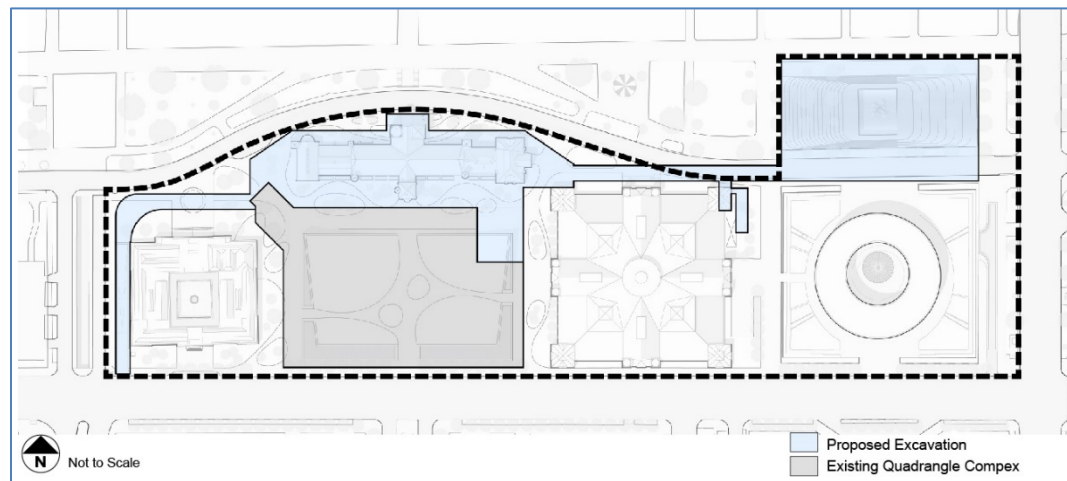


Figure 4- 5. Proposed Excavation Footprint under Alternative D (Source: BIG, 2017).

INDIRECT IMPACTS

Indirect impacts to soils under Alternative D would be similar to the impacts discussed under elements common to all Master Plan Alternatives.

4.4.2.5 ALTERNATIVE F

DIRECT IMPACTS

Alternative F includes the elements common to all Master Plan Alternatives. In addition to the impacts of the common actions, additional soils would be excavated under Alternative F. Alternative F would result in the same depth and footprint of excavation in the area of the Castle and AIB as Alternative B. Under Alternative F, the tunnel from the Hirshhorn Museum to the Sculpture Garden would be expanded, and the Sculpture Garden would be elevated and reconfigured to accommodate new below-grade galleries. These activities would require permanent excavation under Jefferson Drive, SW and the existing Sculpture Garden. Similar to Alternative B, Alternative F would require more extensive excavation and underpinning for the AIB compared to Alternative D. However, Alternative F minimizes excavation underneath the Castle (see Figure 4-6).

INDIRECT IMPACTS

Indirect impacts to soils under Alternative F would be similar to the impacts discussed under elements common to all Master Plan Alternatives.

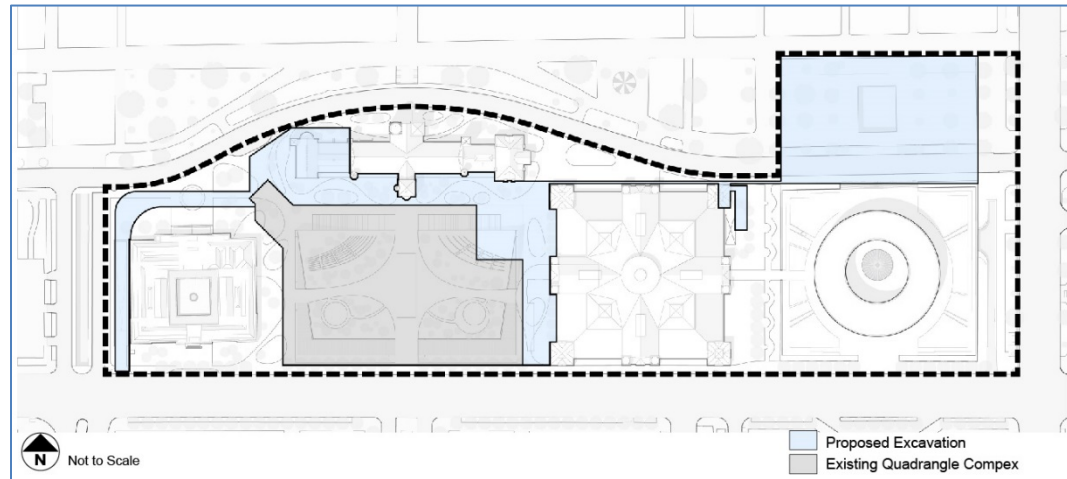


Figure 4- 6. Proposed Excavation Footprint under Alternative F (Source: BIG, 2017).

4.4.3 WHAT MEASURES WILL BE TAKEN TO ENSURE THAT EROSION AND SEDIMENTATION ARE CONTROLLED DURING CONSTRUCTION?

By implementing an erosion and sediment control plan as described under elements common to all Master Plan Alternatives, the South Mall Campus Master Plan would be in compliance with DOEE regulations. If soils are to be impacted on NPS land, SI would get permits needed from NPS for use of NPS land. No additional mitigation is required.

4.5 SEISMIC VULNERABILITY

4.5.1 WHAT ARE THE SEISMIC CONDITIONS AT THE SOUTH MALL CAMPUS?

The District of Columbia is within the Central Virginia Seismic Zone (USGS, 2011). Although the District of Columbia is within a low seismic hazard area, earthquakes have been reported as early as 1774 in central Virginia and the surrounding region. A total of six earthquakes of at least 4.0 magnitude have been recorded in the Central Virginia Seismic Zone since 1973. The most severe

earthquake ever detected in this area, at magnitude 5.8, occurred in August 2011 near Mineral, Virginia, approximately 82.5 miles southwest of the South Mall Campus. All Smithsonian structures in the Washington, DC area were affected (SI Facilities, 2015). The structures on the South Mall Campus in particular are reported to have experienced moderate shaking.

The following codes and standards apply to seismic reinforcements in existing buildings:

- International Building Code (IBC 2012);
- International Existing Building Code (IEBC 2012);
- Seismic Rehabilitation of Existing Buildings (American Society of Civil Engineers [ASCE] 41-13);
- Minimum Design Loads for Buildings and Other Structures (ASCE 7-10); and
- Standards of Seismic Safety for Existing Federally Owned and Leased Buildings, ICSSC Recommended Practice 8 (RP 8).
- Executive Order 13717: Establishing a Federal Earthquake Risk Management Standard

CASTLE

Six seismic reports and studies have been prepared between 1988 and 2015 to assess the Castle's needs for seismic reinforcement. These studies show that the Castle building is not currently in compliance with the above referenced seismic codes and regulations.

In the 2015, Seismic Feasibility Study for the Castle (RSA, 2015b), the above referenced codes were used to develop various models to test the resilience of the Castle during a seismic event. The Castle is particularly vulnerable to seismic activity due to its high, long, narrow shape; tall, unbraced towers and chimneys; and construction of unreinforced masonry walls that lack sturdy

connections to the floors and roof. The study found that an earthquake could result in cracking in the masonry, non-linear rocking in the towers, separations between the main building and the towers, and collapses of towers and floors. Due to extensive visitor and employee use, the Castle's seismic weaknesses represent a substantial risk to human life, substantial economic impact, loss or damage to NHL building fabric, and mass disruption if the building were to fail or collapse.

These weaknesses were evident in the aftermath of the 2011 earthquake. The Castle experienced significant damage and had to be closed to the public and staff for several days. Several of the chimneys and roof ornaments cracked or lost stones. Plaster walls and ceilings in the interior of the building cracked or fell. The unreinforced masonry partitions led to cracks in the walls of the East Wing of the Castle and the stairwells in the North Tower. Some immediate repairs and stabilization took place, and repairs continued through 2013. Additional construction is still needed, including reinforcing the foundation and shear walls, in order to protect the Castle from earthquake damage and bring it up to code.

ARTS AND INDUSTRIES BUILDING

A seismic reinforcing feasibility study for the AIB, conducted in 2009 by McMullan & Associates, identified several seismic deficiencies that are inconsistent with current codes. The deficiencies include walls, piers, and chimney that are constructed of unreinforced masonry; inadequate horizontal bracing between masonry piers; poor connections between walls, piers, towers, and roof; and non-uniform stiffness throughout the building. These deficiencies could result in cracking and separations at the connections between stiff and flexible elements (McMullan & Associates, 2009).

No additional seismic studies have been completed for the Freer Gallery, Hirshhorn Museum and Sculpture Garden, or the Quadrangle Building. These buildings are less vulnerable due to their newer construction.

4.5.2 WHAT IMPACTS WILL SEISMIC UPGRADES HAVE ON THE SOUTH MALL CAMPUS?

4.5.2.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

Under the No-Action Alternative, no seismic retrofits would be performed. The seismic deficiencies in the Castle and AIB would not be addressed, and the buildings on the South Mall Campus would remain vulnerable to seismic activity. Since the South Mall Campus's vulnerability to earthquakes would not change, the No-Action Alternative would have no short-term impacts to seismic vulnerability.

However, in the event of an earthquake in the future, the Castle and AIB would likely experience additional damage, including but not limited to cracking in the masonry, non-linear rocking in the towers, separations between the main building and the towers, and collapses of towers and floors. Due to extensive visitor and employee use, the No-Action Alternative presents a risk to human life and economic impact in the event of a future earthquake. Therefore, the No-Action Alternative would not protect buildings on the South Mall Campus from seismic vulnerability and would result in long-term, major, adverse impacts in the event of a seismic event.

INDIRECT IMPACTS

There would be no indirect impacts to seismic vulnerability under the No-Action Alternative.

4.5.2.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

Section 110 of the NHPA requires federal agencies to exercise a higher standard of care when considering undertakings and to undertake planning and actions to minimize the harm to National Historic Landmarks (NHL). The Castle and the AIB are NHLs that warrant the best and most comprehensive approach to protecting the resources. To this end, preconstruction surveys would be conducted for future projects of the Master Plan prior to any underground excavation to identify seismic deficiencies. Underpinning would be installed in accordance with all applicable codes and standards. Monitoring systems would be established in the interior and exterior of each building to protect against vibration and settlement related damage during construction (RSA, 2015a). If an earthquake were to occur during construction, the temporary methods used to underpin or stabilize the foundations of the Castle and other Campus buildings may temporarily increase their seismic vulnerability. Therefore, the elements common to all Master Plan Alternatives would result in short-term, minor, adverse impacts to the seismic vulnerability of the South Mall Campus buildings.

Under all Master Plan Alternatives, the Castle would be retrofitted for seismic resistance. The base isolation method would require limited aboveground reinforcement in the towers, parapets, and chimneys, which would minimize the impacts to the historic character of the Castle (See Figure 4-7). Traditional seismic reinforcement would require extensive cross-bracing and stiffening throughout the Castle, which would substantially impact the historic fabric of the Castle (See Figure 4-8). Therefore, a combination of the two methods would be utilized because the base isolation method would limit the forces a seismic event would have on the building. By limiting the force, you can limit the amount of cross-bracing that would be needed, which would allow for more of the Castle's defining historic features to be preserved (e.g., double height spaces, vaulted ceilings, etc.). The proposed base isolation and limited

aboveground reinforcement would reduce seismic risks to the Castle by two to three times compared to its current condition (RSA, 2015c).

Under all of the Master Plan Alternatives, the AIB would be protected against seismic events with progressive collapse measures. Additional structural underpinning would be added to the west side of the AIB foundation to support the building and allow for below-grade excavation.

While no specific seismic retrofits are proposed for the other South Mall Campus buildings at this time, preconstruction surveys would be conducted for each phase of the Master Plan to identify seismic deficiencies and to determine if retrofits are needed to protect structures. If needed, all foundation underpinning and improvements to building envelopes would be constructed to comply with current codes and standards, including seismic, resulting in an overall improvement to seismic vulnerability. Therefore, the seismic upgrades proposed under all Master Plan Alternatives would result in a long-term, major, beneficial impact to the seismic vulnerability of the South Mall Campus.

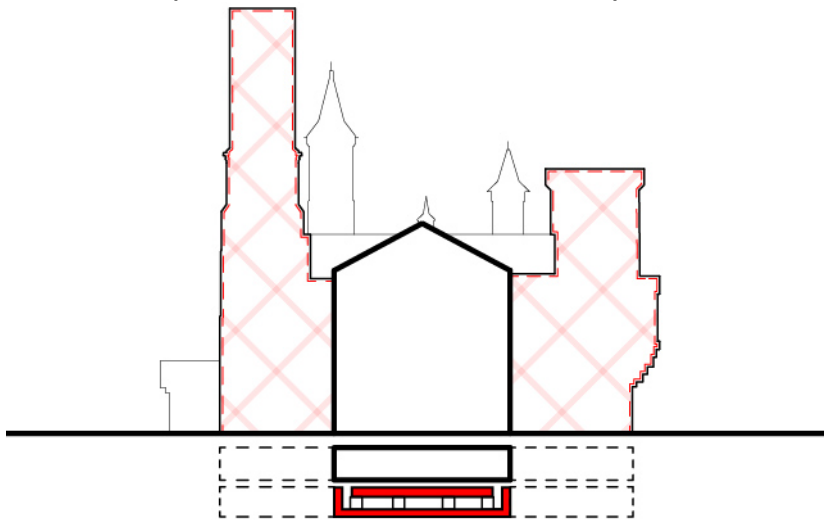


Figure 4- 7. Base Isolation Method

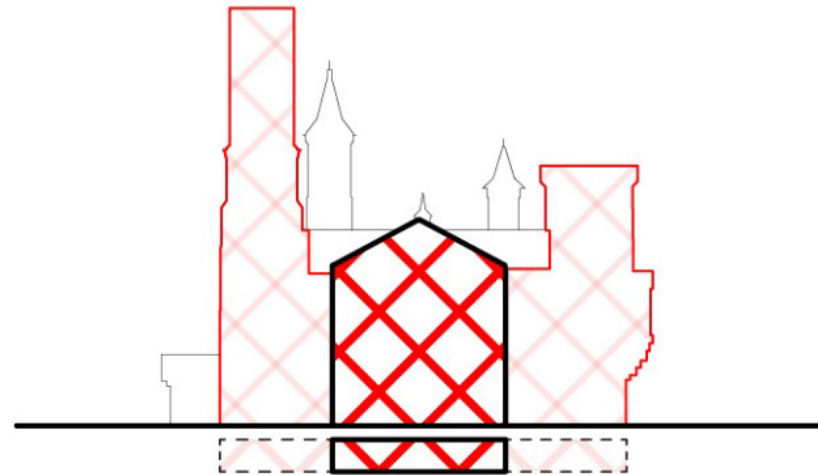


Figure 4- 8. Traditional Cross-Bracing Method

INDIRECT IMPACTS

There would be no indirect impacts to seismic vulnerability from the elements common to all Master Plan Alternatives.

4.6 STORMWATER MANAGEMENT

4.6.1 HOW HAS STORMWATER MANAGEMENT AT THE SOUTH MALL CAMPUS BEEN PROVIDED?

Most stormwater on the South Mall Campus drains directly to the District's Municipal Separate Storm Sewer System (MS4), operated by DOEE. A small portion of the South Mall Campus around the Hirshhorn Sculpture Garden adjoins the combined sewer system (CSS) and stormwater in that area could drain into the CSS. The South Mall Campus consists of approximately 56 percent impervious surface, including buildings, parking areas, roads, sidewalks, and contained water features. This includes the Parterre of the Haupt Garden, which is underlain by the Quadrangle Building, so the potential for stormwater retention and infiltration is limited. Drainage systems on the buildings in the South Mall Campus are generally deteriorated, which has led to rust, uncoupling, and/or leaks. Several of the buildings do not have emergency secondary drains or overflow systems, which can lead to backups, pooling, and water damage to the building interior.

In 2013, the District issued the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control (21 DCMR Chapter 5), which aims to reduce the overall volume of stormwater pollution entering District waterbodies. Under the 2013 Rule, major land-disturbing activities are required to retain on-site a minimum of 50 percent of all rainfall up to a 1.2-inch storm event. The remaining volume retention can be accomplished off-site, if necessary. All major regulated projects are required to submit a Stormwater Management Plan (SWMP) in accordance with the 2013 Rule and the details outlined within the

2013 Stormwater Management Guidebook (DDOE/Center for Watershed Protection, 2013).

4.6.2 HOW WOULD THE ALTERNATIVES AFFECT STORMWATER?

4.6.2.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

Under the No-Action Alternative, no changes to the configuration of the existing stormwater system, the amount of impervious surface, or the amount of green space on the South Mall Campus would occur. Basic maintenance and localized repair of the existing stormwater system would continue as needed. Therefore, no new short- or long-term impacts to stormwater would occur under the No-Action Alternative.

INDIRECT IMPACTS

Construction activities related to the repair of the Quadrangle Building roof membrane and maintenance of existing underground utilities could temporarily expose and disturb soils, which would potentially result in increased soil erosion that could travel offsite or enter the municipal stormwater system. An erosion and sediment control plan would be developed in accordance with DCEE regulations to minimize the potential for eroded soils to be transported offsite during construction. Therefore, the No-Action Alternative would result in short-term, negligible, and adverse impacts related to stormwater. Stormwater on the South Mall Campus would continue to drain to the MS4 and to some extent the CSS indefinitely, with no changes to stormwater quantity or quality. However, there would continue to be a limited ability to retain and filter stormwater before it is discharged. Therefore, a long-term, minor, indirect impact to stormwater would continue under the No-Action Alternative.

4.6.2.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

Under all Master Plan Alternatives, clearing of vegetation and green space during construction would temporarily reduce the site's ability to absorb stormwater, which could potentially increase the amount of stormwater generated onsite during storm events. The operation of construction equipment could potentially result in spills of hazardous materials or petroleum products onsite. These impacts would be temporary and would be minimized by implementing Best Management Practices (BMPs) during construction, including but not limited to silt fences, erosion matting, curb inlet protection, hay bales, and revegetation of exposed sediment. An erosion and sediment control plan and SWMP would be developed in accordance with DOEE regulations and implemented during construction. Therefore, the elements common to all Master Plan Alternatives would have short-term, minor, adverse impacts to stormwater.

Under all of the Master Plan Alternatives, a loading ramp entrance would be constructed to the west of the Freer Gallery. This action may result in an increase in impervious surface and, therefore, increase stormwater runoff on the site. However, the surface parking lot east of the AIB would be removed, the Quadrangle loading adjacent to the Sackler Gallery would be removed and relocated, and the Ripley Garden would be expanded resulting in a decrease in impervious surfaces. In comparison to the existing condition, the amount of impervious surface, overall, would decrease as follows:

- Alt B: approx. 4,500 sf less impervious surface;
- Alt D: approx. 11,000 sf less impervious surface; and
- Alt F: approx. 18,000 sf less impervious surface.

Under all Master Plan Alternatives, the Haupt Garden would be reinstalled and would function as an upgraded green roof above the Quadrangle Building

including expansion into the area now occupied by the Sackler service ramp. Pervious pavers, bioretention areas, and additional plantings and green space would be added wherever possible.

Under all Master Plan Alternatives, the existing stormwater drainage systems throughout the South Mall Campus would be upgraded. One or more cisterns would be provided either near the central utility plant or in the sub-basement of the Castle to capture and store stormwater drainage from the Castle and AIB roofs. This stormwater would then be reused to irrigate the South Mall Campus gardens or to flush toilets. An ultra-violet treatment system would be installed in the stormwater capture system to prevent harmful bacteria growth. Oil-water separators would be installed in the central loading facility and ramp to ensure that no contaminated water enters the cisterns or drains offsite.

By reducing impervious surface, installing the stormwater capture and reuse system, and providing green infrastructure, all Master Plan Alternatives would comply with the District's 2013 Stormwater Rule. Therefore, the elements common to all Master Plan Alternatives would have a long-term, moderate, beneficial impact related to stormwater.

INDIRECT IMPACTS

Under all Master Plan Alternatives, construction activities would temporarily expose and disturb soils, which could potentially result in increased soil erosion. The operation of construction equipment could potentially result in spills of hazardous materials or petroleum products. During storm eventtablets, these eroded sediments and contaminants could travel off-site or enter the municipal stormwater system. These impacts would be temporary and would be minimized as much as possible by implementing BMPs during construction, including but not limited to silt fence, erosion matting, curb inlet protection, hay bales, and revegetation of exposed sediment. An erosion and sediment control plan and SWMP would be developed in accordance with DOEE regulations and

implemented during construction. Therefore, the elements common to all Master Plan Alternatives would have a short-term, minor, adverse impact to stormwater.

All Master Plan Alternatives would reduce the overall volume of stormwater entering the MS4 and the CSS and therefore reduce stormwater pollution in the Potomac River, the Anacostia River, and other District waterways compared to the No-Action Alternative. Therefore, the elements common to all Master Plan Alternatives would have long-term, moderate, beneficial, indirect impacts to stormwater in the overall region.

4.6.2.3 ALTERNATIVE B

DIRECT IMPACTS

Alternative B includes the elements common to all Master Plan Alternatives. The additional construction activities included in Alternative B such as excavations for a limited sub-basement area and visitor center adjacent to the Castle and construction of a new utility plant would occur below-grade and therefore would not add to the stormwater impacts of the proposed action. Therefore, Alternative B, like the elements common to all Master Plan Alternatives, would have long-term, moderate, beneficial, indirect impacts to stormwater in the overall region.

INDIRECT IMPACTS

In addition to the impacts of elements common to all Master Plan Alternatives, under Alternative B, soils would be disturbed for excavations for sub-basement area and visitor center adjacent to the Castle and construction of a new utility plant below-grade, and for removing a portion of the Hirshhorn Plaza west wall. During storm events, exposed soils could travel off-site or enter the municipal stormwater system. As described under elements common to all Master Plan Alternatives, these impacts would be temporary and would be minimized as much as possible by implementing BMPs in accordance with an erosion and

sediment control plan and SWMP. Therefore, Alternative B would have a short-term, minor, adverse impact to stormwater.

Alternative B would have the same long-term, moderate, beneficial, indirect impacts to stormwater in the overall region as the elements common to all Master Plan Alternatives.

4.6.2.4 ALTERNATIVE D

DIRECT IMPACTS

Alternative D includes the elements common to all Master Plan Alternatives. Alternative D also includes excavations for sub-basement loading facilities and visitor center under the Castle and construction of a new utility plant. These actions would occur below-grade and therefore would not add to the stormwater impacts of the proposed action.

Expanding the Haupt Garden by reducing the footprint of the Quadrangle Building entry pavilions and removing the Sackler loading ramp and reconfiguring garden pathways would decrease impervious surfaces on the South Mall Campus which in turn would improve infiltration of stormwater and reduce runoff. Therefore, Alternative D would have a long-term, moderate, beneficial, indirect impacts to stormwater in the overall region.

INDIRECT IMPACTS

In addition to the impacts of elements common to all Master Plan Alternatives, under Alternative D, soils would be disturbed for excavations for sub-basement loading facilities and visitor center under the Castle and construction of a new utility plant below-grade; to reconfigure the Sculpture Garden to include new gallery space; to expand the tunnel from the Hirshhorn Museum to the Sculpture Garden; and to remove a portion of the Hirshhorn Plaza north, east, and west wall. During storm events, exposed soils could travel off-site or enter the municipal stormwater system. As described under elements common to all

Master Plan Alternatives, these impacts would be temporary and would be minimized as much as possible by implementing BMPs in accordance with an erosion and sediment control plan and SWMP. Therefore, Alternative D would have a short-term, minor, adverse impact to stormwater.

Alternative D would have the same long-term, moderate, beneficial, indirect impacts to stormwater in the overall region as the elements common to all Master Plan Alternatives.

4.6.2.5 ALTERNATIVE F

DIRECT IMPACTS

Alternative F includes the elements common to all Master Plan Alternatives. Alternative F also includes excavations for limited sub-basement loading space and visitor center adjacent to the Castle and construction of a new utility plant. These actions would occur below-grade and therefore would not add to the stormwater impacts of the proposed action.

Expanding the Haupt Garden would decrease impervious surfaces on the South Mall Campus which in turn would improve infiltration of stormwater and reduce runoff. Therefore, Alternative F would have a long-term, moderate, beneficial, indirect impacts to stormwater in the overall region.

INDIRECT IMPACTS

In addition to the impacts of elements common to all Master Plan Alternatives, under Alternative F, soils would be disturbed for excavations for a limited sub-basement loading facility and visitor center adjacent to the Castle and construction of a new utility plant below-grade; to install new museum entrance pavilions; to reconfigure the Sculpture Garden to include new gallery space; to expand the tunnel from the Hirshhorn Museum to the Sculpture Garden; and to remove a portion of the Hirshhorn Plaza west wall. During storm events, exposed soils could travel off-site or enter the municipal stormwater system. As

described under elements common to all Master Plan Alternatives, these impacts would be temporary and would be minimized as much as possible by implementing BMPs in accordance with an erosion and sediment control plan and SWMP. Therefore, Alternative F would have a short-term, minor, adverse impact to stormwater.

Alternative F would have the same long-term, moderate, beneficial, indirect impacts to stormwater in the overall region as the elements common to all Master Plan Alternatives.

4.6.3 WHAT TYPES OF STORMWATER QUANTITY AND QUALITY CONTROL MEASURES WOULD BE IMPLEMENTED UNDER THE MASTER PLAN ALTERNATIVES?

By implementing an erosion and sediment control plan and SWMP, reducing impervious surface, installing the stormwater capture and reuse system, and providing green infrastructure as described under elements common to all Master Plan Alternatives, the Master Plan would be in compliance with the District's 2013 Stormwater Rule. No additional mitigation is required.

4.7 AIR QUALITY

4.7.1 ARE THERE ANY AIR QUALITY ISSUES IN THE WASHINGTON METROPOLITAN REGION?

Under the authority of the Clean Air Act (CAA) (USC. Title 42, Chapter 85, 1970, as amended in 1990), the EPA has developed National Ambient Air Quality Standards (NAAQS) for certain air pollutants (criteria pollutants) deemed harmful to public health and the environment. These criteria pollutants include: nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), ozone (O₃), particulate matter (PM_{2.5}/PM₁₀), and lead (Pb). The EPA designates areas where ambient concentrations are below the NAAQS as being in "attainment" and

**Geographic Areas Included in the
Washington Metropolitan Region:**

Maryland
Montgomery County
Prince George's County
Frederick County
Charles County
Calvert County
Virginia
Fairfax County
Arlington County
Prince William County
Loudoun County
City of Alexandria
City of Falls Church
City of Fairfax
City of Manassas
City of Manassas Park
District of Columbia

designates areas where a criteria pollutant level exceeds the NAAQS as being in “nonattainment.”

The Washington Metropolitan Region is designated as a nonattainment area for ground-level O₃ under the 8-hour standard (EPA, 2017b). The 8-hour standard is defined as the 3-year average of the fourth highest daily maximum 8-hour average ozone concentration. In response to the designation the Metropolitan Washington Council of Governments (MWCOC) prepared a State Implementation Plan (SIP) to reduce O₃ in the region. The plan provides an inventory of existing conditions, a projection of future conditions in consideration of regional growth, and an outline of control strategies to achieve air pollutant reduction. The SIP to meet O₃ attainment standards was adopted in May 2007.

In accordance with the CAA, DOEE is responsible for air quality monitoring to protect public health and the environment. The DOEE carries out an EPA-approved air quality management program that includes monitoring, identifying, and implementing control strategies, assessing the results of the control strategies, and measuring progress. Over the last 20 years, the DOEE reports that criteria pollutants have decreased significantly from historic levels due to the implementation of control measures. In the 1980s, the introduction of vehicles equipped with the catalytic converter helped to reduce NO₂ and CO in the air, and the phasing out of leaded gasoline resulted in a significant drop in airborne lead levels. Controls at stationary sources have reduced SO₂ and NO₂. Ozone pollution has also been reduced, but Metropolitan Washington remains in nonattainment (DOEE 2014).

The largest source of air emissions in the District is the operation of motor vehicles. To combat these emissions, DOEE has passed the Engine Anti-Idling Law (DCMR 20-900), which prohibits any vehicle to idle for more than three minutes while parked, stopped, or standing. Exceptions to this rule include the

operation of power takeoff equipment such as dumping beds, cement mixers, content delivery equipment, etc.

In addition to the regional ambient air quality standards, the CAA also imposes National Emission Standards for Hazardous Air Pollutants (NESHAP) for known indoor toxic air pollutants such as asbestos and lead, which are known or suspected carcinogens or other serious health effects. Due to the age of the existing buildings on the South Mall Campus, it is assumed that one or more of the materials described above can be found within portions of buildings to be renovated.

4.7.2 WOULD THE SOUTH MALL CAMPUS MASTER PLAN IMPACT AIR QUALITY IN THE AREA?

4.7.2.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

Under the No-Action Alternative, SI would not undertake any major activities that would involve construction, demolition, or excavation. Minor repairs to the Quadrangle Building roof membrane and other building facades would generate fugitive dust. Emissions from construction vehicles and equipment would generate VOCs and Nitrous Oxides (NO_x) which, when combined in the atmosphere, create harmful ground-level O₃. BMPs would be implemented to reduce fugitive dust and harmful emissions and they would ensure the project is in conformance with the MWCOG SIP. With the implementation of these control measures, construction activities would have a short-term, minor, adverse impact to air quality. In accordance with the District's Air Pollution Control Act, activities related to construction and demolition, which are likely to create fugitive dust, and exhaust emissions would be subject to DOEE's Air Quality Division review and oversight.

Ozone (O₃)

- Common Sources Industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are sources of VOCs and Nox, which combine in the presence of sunlight to form ozone.
- FDA White Oak Master Plan Update Sources : Gas turbines associated with Central Utility Plant, Motor Vehicles

Particulate Matter (PM_{2.5}, PM₁₀)

- Common Sources Power plants, industrial sites, automobiles, construction sites, unpaved roads, smokestacks.
- FDA White Oak Master Plan Update Sources : Gas turbines associated with Central Utility Plant, Motor Vehicles, Construction (temporary)

Carbon Monoxide (CO)

- Common Sources: Motor vehicles, power plants, industrial sites, Construction sites.
- FDA White Oak Master Plan Update Sources : Gas turbines associated with Central Utility Plant, Motor Vehicles, Construction (temporary)

Nitrogen Oxides (NO_x)

- Common Sources Power plants, motor vehicles, construction sites, unpaved roads, smokestacks.
- FDA White Oak Master Plan Update Sources : Gas turbines associated with Central Utility Plant, Motor Vehicles

Sulfur Dioxide (SO₂)

- Common Sources Power plants, motor vehicles
- FDA White Oak Master Plan Update Sources : Gas turbines associated with Central Utility Plant, Motor Vehicles

Lead (Pb)

- Common Sources Industrial Sites, Electricity Generation
- FDA White Oak Master Plan Update Sources : None.

Minor repairs and renovations could result in the disturbance of hazardous materials such as which may cause them to become airborne. Impacts due to the disturbance of hazardous materials are discussed in Section 4.14: Human Health and Safety of this EIS.

Under the No-Action Alternative, outdated mechanical systems would not be replaced with modern efficient units. SI would continue to use GSA steam and chilled water and would repair existing mechanical systems on an as-needed basis. The antiquated mechanical systems contribute to indoor air quality issues and the demand for energy from these units would generate emissions and result in a long-term, minor, adverse impact to air quality.

INDIRECT IMPACTS

No indirect impacts to air quality would occur under the No-Action Alternative.

4.7.2.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

Under all Master Plan Alternatives, construction, demolition, excavation, and renovation activities would temporarily impact air quality. These activities include installing Castle blast protection and seismic bracing; restoring the Castle; renovating the Hirshhorn Museum and Sculpture Garden; replacing the roof membrane of the Quadrangle Building; relocating the loading dock and connecting it to underground facilities; excavating below-grade to accommodate a central utility plant; excavating below the Castle to accommodate seismic bracing and an expanded basement; and installing perimeter security measures. Fugitive dust would be generated during these activities, particularly from the excavation of soil. Emissions from construction vehicles and equipment would generate VOCs and NO_x which, when combined in the atmosphere, create harmful ground-level O₃. BMPs would be implemented to reduce fugitive dust and harmful emissions, and they would ensure the project is in conformance with the MWCOG SIP. With the implementation of these control measures,

construction activities would have a short-term, minor, adverse impact to air quality. In accordance with the District's Air Pollution Control Act, activities related to construction and demolition, which are likely to create fugitive dust, and exhaust emissions would be subject to DOEE's Air Quality Division review and oversight.

Minor repairs and renovations could result in the disturbance of hazardous materials such as which may cause them to become airborne. Impacts due to the disturbance of hazardous materials are discussed in Section 4.14: Human Health and Safety of this EIS.

Under all Master Plan Alternatives, outdated existing mechanical systems would be replaced with modern, energy efficient units. The South Mall Campus would cease the use of GSA steam and chilled water from their Central Heating Plant and SI would construct a below-grade central utility plant (location varies by Master Plan Alternative) to serve the entire South Mall Campus. GSA's Central Heating Plant currently generates electricity and steam using gas-fired turbines while simultaneously generating chilled water using electricity generated by the turbines. Utility plants like the one proposed by SI emit NO_x; however, the new central utility plant would operate using new energy efficient equipment, emissions controls, and natural gas which would have lower emissions than older plants like the GSA facility (Atelier Ten, 2014). Since the project is currently in the Master Plan phase, the size of the central utility plant and equipment are preliminary and not yet known. During the design phase of this project, SI would determine whether the central utility plant would require a New Source Review by DOEE. SI would ensure all mechanical systems would not produce emissions above *de minimis* thresholds or would obtain a Title V permit if the central utility plant is determined to exceed the major source pollutant threshold, and therefore would ensure the project was in conformity with the CAA. Ultimately there would be a long-term, minor, beneficial impact to air

quality as the newer, energy efficient mechanical systems and central utility plant would reduce emissions associated with the South Mall Campus.

INDIRECT IMPACTS

The improvements to mechanical equipment and the use of a natural-gas powered central utility plant would reduce the overall emissions of the South Mall Campus resulting in long-term, minor, beneficial impacts to regional air quality. The elements common to all Master Plan Alternatives would not generate additional vehicular trips and therefore there would be no indirect impacts to air quality.

4.7.2.3 ALTERNATIVE B

DIRECT IMPACTS

Alternative B includes the elements common to all Master Plan Alternatives. In addition to the impacts of the common actions, Alternative B construction activities would include removing the Ripley Center entry pavilion; relocating the entrance of the Sackler Gallery and NMAfA to the north side of the buildings; restoring the original tunnel connection between the Hirshhorn Plaza and Sculpture Garden; and removing a limited portion of the Hirshhorn Plaza west wall. These activities would temporarily impact air quality by creating fugitive dust and exhaust emissions from construction equipment and would add to the short-term, minor, adverse impacts to air quality that would occur due to elements common to all Master Plan Alternatives.

INDIRECT IMPACTS

Indirect impacts from improvements to mechanical equipment and the use of a natural-gas powered central utility plant under Alternative B would be the same as those described under elements common to all Master Plan Alternatives since no additional efficiency measures would be implemented.

Alternative B would result in approximately 46 and 164 additional vehicular trips during week day and Saturday peak hours, respectively. Increases in delay are primarily due to background growth in the study area that is anticipated to occur between 2017 and 2040. Background growth will exceed existing roadway capacity even without the additional trips generated by Alternative B. Mitigation measures, such as adjustments to signal timing and phasing, would be implemented to address the projected delays that were identified in the traffic analysis. With mitigation measures to address projected traffic delays, there would not be a measurable increase in vehicle emissions. Therefore, traffic would have a negligible, long-term, adverse impact on air quality.

4.7.2.4 ALTERNATIVE D

DIRECT IMPACTS

Alternative D includes the elements common to all Master Plan Alternatives. In addition to the impacts of the common actions, additional construction would include constructing a below-grade dip entrance to the Visitor Center; installing new museum entry pavilions; installing new skylights; removing the Ripley Center pavilion; removing Hirshhorn Plaza walls; and expanding the tunnel connection between the Hirshhorn Plaza and Sculpture Garden and Gallery. These activities would temporarily impact air quality by creating fugitive dust and exhaust emissions from construction equipment and would add to the short-term, minor, adverse impacts to air quality that would occur due to elements common to all Master Plan Alternatives.

INDIRECT IMPACTS

Indirect impacts under Alternative D would be the same as those described under elements common to all Master Plan Alternatives since no additional efficiency measures would be implemented and no additional vehicular trips would be generated.

4.7.2.5 ALTERNATIVE F

DIRECT IMPACTS

Alternative F includes the elements common to all Master Plan Alternatives. In addition to the impacts of the common actions, construction would include constructing entrance stairs to the Visitor Center; expanding the extent of skylights; removing the Ripley pavilion; relocating the Sackler Gallery and NMAfA museum pavilions; removing a small portion of the Hirshhorn Plaza west wall; and expanding the tunnel connection between the Hirshhorn Plaza and Sculpture Garden and Gallery. These activities would temporarily impact air quality by creating fugitive dust and exhaust emissions from construction equipment and add to the short-term, minor, adverse impacts to air quality that would occur due to elements common to all Master Plan Alternatives.

INDIRECT IMPACTS

Indirect impacts under Alternative F would be the same as those described under elements common to all Master Plan Alternatives since no additional efficiency measures would be implemented and no additional vehicular trips would be generated.

4.7.3 WHAT WOULD BE DONE TO PROTECT AIR QUALITY DURING CONSTRUCTION?

During construction, demolition, excavation, or renovations, short-term impacts would be mitigated through the use of proper control measures including minimizing vehicle idling times; maintaining emission controls on construction vehicles and equipment; and covering/wetting exposed soils to reduce fugitive dust.

4.7.4 WHAT PERMANENT MEASURES WOULD BE TAKEN TO REDUCE LONG-TERM IMPACTS TO AIR QUALITY?

In order to reduce long-term adverse impacts to air quality, SI would replace outdated mechanical systems that are at the end of their useful lives and construct a new central utility plant. These systems would be replaced with modern, efficient units which would result in a long-term reduction in air emissions.

In order to reduce impacts from additional vehicular trips generated by the implementation of the Master Plan, adjustments to signal timing and phasing would be made to minimize idling times and therefore minimize impacts to air quality. These mitigation measures are discussed in further detail below in the Traffic and Transportation Section.

4.8 GREENHOUSE GASES, CLIMATE CHANGE, AND ENERGY CONSUMPTION

4.8.1 WHAT ARE GREENHOUSE GASES AND HOW DO THEY CONTRIBUTE TO CLIMATE CHANGE?

GHG emissions, released from activities that involve the combustion of fossil fuels, are widely recognized as the main contributing factor to climate change. GHGs such as CO₂, NO_x, and methane (CH₄) absorb and trap heat that is radiated by the earth, preventing it from escaping into the atmosphere. As nations around the world become more industrialized, more GHGs are being emitted, intensifying this natural phenomenon known as the “greenhouse effect”. The result is a change in global temperatures and can also cause changes to patterns and intensities of precipitation, increased frequency, and magnitude of severe weather and/or sea level rise (EPA, 2017).

In 2015, President Obama issued Executive Order 13693, *Planning for Federal Sustainability in the Next Decade* which directs federal agencies to reduce GHG

emissions by 40-percent below 2008 levels by 2025 (The White House, 2015). Additionally, DC has set a goal to reduce GHG emissions by 50-percent below 2006 levels by 2032 and by 80-percent by 2050 (DOEE, 2017).

4.8.2 HOW DOES SI CURRENTLY ADDRESS GHG AND CLIMATE CHANGE CONCERNS?

The Energy Management Team of Smithsonian Facilities has prioritized sustainability goals at SI buildings. The Energy Management Team operates a Sustainable Facilities Working Group (SFWG) to evaluate the feasibility of LEED® certification for Smithsonian buildings. Smithsonian Facilities also tracks utility usage data and implements various BMPs to reduce fossil fuel emissions from SI buildings (SI, 2017).

In 2014, SI performed an energy analysis and determined the CO₂ emissions for each of the buildings on the South Mall Campus. The findings are detailed below in Table 4-2.

Table 4- 2. Carbon Dioxide Emissions for Buildings within the South Mall Campus

Building	Emissions Metric Tons of CO ₂ (MTCO ₂)
Castle	1,175
AIB	1,713
Quadrangle Building (includes Sackler Gallery and NMAfA)	5,380
Freer Gallery	2,364
Hirshhorn Museum and Sculpture Garden	4,606

Source: (Atelier ten, 2014)

4.8.3 WHAT TYPES OF ENERGY CONSERVATION MEASURES DOES SI CURRENTLY USE ON THE SOUTH MALL CAMPUS?

SI policies regarding sustainability include Smithsonian Directive (SD) 414: SI Energy Management Program and Water Supply Emergency Plan and SD 422: Sustainable Design of Smithsonian Facilities. The Energy Management branch continually tracks utility usage at all SI facilities, reviews capital projects for compliance with SI's sustainability goals, and implements building-level and system wide tools and processes to increase sustainability at existing facilities. This group also manages LEED® certifications for SI and assists facility managers with LEED® documentation. LEED® certification is required for all new construction, and SI is also pursuing LEED® certification for many existing facilities.

Currently, none of the exterior and shell of the buildings on the South Mall Campus are LEED® certified, although the recent renovation of the AIB was designed to LEED® Gold standards.

4.8.4 WOULD THE SOUTH MALL CAMPUS MASTER PLAN IMPACT GREENHOUSE GAS EMISSIONS THEREBY CONTRIBUTING TO CLIMATE CHANGE?

4.8.4.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

The No-Action alternative includes the upkeep and maintenance of the outdated and inefficient mechanical system and continued reliance on the GSA steam and chilled water plant. Under this alternative, and assuming no substantial upgrades or fuel source changes to the GSA plant, the systems would not be upgraded thereby the improvements in emissions achieved by newer more efficient units would be negated. Direct impacts result from indirect CO₂ emissions derived from the purchase of electricity. In the short-term, the CO₂ emission rates would stay at their current rate, 15,238 MTCO₂ (Atelier ten,

2014). Short-term direct impacts to climate change would be negligible due to the minor emissions contributed by SI to the larger atmosphere. Under the No-Action Alternative, the buildings would not be renovated to achieve LEED® status; therefore, the benefits achieved in energy and water use reduction would not be achieved. In the long-term as building systems continue to age the amount of energy needed to power the facilities could increase resulting in an increase in CO₂ emissions. Assuming no major changes to the GSA plant, the potential increase in emissions would result in a direct, negligible, long-term, adverse impact to GHG emissions.

INDIRECT IMPACTS

The demand for energy from existing inefficient mechanical systems and older buildings would generate emissions and would result in short-and long-term, indirect, negligible adverse impacts to climate change.

4.8.4.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

Construction equipment used for construction, demolition, excavation, and renovation activities would emit CO₂. These emissions would have short-term, minor, adverse impacts to GHG levels.

All Master Plan Alternatives include upgrading current mechanical systems to more energy efficient units. Proposed system upgrades include shifting from steam and chilled water provided by GSA's Central Heating Plant to an on-site central utility plant powered by natural gas. Improved systems and sustainable building design would allow SI to reduce the amount of energy needed to be purchased from the local energy grid. The proposed central utility plant would emit NO_x; however, it would operate using new energy efficient equipment, emissions controls, and natural gas which would have lower emissions. This shift is predicted to result in a 39 percent CO₂ reduction (Atelier ten, 2014). Ongoing maintenance would be necessary to promote efficient and clean operation of the mechanical system. Efficiency measures promoted by SI to

reduce energy consumption such as motion sensitive, high efficiency lights would increase the efficiency and lower energy demands.

The improvements to mechanical equipment and the use of a natural-gas powered central utility plant would result in long-term direct impacts to GHG that are beneficial but negligible.

INDIRECT IMPACTS

The improvements to mechanical equipment and the use of a natural-gas powered central utility plant would reduce the overall CO₂ contribution of the South Mall Campus resulting in long-term, beneficial but negligible, indirect impacts to climate change.

4.8.4.3 ALTERNATIVE B

DIRECT IMPACTS

Alternative B includes the elements common to all Master Plan Alternatives. In addition, this alternative includes a consolidated delivery area. Organizing and centralizing deliveries would reduce the amount of time that trucks are idling, thereby reducing their emissions.

Under Alternative B, buildings would be renovated with the goal of achieving LEED® Gold Certification. GHGs come from many components of the built environment, including building systems and energy use, transportation, water use and treatment, land-cover change, materials, and construction (Huynh, 2017). Improving the efficiency of buildings can reduce greenhouse gas emissions. LEED®-certified buildings are more resource efficient and therefore use less water and energy ultimately reducing GHG emissions. Even with the implementation of these measures the short- and long-term direct impacts are beneficial but negligible. The reduction in energy consumption, water use and waste production would result in long-term, minor, beneficial impacts to GHG emissions.

INDIRECT IMPACTS

The improvements to mechanical equipment and the use of a natural-gas powered central utility plant would reduce the overall CO₂ contribution of the South Mall Campus resulting in long-term, beneficial but negligible, direct impacts to climate change.

4.8.4.4 ALTERNATIVE D

Under Alternative D, the direct impacts to GHG emissions would be the same as those under Alternative B.

INDIRECT IMPACTS

Under Alternative D, the indirect impacts to climate change would be the same as those under Alternative B.

4.8.4.5 ALTERNATIVE F

DIRECT IMPACTS

Under Alternative F, the direct impacts to GHG emissions would be the same as those under Alternative B.

INDIRECT IMPACTS

Under Alternative F, the indirect impacts to climate change would be the same as those under Alternative B.

4.9 CULTURAL RESOURCES

In accordance with Section 106 of the National Historic Preservation Act (NHPA), NCPC, as the lead federal agency, is required to consider the effects of the proposed action on historic properties. Pursuant to Public Law 108-72 Stat. 888 (August 15, 2003), for projects in the District of Columbia that are subject to review and approval by the NCPC, the SI is deemed to be a federal agency for purposes of compliance with Section 106. The SI is the lead agency for Section

106 purposes pursuant to 36 CFR 800.2(a)(2) for the undertaking to fulfill their Section 106 responsibilities. Historic properties, as defined by the implementing regulations of the NHPA, are any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). This term includes artifacts, records, and remains that are related to and located within such properties, as well as properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

To be included in, or found eligible for inclusion in, the NRHP, historic properties must meet one of the following criteria (as defined in CFR 36 § 60.4):

- A) Be associated with events that have made a significant contribution to the broad patterns of our history; or
- B) Be associated with the lives of persons significant in our past; or
- C) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
- D) Have yielded, or are likely to yield, information important in prehistory or history.

Certain types of properties, including those less than 50 years of age, are not usually considered for National Register listing unless they meet special requirements, known as Criteria Considerations. Historic properties must also possess sufficient integrity to convey their significance, including their location, design, setting, materials, workmanship, feeling and association.

NEPA requires federal agencies to consider the degree to which an action "...may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP or may cause loss or destruction of significant

scientific, cultural, or historical resources.” The term “cultural resource” is not specifically defined in NEPA, NHPA, or any other federal law. Generally speaking, however, cultural resources include all resources that have significant cultural associations between the human environment and the natural or built environment. The term cultural resources includes all resources included within the Section 106 definitions of “historic properties”, as well as additional resources such as sacred sites, traditional cultural properties (TCPs), archaeological sites not eligible for listing in the NRHP, archaeological collections, and cultural landscapes. Also included are significant local and state monuments, properties listed in local and state historic registers, and other sites of cultural significance that are not otherwise eligible for National Register listing.

4.9.1 WHAT IS THE AREA OF POTENTIAL EFFECTS?

An early step in the Section 106 process is the determination and documentation of the area of potential effect (APE). As defined by 36 CFR § 800.16 (d), the APE is “the geographic area within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.”

SI and NCPC developed the APE for the proposed action by completing research, site visits, and photographic documentation, and through consultation with the DC HPO and other consulting agencies (Figure 4-9 and Figure 4-10). As the Smithsonian South Mall Campus is situated in a prominent location along the south boundary of the National Mall between 12th and 7th Streets, SW, the APE was delineated to account for the high visibility of the site within the National Mall, its component landscapes, and the surrounding urban context. The APE boundaries reflect the outer limits from which views toward the property may reasonably generate indirect adverse effects.

The APE is irregularly shaped, but is roughly bound by 1st Street, NE/SE to the east and 17th Street, SW to the west. To the north, the APE is primarily bound by Constitution Avenue, NW. The APE's north boundary extends approximately one block north between 9th and 7th streets, before returning to Constitution Avenue. To the south, the APE is bound by: Independence Avenue, SW between 17th and 14th Streets, SW, and 2nd Street, SW, and 1st Street, SE; C Street, SW, between 14th and 12th Streets, SW, and 9th and 2nd Streets, SW; and Maine Avenue, SW, between 12th and 9th Streets, SW.

4.9.2 WHAT IS THE HISTORIC SIGNIFICANCE OF THE SOUTH MALL CAMPUS?

The Smithsonian South Mall Campus is approximately 20 acres of land within Reservations 3 and 4 along the southern side of the National Mall. The South Mall Campus is bound by 7th Street, SW to the east, Independence Avenue, SW to the south, 12th Street, SW to the west, and Jefferson Avenue, SW to the north. A portion of the South Mall Campus extends to the north of Jefferson Avenue, SW around the Hirshhorn Museum Sculpture Garden.

The Smithsonian was among the earliest federal institutions to be established on the National Mall in the mid-19th century. One year after the Smithsonian was established in 1846, Congress granted the southern half of the National Mall between 12th and 9th Streets, SW to the Smithsonian (known as the Smithsonian Grounds). The Smithsonian Institution Building was constructed on the Grounds and opened to the public in 1855.

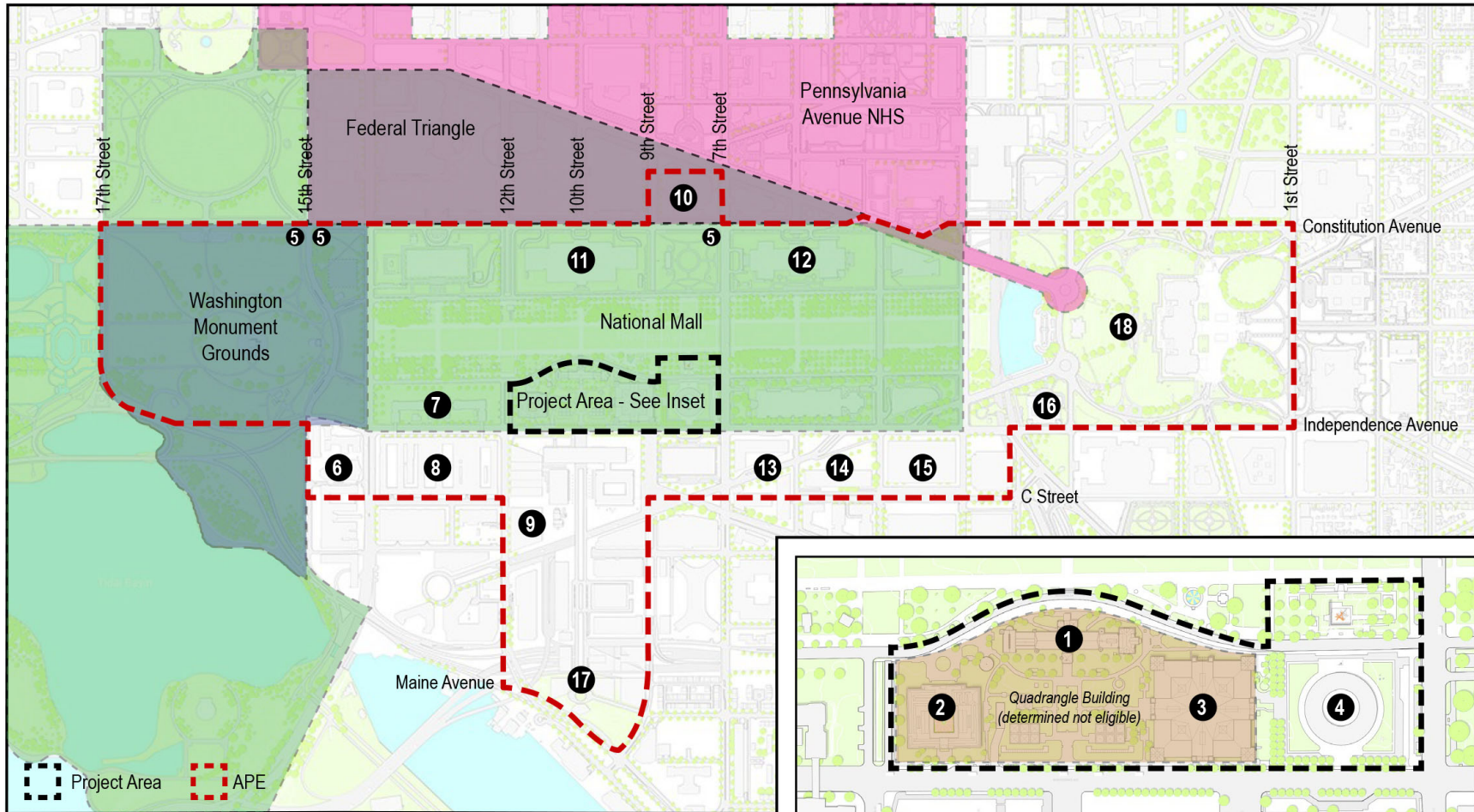


Figure 4-9. Project Area and APE Map (numbered resources are on following page).

Within Project Area		Within Area of Potential Effects (APE)			
	National Mall		Washington Monument Grounds	11	National Museum of Natural History
	Smithsonian Institution Quadrangle		Pennsylvania Avenue NHS	12	National Gallery of Art (West Building)
	Plan of the City of Washington		Federal Triangle Historic District	13	Federal Office Building 10B
1	Smithsonian Institution Building	5	Bulfinch Gatehouses and Gateposts	14	Federal Office Building 6
2	Freer Gallery of Art	6	Auditor's Building Complex	15	Social Security Administration
3	Arts and Industries Building	7	USDA Administration Building	16	United States Botanic Garden
4	Hirshhorn Museum and Sculpture Garden	8	USDA South Building	17	Benjamin Banneker Park
		9	USDA Cotton Annex	18	U.S. Capitol and Grounds
		10	National Archives		

Figure 4-10. List of Historic Properties within Project Area and APE. The list above documents historic district and individual resources that have been listed in or determined eligible for NRHP listing, or that have been listed in the D.C. Inventor.

The South Mall Campus is significant for its representation of broad patterns of development in Washington, DC, particularly the National Mall. The Smithsonian was among the earliest federal institutions to stake a permanent claim on the National Mall in the mid-19th century and the South Mall Campus today represents a continuous pattern of use and development. The buildings and landscapes found throughout the South Mall Campus are representations of the evolving needs and values of a unique national institution of science, history, culture, and the arts dedicated “for the increase and diffusion of knowledge.” The South Mall Campus is also significant for its association with the growth and evolution of the Smithsonian Institution from its establishment in 1846 to the present and for museum collections that embrace non-Western art and culture.

4.9.3 WHAT CULTURAL RESOURCES ARE THERE IN THE SOUTH MALL CAMPUS?

The following cultural resources are located within the South Mall Campus. Unless otherwise cited, resource descriptions were derived from the resource listings in the DC Inventory of Historic Sites (DC SHPO, 2009).

SMITHSONIAN INSTITUTION BUILDING

Location: Jefferson Drive, SW between 9th and 12th Streets, NW.

Designation: DC Inventory of Historic Sites, 1964; National Historic Landmark, 1965; NRHP, 1966; Contributing building to the National Mall Historic District (DC/NRHP); Contributing building to the Smithsonian Institution Quadrangle Historic District (DC)

The Smithsonian Institution Building (the Castle) (Figure 4-11), designed by James Renwick, Jr., is a premier example of Norman Revival-style architecture, a blend of late Romanesque and early Gothic styles, in the United States. Constructed between 1847 and 1855, the building underwent significant repairs in 1865 after a fire destroyed portions of its upper story. Constructed of red sandstone, the building’s towers, buttresses, and crenellations epitomize the Romantic architectural movement. The building originally housed all of the Institution’s operations, including the administrative offices, research rooms,

laboratories, and libraries. Other Renwick buildings include Renwick Gallery (Old Corcoran Gallery) in Washington, DC, and St. Patrick's Cathedral and Grace Church, both located in New York City.

FREER GALLERY OF ART

Location: 12th Street, SW and Jefferson Drive, SW.

Designation: DC Inventory of Historic Sites, 1964; NRHP, 1969; Contributing building to the National Mall Historic District (DC/NRHP); Contributing building to the Smithsonian Institution Quadrangle Historic District (DC)

The Freer Gallery of Art (Figure 4-12) was positioned in accordance with the McMillan Commission's Plan to restore L'Enfant's original vision for the National Mall. Charles Platt designed the building around an open courtyard, referencing a Florentine Renaissance palazzo. Completed in 1923, the gallery was built to house Charles Freer's donated collection of American and Oriental Art. Clad in gray granite, the building features a rusticated ashlar façade and finely detailed balustrade.

ARTS AND INDUSTRIES BUILDING

Location: 900 Jefferson Drive, SW.

Designation: DC Inventory of Historic Sites, 1964; National Historic Landmark and NRHP, 1971; Contributing building to the National Mall Historic District (DC/NRHP); Contributing building to the Smithsonian Institution Quadrangle Historic District (DC)

The AIB (Figure 4-13), originally known as the US National Museum, was constructed to house the international exhibits from the 1876 Philadelphia Centennial Exhibition. Completed between 1879 and 1881, the building is the premier example of 19th-century exposition or "world's fair" architecture in America. The building is also significant for its polychrome brick facades and dynamic roofline.

HIRSHHORN MUSEUM AND SCULPTURE GARDEN

Location: Independence Avenue, SW, between 7th Street, SW, and the 9th Street Expressway.

Designation: Determined Eligible for Individual Listing on the National Register of Historic Places; Contributing building to the National Mall Historic District (DC/NRHP)

The Hirshhorn Museum and Sculpture Garden (Figure 4-14) was designed by Gordon Bunshaft of Skidmore, Owings & Merrill (SOM). Construction of the Modernist style, cylindrical building and its sunken sculpture garden began in 1969, and the museum opened to the public in 1974. The museum houses the collection of Joseph H. Hirshhorn, a self-made millionaire and prolific art collector who formally offered his collection of modern and contemporary art to the United States in 1966. Landscape architect Lester Collins redesigned the sculpture garden in 1977-81.

QUADRANGLE

Location: Within the National Mall bound by the Freer Gallery to the west, the Castle to the north, the AIB to the east, and Independence Avenue, SW to the south.

Designation: Contributing building to the Smithsonian Institution Quadrangle Historic District (DC); Contributing building to the National Mall Historic District (NRHP/DC)

The Quadrangle Building is comprised of a multi-level, below-grade structure with three aboveground entrance pavilions located within the Enid A. Haupt Garden (Figure 4-15). The Haupt Garden sits on the roof of the Quadrangle Building. The Postmodern style structure was designed by Shepley, Bulfinch, Richardson and Abbott (Jean Paul Carlhian, Design Principal) following a conceptual design by Japanese architect Junzo Yoshimura, with Sasaki Associates serving as landscape architect. The Quadrangle Building was constructed between 1983 and 1987 and houses the S. Dillon Ripley Center, Sackler Gallery, and the NMAfA (Robinson & Associates, 2016). The Haupt Garden was a collaborative design effort by Carlhian, Sasaki Associates, Lester Collins, and the SI Office of Horticulture.



Figure 4-11. Smithsonian Institution Building, south (rear) elevation.



Figure 4-12. Freer Gallery, north elevation, facing south.



Figure 4-13. Arts and Industries Building, west elevation, facing southeast.



Figure 4-14. Hirshhorn Museum, north elevation, facing south.

SMITHSONIAN INSTITUTION QUADRANGLE HISTORIC DISTRICT

Location: Bound by Jefferson Drive, SW, on the north, the axis of 12th Street, SW, on the west, Independence Avenue, SW, on the south, and the axis 9th Street, SW, on the east.

Designation: DC Inventory of Historic Sites, 2017

The Smithsonian Institution Quadrangle Historic District has four contributing resources: Smithsonian Institution Building, Arts and Industries Building, Freer Gallery, and the Quadrangle Building, the major elements of which are the Arthur M. Sackler Gallery (Figure 4-16), NMAfA, (Figure 4-17) and S. Dillon Ripley Center (and their entrance pavilions) (Figure 4-18), the Enid A. Haupt Garden, and the sandstone structures that provide emergency egress, skylights, air intake, and ventilation for the below ground galleries.

All of the above individual resources (except for the Smithsonian Institution Quadrangle Historic District), as well as the Downing Urn (Figure 4-19), and the Joseph Henry Statue (Figure 4-20), are also contributing objects to the National Mall Historic District.



Figure 4-15. View of the Enid A. Haupt Garden and Smithsonian Institution Building, within the Smithsonian Institution Quadrangle Historic District.



Figure 4-16. Arthur M. Sackler Gallery, facing west.



Figure 4-17. National Museum of African Art, facing northeast.



Figure 4-18. Ripley Center Pavilion, facing east.



Figure 4- 19. Downing Urn.



Figure 4- 20. Joseph Henry Statue, facing south.

NATIONAL MALL HISTORIC DISTRICT

Location: Bound by 3rd Street, SW; Independence Avenue, SW; Raoul Wallenberg Place, SW; a CSX Railroad; the Potomac River; Constitution Avenue, NW; 17th Street, NW; the White House Grounds; and 15th Street, NW.

Designation: DC Inventory of Historic Sites, 1964; NRHP, 1966 (amendment and boundary expansion, 2016)

The National Mall Historic District (Figure 4-21) includes much of the monumental core of Washington, DC, an original design element of Major General Pierre Charles L'Enfant's plan for the Capital City that was further refined and expanded in the McMillan Commission's 1901-1902 plan for the City of Washington. L'Enfant designed the National Mall to serve as the central axis of Washington's monumental core. The plan called for the National Mall to be a 400-foot-wide, mile long, "grand avenue" from the Capitol to a point directly south of the President's house. The site was to be lined with landscaped areas and gardens. The 1901 McMillan Commission restored and supplemented the L'Enfant Plan primarily by removing obtrusive elements and bordering the National Mall with public buildings.

The National Mall Historic District has 110 contributing resources, including 17 buildings, 24 sites, 38 structures, and 31 objects. The resources within the bounds of the project area—including the Smithsonian Institution Building, the Freer Gallery of Art, the Arts and Industries Building, the Hirshhorn Museum and Sculpture Garden, the Quadrangle Building, the Downing Urn, the Joseph Henry Statue, and Jefferson Drive—are contributing resources to the historic district. Additionally, the National Mall Cultural Landscape, which is roughly bound by Constitution Avenue to the north, Jefferson Drive to the south, 14th Street to the west, and 3rd Street to the east, is located within the National Mall Historic District and forms the central unifying element of the district (NPS 2006).

THE PLAN OF THE CITY OF WASHINGTON

Location: Portions of the plan that fall within the APE include Constitution Avenue, NW, Pennsylvania Avenue, NW, Madison Drive, NW, Jefferson Drive, SW, Independence Avenue, SW, Maryland Avenue, SW, D Street, SW, Frontage Road, SW, 15th Street, SW, 14th Street, NW, 12th Street, SW, 9th Street, NW, 7th Street, NW, 4th Street, SW, and 3rd Street, NW.

Designation: DC Inventory of Historic Sites, 1964 (Major elements, 1971; expansion, 1997); NRHP, 1997

In 1790, the passage of Residence Act provided for the establishment of a permanent seat of government for the United States. The act authorized the selection of a site on the Potomac River and stipulated that suitable accommodations be constructed to house Congress, the President, and other public offices before it officially became the nation's capital in 1800. The chosen site was located at the confluence of the Potomac River and its Eastern Branch (now the Anacostia River), covering a ten-mile-square district bridging portions of Maryland and Virginia. In 1791, George Washington invited Major General Pierre Charles L'Enfant, a French émigré and architect, to design a plan for the City of Washington (the central area of the District of Columbia). L'Enfant's plan was inspired by European Baroque precedents defined by avenues, radiating diagonally from fifteen public squares and circles, overlaid with an irregularly spaced grid. A central feature of the plan was the "Grand Avenue, 400 feet [121.9 meters] in breadth and about a mile in length, bordered with gardens, ending in a slope from the houses on each side." The Grand Avenue formed a major east-west axis between the Capitol Building ("Congress House") and a planned equestrian statue of Washington (L'Enfant, 1887). The McMillan Commission included Daniel Burham, Frederick Law Olmsted, and Charles McKim, whose plan improved the urban environment, restored and reestablished L'Enfant's plan for the monumental core of the Capital and Mall, and created a comprehensive park system.

The Plan of the City of Washington (Figure 4-22) is comprised of contributing streets and avenues, parks and public reservations, and views and vistas. The following contributing elements to the Plan of the City of Washington are located within or directly adjacent to the South Mall Campus:

- National Mall/Part of Original Appropriation No. 2
- Independence Avenue
- Jefferson Drive
- 7th Street, SW
- 12th Street, SW
- Frontal Vista of Smithsonian Institution Building “Castle” from Tenth Street, SW (NPS, 2001)



Figure 4-21. National Mall from 3rd Street, SW facing west. EHT Traceries.



Figure 4-22. Detail, L'Enfant Plan Facsimile, 1887. Library of Congress.

What is a Cultural Landscape?

The National Park Service defines a **Cultural Landscape** as a geographic area, including both cultural and natural resources, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. There are four general types of cultural landscapes: historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes.

A site's identification as a cultural landscape confers no official historic designation. Cultural landscapes fall within the umbrella of "cultural resources" for NEPA purposes.

4.9.4 WHAT CULTURAL LANDSCAPES ARE THERE IN THE SOUTH MALL CAMPUS?

In 2015, SI completed a Cultural Landscape Report (CLR) for the South Mall Campus. The CLR documented the South Mall Campus as a single cultural landscape, with a history and character that reflected the growth and development of the Smithsonian Institution between the mid-19th and late-20th centuries. Additionally, the report identified several component landscapes located within of the South Mall Campus. These landscapes are located in the National Mall Historic District, but are not listed as contributing sites. Additionally, the Haupt Garden is located in the Smithsonian Quadrangle Historic District (DC Inventory of Historic Sites), but it was not identified as a contributing site to that historic district. These component landscapes have no additional historic designation. Nevertheless, they contribute to the visual and landscape character of the South Mall Campus Cultural Landscape.

FOLGER ROSE GARDEN

Location: Bound by the Castle, AIB, and Jefferson Drive, SW

The Smithsonian Institution installed the current configuration of the Folger Rose Garden in 1998 (Figure 4-23). Beginning in the 1940s, the small triangular plaza hosted a series of planting schemes, and by the 1970s, the plaza was the site of the Andrew Jackson Downing urn. The 1998 garden design was composed of four at-grade planting beds with granite curbs encircling a 19th-century fountain placed in a new, granite basin. Brick-paved walkways cut through the site, connecting the central fountain to the surrounding sidewalks. Horticulturally, the garden was primarily devoted to the display of roses, although it also featured evergreen shrubs and perennials, allowing for a year-round display of color. The garden was dedicated in October 1998, named in honor of Kathrine Dulin Folger. In 2016, Smithsonian Gardens completed a comprehensive replanting of the Folger Garden (EHT Tracerics, 2015).

RIPLEY GARDEN

Location: Bound by the AIB, Hirshhorn Museum Plaza, Independence Avenue, SW, and Jefferson Drive, SW.

Mary Livingston Ripley, wife of Secretary S. Dillon Ripley (1964-1984), first recognized the potential for the creation of a “Sensory Garden” in the underused plaza between the Arts and Industries Building and the Hirshhorn Museum and Sculpture Garden. After the tunneling of 9th Street was completed in 1971, the space was used as a storage yard for the rehabilitation of the Arts and Industries Building. In 1978, Smithsonian commissioned architectural firm Hugh Newell Jacobsen and Associates to prepare the architectural plans for the garden. Jacobsen’s design for the garden featured a linear path that extended from Independence Avenue to Jefferson Drive. The meandering brick walkway was bordered by serpentine brick retaining walls that contained planting beds (Figure 4-24). The Smithsonian Office of Horticulture oversaw the selection of plants, intended to stimulate the senses of touch, taste, sight, hearing, and especially smell through colorful and aromatic plants and herbs, textured hardscape, and a large fountain. The Sensory Garden opened to the public in 1981. In 1988, it was rededicated as the Mary Livingston Ripley Garden (EHT Traceries, 2015).

ENID A. HAUPT GARDEN

Location: Approximately bound by the Castle, AIB, Freer Gallery, and Independence Avenue, SW.

Developed between 1983 and 1987, the Smithsonian Quadrangle Building and Enid A. Haupt Garden were constructed in the parcel bound by the Castle, Freer Gallery, AIB, and Independence Avenue. Formerly known as the South Yard, this area had long served utilitarian uses for the Smithsonian Institution. It housed an assemblage of buildings and uses, including an astronomical observatory, a stable and carriage house, a taxidermy studio, and—briefly—enclosures for animals in the collection of the National Zoo. In the 1970s, SI rehabilitated a

portion of the South Yard to install a period garden designed in the Victorian style.

Completed in May 1987, the 4.2-acre Enid A. Haupt Garden sits atop the roof of the primarily below-ground Quadrangle Building museum and education complex. Designed by Jean-Paul Carlhian of the architectural firm Shepley Bulfinch Richardson and Abbott with landscape architects Sasaki Associates, in consultation with landscape architect Lester Collins and the Smithsonian Office of Horticulture, the Haupt Garden formed a vibrant and intimate setting for the Quad (see Figure 4-25). Funded by and named for philanthropist Enid A. Haupt, the garden design borrowed a number of elements from earlier iterations of the landscape, such as a central parterre from the Victorian Garden and sandstone gates inspired by James Renwick. (The gates were constructed and installed in 1987.) It also integrated contemporary interpretations of traditional ethnic landscapes that reflected the collections of the museums below (EHT Traceries, 2015).



Figure 4-23. *Folger Rose Garden, facing west, Smithsonian Garden. EHT Traceries.*



Figure 4-24. *Ripley Garden, facing southeast. EHT Traceries.*



Figure 4-25. *Ripley Garden, facing southeast. EHT Traceries.*

4.9.5 WHAT OTHER CULTURAL RESOURCES ARE THERE IN THE AREA OF POTENTIAL EFFECTS?

The following cultural resources are located outside of the South Mall Campus Plan project area but fall within the Area of Potential Effects.

WASHINGTON MONUMENT AND GROUNDS

Location: 14th Street, NW, between Constitution Avenue, NW and Independence Avenue, SW
Designation: DC Inventory of Historic Sites, 1964; NRHP, 1966 (amendment, 2016)

The Washington Monument and Grounds (Figure 4-26), Original Appropriation No. 3, Reservation 2, is located at the juncture of the National Mall, extending west from the Capitol, and President's Park, extending south from the White House. Contributing resources to the Monument and its Grounds include the Washington Monument, Survey Lodge, Memorial Lodge, Jefferson Pier Marker, Sylvan Theater, an encirclement of American flags, a parking lot, and various paths (NPS, 1981). The equestrian statue envisioned by L'Enfant as the western terminus of the great axis from the Capitol was never built; instead, the obelisk designed by Robert Mills was constructed over an extended period from 1848 to 1884. The McMillan Commission's plans for a formal, geometric garden to improve the grounds were never implemented.

PENNSYLVANIA AVENUE NATIONAL HISTORIC SITE

Location: Roughly bound by 3rd Street, NW, on the east, Constitution Avenue, NW on the south, East Executive Avenue, NW on the west, and E and F Streets, NW on the north
Designation: National Historic Site and NRHP, 1966 (NR listing amended in 2007); DC Inventory of Historic Sites, 1973

Pennsylvania Avenue National Historic Site (Figure 4-27) is comprised of the national ceremonial route and its surroundings which lie between the White House and the Capitol. Originally designed as part of L'Enfant's 1791 plan for the Capitol City, the historic thoroughfare has served as the site of inaugural parades and civic processions. The commercial heart of the city, the area



Figure 4- 26. Washington Monument and grounds.

contains both monumental civic buildings and smaller commercial structures. Approximately 161 features are within the bounds of the site, 111 of which are contributing resources. The site's historic and architectural significance includes its streets, vistas, buildings, memorials, parks, and sculptures (NPS 2007).

FEDERAL TRIANGLE HISTORIC DISTRICT

Location: Between 15th Street, NW and Constitution and Pennsylvania Avenues, NW.

Designation: DC Inventory of Historic Sites, 1968; Determined Eligible for Listing on the NRHP;

Located within the Pennsylvania Avenue National Historic Site

Federal Triangle (Figure 4-28) is comprised of a unified group of federal, neoclassical-style office buildings that were constructed as a result of the passage of the Public Buildings Act in 1926. Design guidelines for the site were developed by U.S. Secretary of the Treasury Andrew W. Mellon and a Board of Architectural Consultants, led by Edward H. Bennett of the Chicago architectural firm of Bennett, Parsons, and Frost. Mellon wanted the Neoclassical buildings to share certain architectural elements including limestone facades, red tiled roofs, and classical colonnades. Each member of the Board designed one building within the complex, including: Commerce Building (1927-1932) by York and Sawyer; Post Office Department (1931-1934) by Delano and Aldrich; Labor Department, Interstate Commerce Commission, and Departmental Auditorium (1931-1935) by Arthur Brown; Internal Revenue Service (1927-1935) Louis Simon; Justice Department (1931-1935) by Zantzinger, Borie and Medary; National Archives (1931-1937) by John Russell Pope; and Federal Trade Commission (1937-1938) by Bennett, Parsons and Frost. Two earlier buildings, Old Post Office (1891-1899) by Willoughby J. Edbrooke and the District Building (1904-1908) by Cope and Stewardson, are also located within the Federal Triangle Historic District (NPS, 1968).

BULFINCH GATEHOUSES AND GATEPOSTS

Location: Constitution Avenue, SW at 7th, 15th, and 17th Streets, NW.

Designation: DC Inventory of Historic Sites, 1964; NRHP, 1973

The former gate structures of the Capitol, constructed of Aquia Creek sandstone at the foot of the Capitol grounds between 1824 and 1829, were part of the reconstruction of the Capitol after the War of 1812. They are attributed to Charles Bulfinch, the architect in charge of the restoration. The gatehouses and posts were removed in 1874, reconstructed at their present locations circa 1880, and were restored circa 1938 (Figure 4-29). The two one-room gatehouses of rusticated sandstone were designed to harmonize with the U.S. Capitol's basement story. Their design is of a classical style with Doric columns and arched doorways. The four remaining sandstone gateposts are similar, topped with acanthus motifs and volutes.



Figure 4-27. *Pennsylvania Avenue, at its intersection with 14th Street, SW looking southeast, EHT Traceries.*



Figure 4-28. *The Andrew W. Mellon Auditorium at Federal Triangle from Constitution Avenue, NW, looking north.*



Figure 4-29. *Bulfinch gatepost at the corner of 15th Street, SW and Constitution Avenue, looking south. EHT Traceries.*

4.9.6 HOW ARE IMPACTS TO CULTURAL RESOURCES EVALUATED?

Direct and Indirect Impacts on cultural resources in this section would be evaluated within the framework provided at the beginning of this chapter. Potential impacts are described in terms of intensity, type, duration, and context. Additionally, the thresholds for the intensity of impacts are defined as negligible, minor, moderate, and major.

Additional criteria for the evaluation of impacts on cultural resources is provided by NHPA Section 106 implementing regulations (36 CFR § 800). Effects are evaluated as “adverse” or “not adverse.” The criteria of adverse effect are defined as follows:

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative (36 CFR 800.5(a)(1).

Examples of adverse effects may include: physical destruction or damage; alterations that are inconsistent with the Secretary’s Standards for the Treatment of Historic Properties, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access; removal of the property from its historic location; change of the character of the property’s use or of contributing physical features within the property’s setting; introduction of visual, atmospheric, or audible elements that diminish the property’s integrity of the property’s significant historic features;

neglect or deterioration (except in certain religious or cultural cases); and transfer, lease, or sale of property out of federal ownership or control without adequate preservation controls.

In some cases, insufficient information is available to definitively evaluate the impacts of a proposed action on cultural resources at the master planning level. These impacts would be reevaluated when individual projects are brought forward for design and implementation. A Programmatic Agreement would outline a process for identifying and evaluating effects on historic properties at the implementation.

For the purposes of this analysis, a minor, moderate, or major adverse impact is equated with an adverse effect. A negligible adverse impact does not rise to the level of intensity to constitute an adverse effect for the purposes of Section 106. The discussion of impacts for cultural resources has been arranged in a table format, organized by resource, and with a description of the proposed action and associated impacts.

4.9.7 HOW WOULD THE SOUTH MALL CAMPUS MASTER PLAN IMPACT CULTURAL RESOURCES ON THE SOUTH MALL CAMPUS?

4.9.7.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

Under the No-Action Alternative, SI would not undertake any major activities that would involve construction, demolition, or excavation. Minor repairs to the Quadrangle Building roof membrane, existing building utilities, and other building facades could cause temporary, short-term, minor adverse impacts to cultural resources in the South Mall Campus. Minor repairs and renovations, with associated construction disturbance and staging, would negatively impact the character and setting of these resources.

The No-Action Alternative would not result in necessary comprehensive repairs to the Smithsonian Institution Building “Castle”; the Quadrangle Building; or the Hirshhorn Museum Building, Plaza, and Sculpture Garden. The lack of a coordinated approach to stabilizing, repairing, and protecting these resources would make them vulnerable to continued deterioration or future seismic or blast events. This lack of necessary repairs would result in a long-term, moderate, adverse impact to these resources.

INDIRECT IMPACTS

There would be no indirect impacts to cultural resources under the No-Action Alternative.

4.9.7.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

Table 4-3 describes the elements and associated direct impacts that are common to all Master Plan Alternatives. These represent long-term impacts. In all cases, the construction disturbance and staging associated with each action would create short-term adverse impacts on the character and setting of these resources.

Table 4-3. Elements and Associated Direct Impacts Common to All Master Plan Alternatives

Resource	Action	Impacts
Freer Gallery of Art	Freer Gallery East Accessible Entrance: An existing window on the east side of the Freer Gallery would be lowered to create an accessible entrance from Haupt Garden.	Alteration of the east wall would create a long-term, minor adverse impact to the historic window configuration. Minor adverse impact has been further minimized by designing the new entrance to correspond to the existing facade bay configuration and to remove a minimal amount of historic fabric. Interior lobby would be located in a modified area and would not affect significant historic interior spaces.

Resource	Action	Impacts
	New Loading Ramp: A new loading ramp would be constructed on the west lawn of the Freer Gallery to connect with centralized loading facilities.	Ramp and associated infrastructure has potential to adversely impact the character and setting of the Freer Gallery. Excavation may require structural underpinning to Freer Gallery. Impacts would be further evaluated at time of project design.
The Castle	Castle Blast Protection: Castle retrofit would include blast resistance to be coordinated with perimeter security elements.	Blast protection would include hardening and replacement of non-original components, including windows. Blast protection is consistent with Security Design Criteria for SI Facilities. No adverse impacts would result. This action would protect the Castle from potential blast events, resulting in a beneficial long-term impact.
	Castle Base Isolation: Base isolation would include excavation beneath the Castle and introduction of base isolators beneath the existing foundation.	Base isolation would be designed and monitored to ensure protection of Castle. Consistent with best practices for base isolation, SI would solicit third-party review by qualified engineers to ensure protection of Castle. No adverse impacts would result. This action would protect the Castle from potential seismic events, resulting in a beneficial long-term impact. Base isolation requires a neutral perimeter around base of the Castle. Perimeter buffer would be integrated into the landscape and would not result in long-term adverse impacts.
	Castle Seismic Bracing: Structural bracing would be added to supplement the Castle's existing structure.	Structural bracing would be limited to building interior and would not be visible from the exterior. Bracing would not adversely or visually impact significant historic interior spaces. Non-significant interior spaces may be impacted by the addition of structural bracing. Effects would be further evaluated at time of project design. This action would protect the Castle from potential seismic events, resulting in a beneficial long-term impact.
	Castle Basement Floor Lowering: In connection with seismic retrofit, the basement floor level would be lowered to create additional headroom for the Visitor Center and other program uses.	Undertaking would remove incompatible infill construction and allow for the restoration of historic masonry vaults, piers, and walls. Detailing of historic structural elements would be designed to meet the Secretary of the Interior Standards. The beneficial impact of removing non-original infill construction would be offset by the adverse impact of altering the proportions of basement spaces and the potential loss of historic fabric. The net impact would result in a minor, long-term, adverse impact on the character and integrity of the Castle.

Resource	Action	Impacts
	Castle Interior Restoration: The ground and upper floors of the Castle would be rehabilitated, with significant interior spaces restored to their period(s) of significance.	Undertaking would remove incompatible infill construction and would be designed to meet the Secretary of the Interior Standards. This action would restore the character of these spaces, resulting in a beneficial long-term impact.
AIB	Reopen AIB for Public Circulation: The non-historic east security door would be removed and AIB would be opened to allow interior east-west circulation.	Returning the east door to use would not adversely impact the character or integrity of AIB. Removing the non-historic security door would allow the extant door (a restored version of the original door) to be visible, resulting in a beneficial long-term impact.
	Remove Surface Parking Lot and Expand Ripley Garden: The non-historic parking lot to the east of AIB would be removed, allowing for the expansion of the adjacent Ripley Garden.	Removing the parking lot and expanding the existing garden would create a minor, beneficial, long-term impact to the character and setting of AIB.
	Central Utility Plant: Unexcavated areas adjacent to the Quad would be excavated to create a central utility plant for the South Mall Campus.	The location and extent of excavation varies by alternative. Excavation may require structural underpinning to be performed on west side of AIB foundations. Impacts would be further evaluated at time of project design. Excavation would be monitored to ensure safety of AIB during implementation.
Hirshhorn Museum and Sculpture Garden	Hirshhorn Building Renovation: Hirshhorn Building and Plaza would be renovated.	Action would be designed to meet the Secretary of the Interior Standards. This action would preserve the character of this resource, resulting in a beneficial long-term impact.
	Hirshhorn Sculpture Garden Walls: Perimeter sculpture garden walls would be repaired in kind.	Repairs to walls are necessary to prevent further deterioration of their condition and appearance. This action would preserve the character of this resource, resulting in a beneficial long-term impact.
National Mall Historic District	Replace Quadrangle Building Roof Membrane: Quadrangle Building roof membrane would be replaced.	Replacement of the roof membrane would not adversely impact the contributing Quad building. The associated treatment of the above-ground Quad pavilions and Haupt Garden would be addressed separately by alternative.
	Perimeter Security: Perimeter security elements would be installed around the South Mall Campus.	Perimeter security has the potential to adversely impact the character of the National Mall, including the relationship of buildings to the surrounding landscapes. Perimeter security elements would be integrated into hardened landscape features to the greatest degree possible, and will be designed in such a way as to minimize their visual impact to the National Mall. Impacts would be further evaluated at time of project design.

Resource	Action	Impacts
	All Plan Components: Implementation of the Master Plan Alternatives may necessitate the removal of existing Mall vegetation to allow for construction access, staging, and excavation.	Removal of contributing Mall vegetation, especially the significant Mall elm trees, will have an adverse impact on the Mall cultural landscape. The degree of impact will vary depending on the nature and extent of plant material to be removed. In all cases, this impact will be mitigated by limiting the extent of the work and specifying replacement plantings of an appropriate species, size, and maturity.
Smithsonian Quadrangle Historic District	The Freer Gallery, Smithsonian Institution Building, Arts and Industries Building, and Quadrangle Building are contributing buildings to the Smithsonian Quadrangle Historic District. These buildings also all contribute to the National Mall Historic District. All direct impacts described above for the National Mall Historic District and its contributing buildings also apply to the Smithsonian Quadrangle Historic District.	The Freer Gallery, Smithsonian Institution Building, Arts and Industries Building, and Quadrangle Building are contributing buildings to the Smithsonian Quadrangle Historic District. These buildings also all contribute to the National Mall Historic District. All direct impacts described above for the National Mall Historic District and its contributing buildings also apply to the Smithsonian Quadrangle Historic District.
L'Enfant Plan	All Plan Components: The Master Plan Alternatives propose no major alterations to contributing streets and avenues within the project area.	Adverse impacts have been avoided by removing alterations to Jefferson Drive, SW and Independence Avenue, SW from all Alternatives.
South Mall Campus Cultural Landscape	Replace Quadrangle Building Roof Membrane: Quadrangle Building roof membrane beneath the Haupt Garden would be replaced.	Replacement of the roof membrane would generate major, temporary adverse impacts for the Haupt Garden component landscape. The associated permanent treatment of the above-ground Quad pavilions and Haupt Garden would be addressed separately by alternative.

INDIRECT IMPACTS

There would not be indirect impacts to cultural resources in the South Mall Campus common to all Master Plan Alternatives.

4.9.7.3 ALTERNATIVE B

DIRECT IMPACTS

Alternative B includes the elements common to all Master Plan Alternatives. Table 4-4 describes the actions and associated long-term, direct impacts that additionally apply to Alternative B. In all cases, the construction disturbance and staging associated with each action would create negative short-term impacts on the character and setting of these resources.

Table 4-4. Elements and Associated Direct Impacts – Alternative B

Resource	Action	Impacts
The Castle	Consolidated Loading Facility: A partial new sub-basement would be excavated beneath the existing basement to provide loading and building support.	Sub-basement excavation is limited to the east and west Castle ranges and wings. Excavation would be monitored to ensure safety of building during implementation. Impacts would be further evaluated at time of project design.
	Visitor Center Entrance: Removal of the Ripley Pavilion may require a new entrance adjacent to Castle.	New Visitor Center entrance has potential to adversely impact character and setting of Castle. Impacts would be further evaluated at time of project design.
Hirshhorn Museum and Sculpture Garden	Hirshhorn Plaza Walls: Portions of the plaza walls would be removed to allow a direct pedestrian connection to AIB and the Ripley Garden.	Small opening would be inserted on the west plaza wall. Action would create a long-term, minor adverse impact to the integrity of this resource.
	Hirshhorn Tunnel: A direct connection between the Hirshhorn Plaza and Sculpture Garden beneath Jefferson Drive would be restored.	The existing tunnel would be reopened and restored to its original configuration. This represents a beneficial, long-term impact to the character of this resource.
National Mall Historic District	Reconfigure Haupt Garden: In coordination with roof membrane replacement, the Haupt Garden would be reconfigured to accommodate new Quad museum and Visitor Center access.	Haupt Garden features would be substantially replaced in kind following roof membrane replacement. A long-term, minor, adverse impact would result.
	Central Utility Plant: Unexcavated areas adjacent to the Quad would be excavated to create a central utility plant for the South Mall Campus.	In Alternative B, the plant would be located in the unexcavated area between the Quad and AIB. Excavation would require structural underpinning. Exhaust and intake vents would be integrated into the Haupt Garden landscape with potential for adverse impacts. Impacts would be evaluated at time of project design.
	Quad Museum Pavilions: Museum entrances would be reoriented to existing openings in the north walls of the museum pavilions.	This action would not negatively impact the character of this resource.
Smithsonian Quadrangle Historic District	The Freer Gallery, Smithsonian Institution Building, Arts and Industries Building, and Quadrangle Building are contributing buildings to the Smithsonian Quadrangle Historic District. These buildings also all contribute to the National Mall Historic District. All direct impacts described above for the National Mall Historic District and its contributing buildings also apply to the Smithsonian Quadrangle Historic District.	
South Mall Campus Cultural Landscape	Reconfigure Haupt Garden: In coordination with roof membrane replacement, the Haupt Garden would be reconfigured to accommodate new Quad museum and Visitor Center access.	Haupt Garden features would be substantially replaced in kind following roof membrane replacement. A long-term, minor, adverse impact would result.

INDIRECT IMPACTS

There would not be indirect impacts to cultural resources in the South Mall Campus under Alternative B.

4.9.7.4 ALTERNATIVE D

DIRECT IMPACTS

Alternative D includes the elements common to all Master Plan Alternatives. Table 4-5 describes the actions and associated direct impacts that additionally apply to Alternative D. These represent long-term impacts. In all cases, the construction disturbance and staging associated with each action would create negative, short-term impacts on the character and setting of these resources.

Table 4-5. Elements and Associated Direct Impacts – Alternative D

Resource	Action	Impacts
The Castle	Castle Sub-Basement Expansion: A new sub-basement would be excavated beneath the existing basement level. Sub-basement would provide loading, utility, and building support.	Sub-basement excavation would include entire Castle footprint and would require extensive structural bracing. Bracing would create a long-term, moderate, adverse impact on the character and integrity of the Castle.
	Visitor Center Entrance: A new means of entrance and egress from the below-grade Visitor Center is proposed in Alternative D. The entrance would face the Quadrangle Building below grade in a “dip” configuration, allowing for direct access and daylight to the Visitor Center.	Below-grade “dip” entrance to Visitor Center would diminish the historical setting and character of Castle and would result in a long-term, major, adverse impact.
Hirshhorn Museum and Sculpture Garden	Hirshhorn Plaza Walls: Large portions of the north, west, and east plaza walls would be removed.	Removing large portions of the Hirshhorn Plaza walls would create a long-term, major, adverse impact on a contributing feature of this resource.
	Hirshhorn Tunnel: The existing tunnel between the Hirshhorn Plaza and sculpture garden beneath Jefferson Drive would be reopened, expanded, and reconfigured to create a new pedestrian connection.	The reconfiguration of a contributing feature of this resource would create a long-term, major, adverse impact on this resource.
	New Galleries Beneath Sculpture Garden: In Alternative D, the interior walls of the Sculpture Garden would be reconfigured to allow for high-ceilinged galleries below.	Existing Sculpture Garden elements would be removed and replaced with an elevated sculpture garden and high-ceilinged galleries below. The new Sculpture Garden floor would be set below the prevailing grade, and would maintain a recessed relationship to the National Mall. This would result in a long-term, major, adverse impact on the Hirshhorn Museum Sculpture Garden. This would also result in a long-term, major, adverse impact to the

Resource	Action	Impacts
		National Mall Historic District, as the Hirshhorn Museum Sculpture Garden is a contributing element to the historic district.
National Mall Historic District	Reconfigure Haupt Garden: In coordination with roof membrane replacement, the Haupt Garden would be reconfigured to accommodate new Quad museum and Visitor Center access.	Haupt Garden would be substantially reconfigured. Removal of Haupt Garden features would adversely affect character and integrity of the contributing Quad building and would result in a long-term, major, adverse impact.
	Central Utility Plant: Unexcavated areas adjacent to the Quad would be excavated to create a central utility plant for the South Mall Campus.	In Alternative D, the plant would be located in the sub-basement beneath the Castle. Excavation may require structural underpinning. Exhaust and intake vents would be integrated into the Haupt Garden landscape with potential for adverse impacts. Impacts would be evaluated at time of project design.
	Quad Museum Pavilions: Existing museum pavilions would be removed and replaced with new pavilions further to the north.	Removal of the pavilions would adversely affect character and integrity of the contributing Quad building and would result in a long-term, major, adverse impact.
	Quad Skylights: In Alternatives D, the existing skylights would be removed and new expanded skylights would be integrated into the Haupt Garden design to provide interior daylighting for the Quad museums and Visitor Center south of the Castle.	Removal and replacement of existing features and integration of new skylights would result in a loss of integrity and setting of the contributing Quad building. This would generate a long-term, moderate, adverse impact on the resource. Impacts would be further evaluated at time of project design.
Smithsonian Quadrangle Historic District	The Freer Gallery, Smithsonian Institution Building, Arts and Industries Building, and Quadrangle Building are contributing buildings to the Smithsonian Quadrangle Historic District. These buildings also all contribute to the National Mall Historic District. All direct impacts described above for the National Mall Historic District and its contributing buildings also apply to the Smithsonian Quadrangle Historic District.	
South Mall Campus Cultural Landscape	Reconfigure Haupt Garden: In coordination with roof membrane replacement, the Haupt Garden would be reconfigured to accommodate new Quad museum and Visitor Center access.	Haupt Garden would be substantially reconfigured. Removal of Haupt Garden features would adversely affect character and integrity of this cultural landscape and would result in a long-term, major, adverse impact.

INDIRECT IMPACTS

There would not be indirect impacts to cultural resources in the South Mall Campus under Alternative D.

4.9.7.5 ALTERNATIVE F

DIRECT IMPACTS

Alternative F includes the elements common to all Master Plan Alternatives. Table 4-6 describes the actions and associated direct impacts that additionally apply to Alternative F. These represent long-term impacts. In some cases, the adverse impacts described in Alternative D have been minimized or avoided in Alternative F. These changes are reflected in Alternative F and are described individually by action in the Table 4-6.

In all cases, the construction disturbance and staging associated with each action would create short-term, negative impacts on the character and setting of these resources.

Table 4-6. Elements and Associated Direct Impacts – Alternative F

Resource	Action	Impacts
The Castle	Castle Sub-Basement Expansion: A new sub-basement would be excavated beneath the existing basement level. Sub-basement would provide loading, utility, and building support.	Sub-basement excavation is limited to the west range and wing. Excavation would be monitored to ensure safety of building during implementation. Impacts would be further evaluated at time of project design.
	Visitor Center Entrance: A new means of entrance and egress from the below-grade Visitor Center is proposed in Alternative F. Visitor Center entrance would be provided in below-grade court located to the south of the Castle.	In Alternative F, the adverse impact of a visible grade change has been avoided by reducing the size of the entrance and limiting its visibility from the south. The entrance, in addition to the Quad skylights, has the potential to adversely impact the character and setting of the Castle. Impacts would be further evaluated at time of project design.
Hirshhorn Museum and Sculpture Garden	Hirshhorn Plaza Walls: Portions of the plaza walls would be removed to allow a direct pedestrian connection to AIB and the Ripley Garden.	Small opening would be inserted on the west plaza wall. Action would create a long-term, minor adverse impact to the integrity of this resource.
	Hirshhorn Tunnel: The existing tunnel between the Hirshhorn Plaza and Sculpture Garden beneath Jefferson Drive would be reopened, expanded, and reconfigured to create a new pedestrian connection.	The reconfiguration of a contributing feature of this resource would create a long-term, major, adverse impact on this resource.
	New Galleries Beneath Sculpture Garden: In Alternative F, the interior walls of the sculpture garden would be reconfigured to allow for high-ceilinged galleries below.	Existing Sculpture Garden elements would be removed and replaced with an elevated Sculpture Garden and high-ceilinged galleries below. The new Sculpture Garden floor would be set below the prevailing grade and would maintain a recessed relationship to the National Mall. This would result in a long-term, major, adverse impact on the Hirshhorn Museum Sculpture Garden.
National Mall Historic District	Reconfigure Haupt Garden: In coordination with roof membrane replacement, the Haupt Garden would be reconfigured to accommodate new Quad museum and Visitor Center access.	Haupt Garden would be reconfigured. Removal of Haupt Garden features would adversely affect character and integrity of the contributing Quad building and would result in a long-term, moderate, adverse impact. Adverse impact has been minimized in Alternative F by retaining the garden-like quality of the existing Haupt Garden and repurposing existing features in the garden.
	Central Utility Plant: Unexcavated areas adjacent to the Quad would be excavated to create a central utility plant for the South Mall Campus.	In Alternative F, the plant would be located in the unexcavated area between the Quad and AIB. Excavation would require structural underpinning. Exhaust and intake vents would be integrated into the Haupt Garden landscape with potential for long-term, minor, adverse impacts. Impacts would be evaluated at time of project design.

Resource	Action	Impacts
	Quad Museum Pavilions: Existing museum pavilions would be removed and replaced with new pavilions further to the north.	Removal of the pavilions would adversely affect character and integrity of the contributing Quad building and would result in a long-term, major, adverse impact.
	Quad Skylights: In Alternative F, the existing skylights would be removed and new, expanded daylighting would be integrated into the Haupt Garden design to provide interior daylighting for the Quadrangle Building museums and Visitor Center south of the Castle.	Removal of existing features and integration of new skylights would result in a loss of integrity of the contributing Quad building. This would generate a long-term, moderate, adverse impact on the resource. Impacts would be further evaluated at time of project design.
Smithsonian Quadrangle Historic District	The Freer Gallery, Smithsonian Institution Building, Arts and Industries Building, and Quadrangle Building are contributing buildings to the Smithsonian Quadrangle Historic District. These buildings also all contribute to the National Mall Historic District. All direct impacts described above for the National Mall Historic District and its contributing buildings also apply to the Smithsonian Quadrangle Historic District.	
South Mall Campus Cultural Landscape	Reconfigure Haupt Garden: In coordination with roof membrane replacement, the Haupt Garden would be reconfigured to accommodate new Quad museum and Visitor Center access.	Haupt Garden would be reconfigured. Removal of Haupt Garden features would adversely affect character and integrity of this cultural landscape and would result in a long-term, moderate, adverse impact. Adverse impact has been minimized in Alternative F by retaining the garden-like quality of the existing Haupt Garden. Adverse impact has been minimized in Alternative F by retaining the garden-like quality of the existing Haupt Garden and repurposing existing features in the garden.

INDIRECT IMPACTS

There would not be indirect impacts to cultural resources in the South Mall Campus under Alternative F.

4.9.8 HOW WOULD THE SOUTH MALL CAMPUS MASTER PLAN IMPACT OFF-CAMPUS CULTURAL RESOURCES ON THE SOUTH MALL CAMPUS?

This section describes impacts to cultural resources within the Area of Potential Effects, but outside the South Mall Campus project area. None of the actions proposed has the potential to directly impact these cultural resources. Indirect impacts include visual, atmospheric, or audible elements that diminish the integrity of a property's significant historic features.

4.9.8.1 NO-ACTION ALTERNATIVE**DIRECT IMPACTS**

There would be no direct impacts to off-campus cultural resources from the No-Action Alternative.

INDIRECT IMPACTS

Under the No-Action Alternative, SI would not undertake any major activities that would involve construction, demolition, or excavation. Minor repairs to the Quadrangle Building roof membrane, existing building utilities, and other building facades would cause negligible short-term adverse impacts to off-campus cultural resources in the APE. No long-term adverse impacts would result.

4.9.8.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES**DIRECT IMPACTS**

There would be no direct impacts to off-campus cultural resources from elements common to all Master Plan Alternatives.

INDIRECT IMPACTS

Table 4-7 below describes the actions and associated long-term, indirect impacts that are common to all Master Plan Alternatives. In all cases, the construction disturbance and staging associated with each action would create a negligible indirect impact on these resources.

Table 4-7. Elements and Associated Indirect Impacts – Elements Common to All Master Plan Alternatives

Resource	Action	Impacts
National Mall Historic District	New Loading Ramp: The existing loading dock and ramp in the Haupt Garden would be removed and a new loading ramp would be constructed on the west lawn of the Freer Gallery to connect with centralized loading facilities.	The new loading dock would be only minimally visible from the central Mall greensward and would create a negligible adverse impact.

4.9.8.3 ALTERNATIVE B

DIRECT IMPACTS

There would be no direct impacts to off-campus cultural resources from Alternative B.

INDIRECT IMPACTS

Impacts to off-campus cultural resources under Alternative B would be similar to those occurring from elements common to all Master Plan Alternatives. Alternative B proposes no additional major above-grade changes that would add to those impacts discussed above.

4.9.8.4 ALTERNATIVE D

DIRECT IMPACTS

There would be no direct impacts to off-campus cultural resources from Alternative D.

INDIRECT IMPACTS

Indirect impacts to cultural resources under Alternative D would be similar to those occurring from elements common to all Master Plan Alternatives. Table 4-8 describes the actions and associated long-term, indirect impacts that additionally apply to Alternative D.

Table 4-8. Elements and Associated Indirect Impacts – Alternative D

Resource	Action	Impacts
National Mall Historic District	Grade Changes Across Project Area: Alternative D proposes grade changes across the project area, specifically the changes to elevation of the Hirshhorn Sculpture Garden.	Modifications to existing grades throughout the South Mall Campus have the potential to impact contributing Mall viewsheds, specifically the principal E-W viewshed, the vista along 8 th Street NW-SW, and views to the elms and the buildings along the Mall from its walks and central grass panels, as identified in the National Mall Cultural Landscape Inventory and National Register Amendment." Modifications to the Hirshhorn Museum Sculpture Garden, including changing the elevation of the garden floor and potential replanting of Mall elm trees, will have the potential to adversely impact these views. These impacts will be further evaluated at the time of project design.
L'Enfant Plan	Changes to Quadrangle Building pavilions: Alternative D proposes the removal of existing museum pavilions and new museum pavilions adjacent to the Castle, including a below-grade Visitor Center entrance.	The proposed changes have the potential to impede, and therefore negatively impact, the contributing Tenth Street vista to the Castle. These impacts will be further evaluated at the time of project design.

4.9.8.5 ALTERNATIVE F

DIRECT IMPACTS

There would be no direct impacts to off-campus cultural resources from Alternative F.

INDIRECT IMPACTS

Indirect impacts to cultural resources under Alternative F would be similar to those occurring from elements common to all Master Plan Alternatives. .

Table 4-9 describes the actions and associated long-term, indirect impacts that additionally apply to Alternative F.

Table 4-9. Elements and Associated Indirect Impacts – Alternative F

Resource	Action	Impacts
National Mall Historic District	Grade Changes Across Project Area: Alternative F proposes grade changes across the project area, specifically the changes to elevation of the Hirshhorn Sculpture Garden.	Modifications to existing grades throughout the South Mall Campus have the potential to impact contributing Mall viewsheds, specifically the principal E-W viewshed, the vista along 8 th Street NW-SW, and views to the elms and the buildings along the Mall from its walks and central grass panels, as identified in the National Mall Cultural Landscape Inventory and National Register Amendment." Modifications to the Hirshhorn Museum Sculpture Garden, including changing the elevation of the garden floor and potential replanting of Mall elm trees, will have the potential to adversely impact these views. These impacts will be further evaluated at the time of project design.
L'Enfant Plan	Changes to Quadrangle Building pavilions: Alternative F proposes the removal of existing museum pavilions and new museum pavilions adjacent to the Castle, including a below-grade Visitor Center entrance.	The proposed changes have the potential to impede, and therefore negatively impact, the contributing Tenth Street vista to the Castle. These impacts will be further evaluated at the time of project design.

4.9.9 WHAT MEASURES WOULD BE TAKEN TO MINIMIZE IMPACTS TO CULTURAL RESOURCES ON AND OFF THE SOUTH MALL CAMPUS?

In order to reduce adverse impacts on cultural resources, SI would continue to consult with NCPC, NPS, ACHP, DCSHPO, and the Consulting Parties through the Section 106 consultation process to minimize or avoid adverse impacts. The Section 106 resolution document would outline a process for identifying, avoiding, and minimizing adverse impacts on cultural resources for those components of the Master Plan that cannot be fully evaluated at this time. Examples of protection and minimization measures typically taken when working on historic properties include, but are not limited to: stabilization and monitoring during construction; having qualified staff overseeing all work; completing research and documentation which may take the form of Historic Structure Reports (HSRs) or condition assessment reports to support and inform preservation treatments; and applying The Secretary of the Interior's Standards for the Treatment of Historic Properties when developing designs. Where adverse impacts cannot be avoided or minimized, SI would identify mitigation

strategies to provide a related preservation benefit that is comparable with the scale of the undertaking and the degree of impact.

4.10 VISUAL QUALITY

The visual quality of the site and surrounding area were evaluated in several ways. A number of visits were made to the site during various times of the year including spring, summer, and fall. During these visits, photography was used to document the site and the surrounding area, including views and viewsheds. This information was supplemented by historic research, which further informed this evaluation by identifying the historic importance of visual resources, views, and vistas. A change to the site's visual quality is constituted as a permanent alteration that directly or indirectly effects either the views and/or visual resources within or in the vicinity of the project area. Changes to the site's visual quality are important because they may impact the site's integrity of setting.

4.10.1 WHAT ARE THE VISUAL (AESTHETIC) CHARACTERISTICS OF THE SOUTH MALL CAMPUS AND SURROUNDING AREA?

The South Mall Campus is located on the south side of the National Mall, just to the east of the USDA Administration Building and to the west of the National Air and Space Museum. The site contains five Smithsonian Institution buildings, several gardens, lawns, walkways, small-scale features, and a staff parking lot and loading area. The site is relatively flat from several vantage points. Street parking is available during different times of the day on Jefferson Drive, SW, Independence Avenue, SW, and 7th Street, SW. Parking and vehicular traffic, including traffic on 12th Street, SW, are visible from most areas of the South Mall Campus.

The spatial organization of the South Mall Campus is informed by its relationship to the National Mall and the major roadways that encircle the

Campus. The major buildings throughout the Campus provide both enclosure and orientation. This enclosure contributes to a sense of seclusion within the Campus' various gardens, particularly within the Haupt and Ripley gardens and in the Hirshhorn Plaza and Sculpture Garden. In general, the buildings of the Campus are arrayed east-west with major north and south points of entry. There is little east-west continuity between the buildings or across the South Mall Campus in general.

The individual landscape areas within the South Mall Campus are self-contained with limited views and vistas both inward and outward. This condition is largely the product of the scale of the buildings and walls within the South Mall Campus, as well as the size and maturity of the vegetation. Major views include views to and from the Hirshhorn Plaza from the 8th Street, SW axis (north), reciprocal views between the northern edge of the South Mall Campus and the National Mall, reciprocal views between the southern edge of the South Mall Campus and Independence Avenue, and those to and from the Castle along the 10th Street, SW axis (north and south). The landscape surrounding the Freer Gallery has a greater degree of exposure than that of the Hirshhorn, extending some distance along the National Mall, 12th Street, SW, and Independence Avenue, SW. The 10th Street, SW promenade was an important element of the mid-20th century urban renewal plan for the Southwest Quadrant of the District, and was meant to serve as "grand parkway entrance connecting the Southwest with the rest of Washington, DC" (Russello Ammon, 2004).

Construction of Federal Office Building No. 5 (James Forrestal Building) in 1969, however, partially obstructed the intended view from the Smithsonian Grounds to the promenade's southern terminus at Benjamin Banneker Park. The SW Ecodistrict Plan prepared by NCPC proposed the removal of the Forrestal Building and proposed the strengthening of the 10th Street axis through roadway improvements, plantings, and fortifying the street wall along the promenade.

4.10.2 HOW WOULD THE SOUTH MALL CAMPUS MASTER PLAN IMPACT THE VISUAL QUALITY OF THE SOUTH MALL CAMPUS AND SURROUNDING AREA?

4.10.2.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

Under the No-Action Alternative, no major above-grade changes would occur and there would be no permanent changes to views or visual resources within or in the vicinity of the project area (see Figures 4-30 to 4-33). Minor repairs to the Quadrangle Building roof membrane, existing building utilities, and other building facades could cause short-term adverse impacts to visual resources due to construction disturbance, staging, and equipment. These activities are temporary and would result in a long-term, negligible, adverse impact on visual resources.

INDIRECT IMPACTS

There would be no indirect impacts to visual resources under the No-Action Alternative.



Figure 4- 30. Current view of Hirshhorn Plaza Walls looking toward the AIB.



Figure 4-31. Current view of Castle, Haupt Garden, and Freer facing east.



Figure 4- 32. Current view of South Mall Campus facing north.



Figure 4- 33. Current view of Haupt Garden facing northwest.

4.10.2.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

Under all Master Plan Alternatives, permanent alterations to building exteriors and landscapes on the South Mall Campus have the potential to impact visual resources both inside and outside the project area. These actions are described separately below.

In all the Master Plan Alternatives, the common interventions proposed for the Freer Gallery, the Hirshhorn Museum, and Sculpture Garden, and the AIB have a long-term, negligible adverse impact to visual resources. These alterations would result in a minimal change to the visual quality of these buildings and their immediate surroundings.

The alterations proposed for the Castle Building are greater in intensity and include a comprehensive building rehabilitation; seismic and blast upgrade; basement and sub-basement expansion; and a Visitor Center addition, including the addition of egress and ingress facilities to the immediate south of the Castle. Changes proposed to the Castle Building itself have a long-term, negligible, adverse impact to visual resources on the South Mall Campus. However, the addition of a new Visitor Center entrance to the south of the Castle has the potential to impede northerly views along 10th Street, SW to the Castle, creating a minor, long-term, adverse impact. The specific intervention varies by alternative.

Similarly, the greater degree of intervention proposed in all Master Plan Alternatives for the Quadrangle Building and Haupt Garden have a greater potential to adversely impact visual resources. Replacement of the Quadrangle Building roof membrane and Haupt Garden planting would alter the aesthetic character of this landscape, although the resulting impacts would be dependent on the final Haupt Garden design and the configuration and maturity of the new vegetation. The removal of the Ripley Pavilion would restore the historic

reciprocal views between the South Yard and National Mall, resulting in a minor, long-term, beneficial impact.

All Master Plan Alternatives propose the implementation of perimeter security elements, which have the potential to impede or alter visual relationships, especially between the South Mall Campus and the greater National Mall landscape and urban context. To mitigate the impact of the perimeter security design, the elements would be integrated into existing structures and hardened landscape features wherever possible. Implementation of perimeter security would protect and preserve buildings in the event of a blast occurrence resulting in a moderate, beneficial, long-term, impact.

In all Master Plan Alternatives, construction activities would cause short-term adverse impacts to visual resources due to construction disturbance, staging, excavation, construction fencing, and equipment. These activities are temporary and would result in a negligible adverse impact on visual resources.

INDIRECT IMPACTS

There would be no indirect impacts to visual resources. The changes proposed have no potential to indirectly impact significant aesthetic characteristics that contribute to the Plan of the City of Washington, the National Mall, the Washington Monument Grounds, or other resources.

4.10.2.3 ALTERNATIVE B

DIRECT IMPACTS

Alternative B includes the elements common to all Master Plan Alternatives. In addition to the impacts of the common actions, interventions proposed under Alternative B have the potential to impact visual resources in the South Mall Campus (see Figures 4-34 to 3-37).

The insertion of a small opening in the side of the Hirshhorn Plaza would have a minor, long-term, adverse impact to the integrity of the resource and will effect the visual character of this space. The restoration of the Hirshhorn Tunnel will have a beneficial long-term impact to the character of the resource and the spaces' visual character.

The reconfiguration of the Haupt Garden—including the in-kind replacement of planting and the addition of exhaust and intake vents supporting the Central Utility Plant—have the potential to create a minor to moderate, long-term, adverse impact on the aesthetic character of this landscape.

INDIRECT IMPACTS

Alternative B primarily entails minor alterations to existing buildings, minor interventions in existing landscapes, and in-kind replacement of existing garden and hardscape features. Therefore, the changes proposed under Alternative B would be minimally perceptible from surrounding vantage points, and would have no potential indirect impacts to visual resources. The changes proposed have no potential to indirectly impact significant aesthetic characteristics that contribute to the Plan of the City of Washington, the National Mall, the Washington Monument Grounds, or other resources.



Figure 4-34. View of Hirshhorn Plaza Walls looking toward the AIB under Alternative B.



Figure 4-35. View of Castle, Haupt Garden, and Freer facing east under Alternative B.



Figure 4- 36. View of South Mall Campus, facing north under Alternative B.



Figure 4- 37. View of Haupt Garden facing northwest under Alternative B.

4.10.2.4 ALTERNATIVE D

DIRECT IMPACTS

Alternative D includes the elements common to all Master Plan Alternatives. In addition to the impacts of the common elements, interventions proposed under Alternative D have the potential to impact visual resources in the South Mall Campus (see Figures 4-38 to 4-41).

The below-grade “dip” entrance to the Castle Visitor Center would alter the aesthetic character of the Haupt Garden as well as the north-facing viewshed toward the Castle from 10th Street, SW, resulting in a major, long-term, adverse impact to these visual resources. Additionally, the more extensive reconfiguration of the Quadrangle Building and Haupt Garden—including the replacement of the museum pavilions and skylights in new locations—carries both beneficial and adverse effects. The visual quality of the South Mall Campus would benefit by improving the visibility of the museum pavilions from the National Mall, in addition to expanding the viewshed from 10th Street, SW and along Independence Avenue. Conversely, this change has the potential to alter the secluded and intimate character of the Haupt Garden as compared to its environs, resulting in a moderate, long-term, adverse impact.

The reconfiguration of the Haupt Garden—including the in-kind replacement of planting and the addition of exhaust and intake vents supporting the Central Utility Plant—have the potential to create a minor to moderate, long-term, adverse impact on the aesthetic character of this landscape. This impact would be mitigated by limiting the number and size of new exhaust and intake vents in the landscape. SI would explore opportunities to utilize existing Castle towers and chimneys to provide exhaust, thereby minimizing the number of structures in the landscape at grade.

Alternative D also proposes a greater degree of change to the Hirshhorn Museum, specifically the plaza and Sculpture Garden. Removal of large portions

of the plaza walls would diminish the quality of the plaza as a self-contained space, improving views but also diminishing its aesthetic character, resulting in a net adverse impact. Raising the Sculpture Garden to allow for high-ceilinged galleries below would alter the intimate nature of the existing Sculpture Garden landscape and has the potential to impede the north-west view along the 8th Street axis, resulting in a long-term, moderate, adverse impact.

INDIRECT IMPACTS

Changes proposed to the Hirshhorn Sculpture Garden under Alternative D have the potential to indirectly impact the principal, east-west National Mall viewshed. Although the changes proposed would not impede on the central greensward, the changes may alter extant landscape features, including mature trees, which would result in a minor, long-term, adverse impact to the continuity of that visual resource. Replanting the four rows of elm trees in this area would mitigate this impact on the National Mall.

Otherwise, there would be no indirect impacts to visual resources under Alternative D. The changes proposed have no potential to indirectly impact significant aesthetic characteristics that contribute to the Plan of the City of Washington, the Washington Monument Grounds, or other resources.



Figure 4- 38. View of Hirshhorn Plaza Walls looking toward the AIB under Alternative D.



Figure 4- 39. View of Castle, Haupt Garden, and Freer facing east under Alternative D.



Figure 4- 40. View of South Mall Campus facing north under Alternative D.

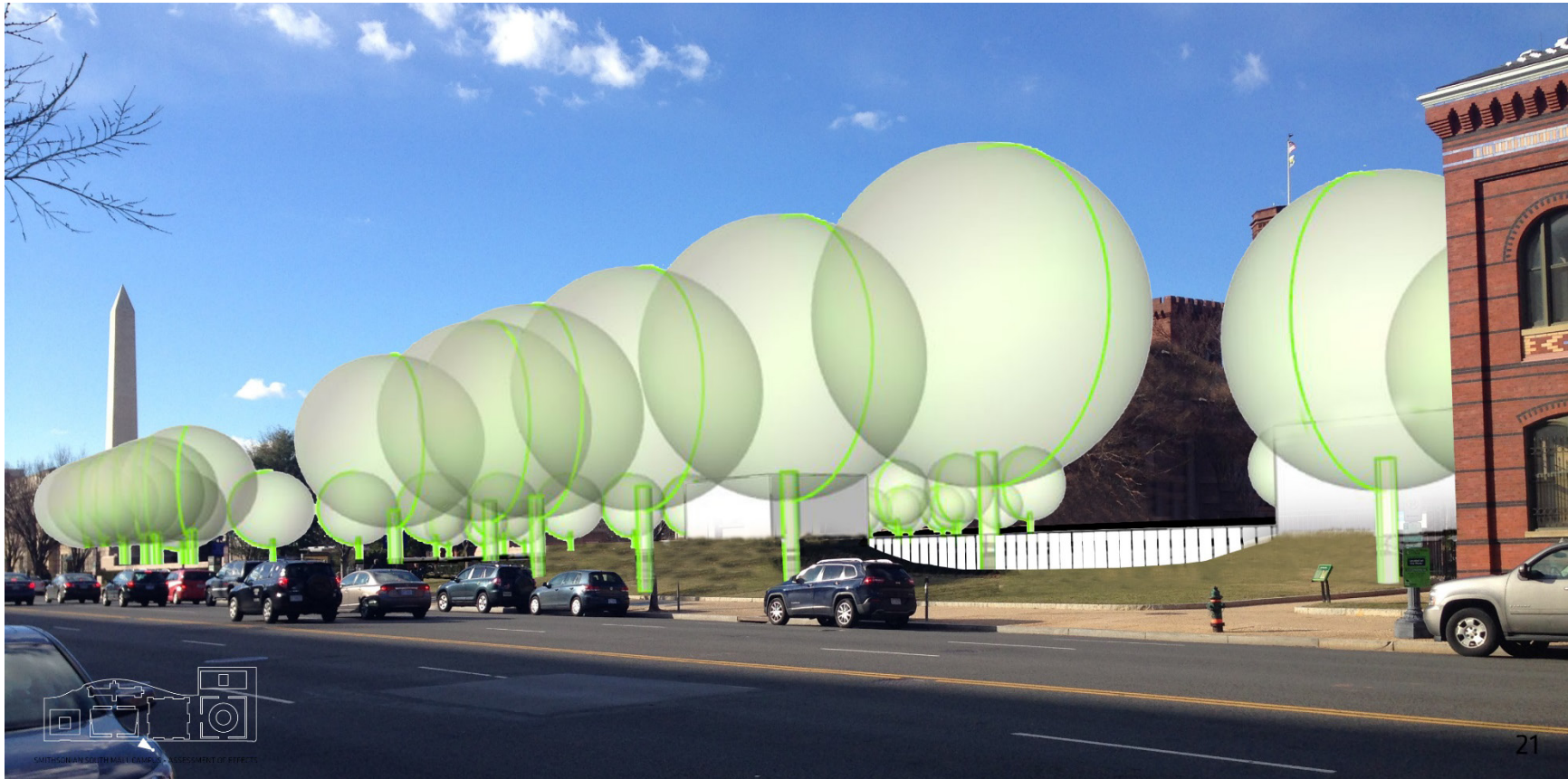


Figure 4- 41. View of Haupt Garden facing northwest under Alternative D.

4.10.2.5 ALTERNATIVE F

Alternative F includes the elements common to all Master Plan Alternatives. In addition to the impacts of the common actions, interventions proposed under Alternative F have the potential to impact visual resources in the South Mall Campus (see Figure 4-42 to Figure 4-45).

The below-grade channel entrance to the Castle Visitor Center would alter the aesthetic character of the Haupt Garden as well as the north-facing viewshed toward the Castle from 10th Street, SW, resulting in a moderate, long-term, adverse impact to these visual resources. Additionally, the more extensive reconfiguration of the Quadrangle Building and Haupt Garden—including the replacement of the museum pavilions and skylights in new locations—carries both beneficial and adverse effects. The visual quality of the South Mall Campus would benefit by improving the visibility of the museum pavilions from the National Mall, in addition to expanding the viewshed from 10th Street, SW and along Independence Avenue creating a minor beneficial impact. Conversely, this change has the potential to alter the secluded and intimate character of the Haupt Garden as compared to its environs, resulting in a moderate, long-term, adverse impact. This impact has been minimized in Alternative F by retaining the garden-like quality and certain features of the existing Haupt Garden, which would result in a similar aesthetic character as exists today.

However, the reconfiguration of the Haupt Garden—including the in-kind replacement of planting and the addition of exhaust and intake vents supporting the Central Utility Plant—has the potential to create a minor to moderate, long-term, adverse impact on the aesthetic character of this landscape. This impact would be mitigated by limiting the number and size of new exhaust and intake vents in the landscape. SI would also explore opportunities to utilize existing Castle towers and chimneys to provide exhaust, thereby minimizing the number of structures in the landscape at grade.

Alternative F also proposes a greater degree of change to the Hirshhorn Museum, specifically the Sculpture Garden. Raising the Sculpture Garden to allow for high-ceilinged galleries below would alter the intimate nature of the existing Sculpture Garden landscape and has the potential to impede the north-south view along the 8th Street axis, resulting in a long-term, moderate, adverse impact. In Alternative F, the treatment of the plaza walls would be undertaken in a similar manner to Alternative B, resulting in the same long-term, minor adverse impact.

INDIRECT IMPACTS

Changes proposed to the Hirshhorn Sculpture Garden under Alternative F have the potential to indirectly impact the principal, east-west National Mall viewshed. Although the changes proposed would not impede on the central greensward, the changes may alter extant landscape features, including mature trees, which would result in a minor, long-term, adverse impact to the continuity of that visual resource. Replanting the four rows of elm trees in this area would mitigate this impact on the National Mall.

Otherwise, there would be no indirect impacts to visual resources under Alternative F. The changes proposed have no potential to indirectly impact significant aesthetic characteristics that contribute to the Plan of the City of Washington, the Washington Monument Grounds, or other resources.



Figure 4- 42. View of Hirshhorn Plaza Walls looking toward the AIB under Alternative F.



Figure 4- 43. View of Castle, Haupt Garden, and Freer facing east under Alternative F.



Figure 4- 44. View of South Mall Campus facing north under Alternative F.



Figure 4- 45. View of Haupt Garden facing northwest under Alternative F.

4.10.3 WHAT MEASURES WOULD BE TAKEN TO MINIMIZE IMPACTS TO AREA AESTHETICS AND VISUAL RESOURCES?

Impacts to visual resources resulting from the Master Plan Alternatives would be minimized through sensitive, context-aware designs that reference and are compatible with existing features. Any above-grade structures and landscape features proposed for the South Mall Campus would be limited in their size and placement in order to preserve and enhance existing views and viewsheds. For any changes where replanting of existing vegetation is necessary, such as in the Haupt Garden, Smithsonian would endeavor to specify appropriately mature replacements to shorten or minimize the temporary effects of construction. Where possible, infrastructure elements—such as the new loading dock ramp, perimeter security features, and central utility plant ventilation—would be integrated into landscape features to create a cohesive, aesthetically compatible design. Further measures to minimize impacts to visual would be identified at the time individual projects are brought forward for design.

4.11 LAND USE PLANNING AND POLICIES

4.11.1 WHAT ARE THE LOCAL AND FEDERAL PLANNING AND ZONING ORDINANCES?

Since the South Mall Campus is federally-owned, it is not subject to District zoning requirements, plans, or DCRA building permits. In developing alternatives for the South Mall Campus Master Plan, SI consulted with the DC Office of Planning and considered the connections between the South Mall Campus and the active, growing city in which it is located. SI does obtain District permits related to stormwater, curb cuts, and work in DC public space.

COMPREHENSIVE PLAN FOR THE NATIONAL CAPITAL

Development within the District of Columbia is guided by The Comprehensive Plan for the National Capital, which includes goals, objectives, and planning policies to direct and manage growth. This plan contains both Federal Elements

and District of Columbia Elements. Although the Smithsonian is not an executive branch agency, it is an instrument of the United States and because it is located within the monumental core of the city, SI and the South Mall Campus are guided by the Federal Elements of the Comprehensive Plan.

The Federal Elements, prepared by NCPC and revised in 2016, provide a policy framework for the federal government in managing its operations and activity in the National Capital Region. The Federal Elements primarily address issues related to federal property and interests in the National Capital Region. Federal elements include: Urban Design, Federal Workplace, Foreign Missions and International Organizations, Transportation, Federal Environment, Historic Preservation, Visitors and Commemoration, and Parks and Open Space (NCPC, 2016).

The Urban Design element regulates the historic and character-defining resources of the District as the Nation's Capital, as well as the center of the federal government. This element has many aspects in common with the Monumental Core Framework Plan, which identifies new sites for memorials and museums, eliminates physical barriers between sites, promotes diverse land uses that support day and night activities, and designing for a more pedestrian-friendly experience at the street level. According to the Urban Design element, development along the National Mall should be carefully planned to preserve historic open space and monumental character, but should also support public space programs and connections between sites.

In addition to the Comprehensive Plan, the South Mall Campus is situated between two major planning areas: The SW Ecodistrict to the south, and the National Mall to the north.

SW ECODISTRICT PLAN

The area immediately south of the South Mall Campus across Independence Avenue, SW is the subject of the SW Ecodistrict Plan, prepared by NCPC in 2013,

which recommends extending the civic qualities of the National Mall to the waterfront (NCPC, 2013). The SW Ecodistrict would connect Banneker Park to the National Mall with a green thoroughfare along 10th Street, SW. This plan proposes to transform the Maryland Avenue, SW and 10th Street, SW area into a highly sustainable mixed-use community. Along with planned waterfront redevelopment, this would create new places to live, develop new cultural destinations, and promote a vibrant walkable neighborhood to the south of the South Mall Campus. Independence Avenue, SW and the South Mall Campus are viewed as a transition area between the open space of the National Mall and the urban character of the SW Ecodistrict. In support of this concept of transition, the SW Ecodistrict Plan proposes to redevelop most of the buildings along the south side of Independence Avenue, with careful attention to building massing, roofline sculpting, and materials. The plan calls for up to an additional 1.8 million square feet of residential and/or hotel development directly across Independence Avenue, SW from the South Mall Campus. Ultimately the implementation of the SW Ecodistrict Plan would increase area connectivity including to and from the National Mall and the South Mall Campus. The District has also designated the Independence Avenue Sub-Area along the south side of Independence Avenue, SW between 2nd and 12th Streets, SW, which further protects the viewshed of the National Mall.

NATIONAL MALL PLAN

The National Mall Plan, prepared by NPS in 2010, proposes to rehabilitate and refurbish the National Mall to maintain its value as a premier civic and symbolic space (NPS, 2010a). The Plan includes strategies to rehabilitate the historic landscape, including memorials and planned views; maintain and improve the open areas of the National Mall in support of public gatherings, demonstrations, events, and other intense uses; and enhance urban recreation and sustainable urban ecology.

4.11.2 IS THE SOUTH MALL CAMPUS MASTER PLAN CONSISTENT WITH FEDERAL AND LOCAL PLANNING LAND USE PLANS?

4.11.2.1 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no changes to the South Mall Campus layout, wayfinding, pathway configurations, or viewsheds would occur. No improvements to circulation or connectivity within the South Mall Campus or to adjacent areas would occur. There would be no improvement in visual and pedestrian connections to neighboring sites. Therefore, the No-Action Alternative would have no impacts to land use or planning.

4.11.2.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

Due to the long-range scope of planning efforts in the area, the elements common to all Master Plan Alternatives would not have short-term impacts to land use planning.

Under the Action Alternatives, the land use of the South Mall Campus would not change. Under all Master Plan Alternatives, the demolition of the Ripley Center pavilion, the removal of the existing loading ramp next to the Freer Gallery, and the reconfiguration of the Ripley Garden would create more visible and inviting pedestrian connections between the National Mall and the SW Ecodistrict. Perimeter security measures would be designed to blend in with landscape elements throughout the South Mall Campus.

The elements common to all Master Plan Alternatives would be consistent with the goals of the SW Ecodistrict Plan. The replacement and upgrade of mechanical, electrical, water, sanitary, and stormwater infrastructure in all campus buildings and throughout the South Mall Campus, along with construction of a new energy efficient central utility plant, would be consistent with the energy efficiency and sustainability goals of the SW Ecodistrict Plan.

The addition of stormwater best management practices including reinstalling the Haupt Garden that would function as an upgraded green roof above the Quadrangle Building and the addition of pervious pavers, bioretention areas, and additional plantings and green space would be added wherever possible would support the green infrastructure goals of the SW Ecodistrict Plan. Lastly, the improved connections between the South Mall Campus, the National Mall, and the SW Ecodistrict would be consistent with the SW Ecodistrict goals for improved connections to public space.

The elements common to all Master Plan Alternatives include measures to restore and renovate historic buildings consistent with the National Mall Plan's cultural resource goals of improving buildings and architectural features. The elements common to all Master Plan Alternatives also include improvements to stormwater management, utilities, and mechanical systems that will result in decreased water quality impacts and energy usage consistent with the National Mall Plan's goals for natural resources and sustainability. The NPS' National Mall Plan calls for improved visitor facilities and wayfinding including a welcome plaza near the Metro station in front of the Smithsonian Castle to orient visitors to the National Mall and inform them about opportunities. This goal is consistent with the South Mall Campus Master Plans' improved connections between the museums and gardens of the South Mall Campus, the National Mall, and the neighborhood.

The elements common to all Master Plan Alternatives would also be consistent with the guiding principles of the Federal Elements of the *Comprehensive Plan for the National Capital*. The South Mall Campus Master Plan will promote high quality design, a goal of the Comprehensive Plan. Installing perimeter security elements around the entire South Mall Campus while also improving connections between museums, the National Mall, and the surrounding community is consistent with the Comprehensive Plan's goal of balancing accessibility and security. The energy efficient, sustainable, and green

infrastructure features of the South Mall Campus Master Plan are consistent with the Comprehensive Plan's goals to address climate change; and the improved connections between the South Mall Campus, the National Mall, and the SW Ecodistrict are consistent with the Comprehensive Plans goals to support pedestrian-oriented development that adds vitality and visual interest to urban areas.

Therefore, the elements common to all Master Plan Alternatives would have a long-term beneficial impact on land use planning.

INDIRECT IMPACTS

By enhancing walkability, removing physical and visual barriers, and linking the civic qualities of the National Mall to the SW Ecodistrict and the waterfront, the South Mall Campus Master Plan would contribute to the federal and local long-term goals for a welcoming, well-connected, sustainable, and iconic capital city with the National Mall as its centerpiece. The Master Plan combined with other planning efforts in the area would attract more visitors, private developers, and residents over time, contributing to economic growth and vitality in the National Mall area and the District as a whole. Therefore, the elements common to all Master Plan Alternatives would result in a long-term, moderate, beneficial indirect impact to land use planning in the District.

4.11.2.3 ALTERNATIVE B

DIRECT IMPACTS

Alternative B includes the elements common to all Master Plan Alternatives. In addition, the limited changes to the Haupt Garden and building entrances under Alternative B would result in the preservation of historic open space and monumental character. However, Alternative B would also result in the least improvement in visual and pedestrian connections to neighboring sites. Under Alternative B, the pathways in the Haupt Garden would be replaced in their current configuration, which would not improve campus circulation or

wayfinding. The Hirshhorn perimeter walls and the Sackler Gallery and NMAfA pavilions would continue to act as physical and visual barriers between the South Mall Campus, the National Mall, and the SW Ecodistrict. By reorienting the Sackler Gallery and NMAfA pavilion entrances toward the National Mall, Alternative B would slightly improve the visibility of these museums to and from the National Mall compared to the No-Action Alternative, but to a lesser extent than the other Master Plan Alternatives. Overall, due to the limited improvements to visibility and pedestrian connections, Alternative B, when compared to the other Master Plan Alternatives, is the least consistent with the Comprehensive Plan goal of pedestrian-oriented development that adds vitality and visual interest to urban areas and the SW Ecodistrict Plan goals for improved connections to public space. Although Alternative B would have adverse effects on historic properties, the rehabilitation of buildings on the South Mall Campus would be consistent with the Comprehensive Plan's goals for preserving, protecting, and rehabilitating historic properties.

Alternative B would restore and renovate historic buildings and minimize changes to above ground spaces consistent with the National Mall Plan's cultural resource goals of improving buildings and architectural features while protecting and preserving planned vistas and open spaces. Alternative B includes additional program space and visitor amenities which are consistent with the National Mall Plan's goals for the civic stage and portions of the visitor experience. However, visibility of museum entrances and consolidation of amenities would not occur under Alternative B which is not in keeping with the National Mall Plan's goals for improved access and circulation and improved visitor experience.

INDIRECT IMPACTS

The indirect impacts to land use planning under Alternative B would be similar to those discussed under elements common to all Master Plan Alternatives.

4.11.2.4 ALTERNATIVE D

DIRECT IMPACTS

Alternative D includes the elements common to all Master Plan Alternatives. In addition, the grade changes proposed under Alternative D would potentially affect the historic character of the South Mall Campus to a greater degree compared to Alternative B. The “dip” entrance to the proposed below-grade Visitor Center underneath the Castle would alter the relationship between the Castle and the Haupt Garden. However, under Alternative D, the pathways in the Haupt Garden would be reconfigured to improve campus circulation and wayfinding. The Haupt Garden would be expanded and restored, providing more space for programming and special events and adding to the symbolic and functional importance of the South Mall Campus. By removing the Sackler Gallery and NMAfA pavilions and relocating them closer to the National Mall, Alternative D would strengthen museum identities, to reestablish historic views from the National Mall, and open the Haupt Garden up to Independence Avenue and the SW Ecodistrict. The north, east, and west perimeter walls of the Hirshhorn Plaza would be lowered or eliminated, which would improve the visibility, access, and integration of the Hirshhorn Museum to Jefferson Drive, SW and the National Mall. Compared to the other Master Plan Alternatives, Alternative D would eliminate the greatest number of physical and visual barriers between the South Mall Campus, the National Mall, and the SW Ecodistrict promoting the Comprehensive Plan and SW Ecodistrict Plan goals of pedestrian-oriented development and improved connections to public space. Due to the impacts to the historic character of the South Mall Campus, Alternative D is consistent with the SW Ecodistrict Plan, but may not be fully consistent with the Urban Design or Historic Preservation Elements of the Comprehensive Plan.

Alternative D would restore and renovate historic buildings consistent with the National Mall Plan’s cultural resource goals of improving buildings and

architectural features. However, changes to Castle, Haupt Garden, and Quadrangle pavilions would alter the landscape. Alternative D includes additional program space which is consistent with the National Mall Plan's goals for the civic stage. Alternative D also adds and consolidates visitor amenities and improves visibility of museum entrances which are in keeping with the National Mall Plan's goals for improved visitor experience and improved access and circulation.

INDIRECT IMPACTS

The indirect impacts to land use planning under Alternative D would be similar to those discussed under elements common to all Master Plan Alternatives.

4.11.2.5 ALTERNATIVE F

DIRECT IMPACTS

Alternative F includes the elements common to all Master Plan Alternatives. In addition, the changes to the Haupt Garden proposed under Alternative F would potentially affect the historic character of the South Mall Campus to a greater degree compared to Alternative B. However, Alternative F would maintain the current grade of the Haupt Garden, and the entrance to the proposed below-grade Visitor Center would be located at-grade between the Castle and the Haupt Garden, resulting in fewer impacts to the historic relationship between the Castle and the Haupt Garden as compared to Alternative D. Under Alternative F, the pathways in the Haupt Garden would be reconfigured to improve campus circulation and wayfinding. The Haupt Garden would be expanded and restored, providing more space for programming and special events and adding to the symbolic and functional importance of the South Mall Campus. By removing the Sackler Gallery and NMAfA pavilions and relocating them closer to the National Mall, Alternative F would greatly improve the views of these museums to and from the National Mall and open up the Haupt Garden to the SW Ecodistrict. Under Alternative F, one portion of the west perimeter wall

of the Hirshhorn Plaza would be removed to create a connection to the Ripley Garden and AIB, which would enhance east-west connectivity. The remainder of the historic perimeter walls of the Hirshhorn Plaza would not be altered and would continue to act as physical and visual barriers between the South Mall Campus, the National Mall, and the SW Ecodistrict. Compared to the other Master Plan Alternatives, Alternative F would eliminate some physical and visual barriers and improve connections between the South Mall Campus, the National Mall, and the SW Ecodistrict, while still maintaining the historic character of the South Mall Campus to the greatest extent possible. Therefore, Alternative F is consistent with the Comprehensive Plan and SW Ecodistrict Plan goals for pedestrian-oriented development and for improved connections to public space, and the most consistent with the Urban Design and Historic Preservation Elements of the Comprehensive Plan compared to the other Master Plan Alternatives.

Alternative F would restore and renovate historic buildings consistent with the National Mall Plan's cultural resource goals of improving buildings and architectural features. However, removal of the Quadrangle pavilions would alter the landscape. Alternative F includes additional program space which is consistent with the National Mall Plan's goals for the civic stage. Alternative F also adds and consolidates visitor amenities and improves visibility of museum entrances which are in keeping with the National Mall Plan's goals for improved visitor experience and improved access and circulation.

INDIRECT IMPACTS

The indirect impacts to land use planning under Alternative F would be similar to those discussed under elements common to all Master Plan Alternatives.

4.11.3 WHAT MEASURES WOULD BE TAKEN TO ENSURE THE SOUTH MALL CAMPUS MASTER PLAN IS CONSISTENT WITH FEDERAL AND LOCAL PLANNING ORDINANCES?

The Master Plan Alternatives were developed to provide a long-term, holistic plan for the entire South Mall with extensive input from NCPC, CFA, DCOP, DDOT, USDA, GSA, and NPS, among others, to ensure that the alternatives are consistent with federal and local planning ordinances. The South Mall Campus Master Plan would be subject to review and approval by NCPC.

4.12 TRAFFIC AND TRANSPORTATION

4.12.1 WHAT MAKES UP THE LOCAL ROADWAY NETWORK?

The study area is formally located in the Southwest Federal Center neighborhood, in Ward 6, between the National Mall and I-395. The neighborhood is primarily a business district and almost entirely occupied by offices for various branches of the federal government and many of SI's museums. Bounded by Jefferson Drive, SW to the north, Independence Avenue, SW to the south, 14th Street, SW to the west, and 7th Street, SW to the east, the study area includes the South Mall Campus. The study area includes the following signalized intersections:

- Independence Avenue, SW and 14th Street, SW
- Independence Avenue, SW and 12th Street, SW
- Independence Avenue, SW and L'Enfant Plaza, SW
- Independence Avenue, SW and 9th Street, SW
- Independence Avenue, SW and 7th Street, SW
- Jefferson Drive, SW and 14th Street, SW
- Jefferson Drive, SW and 12th Street, SW
- Jefferson Drive, SW and 7th Street, SW

Characteristics of the study area roadways were obtained from maps on the DDOT website denoting functional classification, 2015 Average Annual Daily

Traffic (AADT), speed limits, and truck routes/loading zones. This information is summarized in Table 4-10. The table also lists the number of lanes and parking types as observed during a roadway inventory.

Table 4-10. Study Area Roadway Characteristics

Roadway	Functional Class	2015 AADT	Number of Lanes, Division	Parking Type	Speed Limit (mph)	Primary Truck Route/Designated Loading Zones?
Jefferson Drive, SW	Local	6,300	1, Undivided	On-street 3 Hour Limit	15	No/No
Independence Avenue, SW	Principal Arterial	27,500	8, Undivided	On-street Metered	25	Yes/No
14 th Street, SW	Principal Arterial	41,500	7, Divided south of Independence Avenue SW	On-street Metered Special Permit	25	Yes/No
12 th Street, SW	Local	15,800	5, Divided south of Independence Avenue SW	On-street Metered	25	Yes/No
9 th Street, SW	Local	21,300	1, Undivided	On-street Metered	25	Yes/No
7 th Street, SW	Principal Arterial	17,300	8, Undivided	On-street Metered	25	Yes/No

*It should be noted that most on-street, metered parking in the study area is only permitted between specific hours. At all other times on arterials, the parking lane operates as a travel lane.

4.12.2 HOW WERE IMPACTS TO THE LOCAL ROADWAY NETWORK ASSESSED?

Stantec Consulting Services Inc. conducted a comprehensive data collection program to establish “average day” baseline conditions for vehicular, transit, pedestrian, and cyclist traffic within the study area. The program consisted of manual turning movement counts and queuing and loading activity observations. All data were collected on a typical weekday when District schools and Congress were in session and there were no major special events on the National Mall.

Saturday data was also collected on September 30th and October 7th, 2017. No issues were noted with the data collected on Saturday, September 30th at the intersections on Independence Avenue, SW and 9th Street, SW, and Independence Avenue, SW and 7th Street, SW. However, the intersections of Independence Avenue, SW and 14th Street, SW, Independence Avenue, SW and 12th Street, SW, and Independence Avenue, SW and L’Enfant Plaza, SW had inflated eastbound through volumes resulting from a baseball game occurring at Nationals Park in the Navy Yard neighborhood of Washington, DC on Saturday, October 7th, 2017. Volumes are adjusted for the incoming traffic by balancing them with turning movement counts taken on Saturday September 30th, 2017.

TURNING MOVEMENT COUNTS

Manual turning movement counts were collected during the PM peak period (3:30PM – 6:30PM) and Saturday peak period (12:00PM – 4:00PM) at the seven study intersections in September and October 2017. It should be noted that the weekday AM peak period is not included. Most of the SI facilities do not open until 10:00 AM, with the exception of the Castle, which opens at 8:30 AM. However, SI is planning to relocate many office staff from the Castle to another location as part of the Master Plan. Therefore, the proposed modifications to the

South Mall Campus are anticipated to have a negligible impact on the weekday AM peak hour operations of the adjacent roadway network.

QUEUEING OBSERVATIONS

Queuing observations were conducted during the turning movement counts to determine if additional unmet demand would need to be considered in the traffic analysis. Despite clear peak hour directional volume (westbound in the PM), the results of the queue observations show minimal to no queuing along Independence Avenue, SW and Jefferson Drive, SW. Therefore, it was determined that the traffic analysis did not need to consider additional unmet demand.

ANALYSIS METHODOLOGY

Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operating conditions, was performed for study area intersections using Synchro 9 traffic analysis software. This software package provides average control delay and level of service (LOS) for each lane group and for the overall intersection. LOS is an evaluation of the quality of operation of an intersection and is a measure of the average delay a driver experiences while traveling through the intersection. LOS is dependent upon a range of defined operating conditions such as traffic demand, lane geometry, and traffic signal timing and phasing.

Utilizing Synchro instead of the more basic Highway Capacity Software (HCS) is preferable for transportation networks with a series of closely-spaced signalized intersections, such as the Independence Avenue corridor. Under these conditions, Synchro is able to more accurately model the effects that the traffic operations (such as poor LOS or extensive queuing) at one intersection have on operations at an adjacent intersection. Furthermore, HCS cannot analyze complex intersections with more than four legs.

LOS can range from A to F and is based on the average control delay per vehicle. For a signalized intersection, LOS A indicates operations with an average control delay less than 10 seconds per vehicle, while LOS F describes operations with an average control delay in excess of 80 seconds per vehicle, or a volume-to-capacity (v/c) ratio greater than 1.0. Table 4-11 summarizes the 2010 Highway Capacity Manual (HCM) delay criteria for signalized intersections.

Table 4- 11. LOS Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)
A	Less than or equal to 10.0
B	> 10.0 and ≤ 20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	Greater than 80.0 or v/c > 1.0

Source: 2010 Highway Capacity Manual

While LOS D or better operations are generally deemed satisfactory from a traffic operations perspective, LOS E or F operations are often indicative of queuing and congestion. Improvements as recommended in this study seek to maintain or improve traffic operations to LOS D or better, as reported by Synchro.

Signal plans and timing directives were delivered by DDOT and were field-verified to accurately model signal operation type, phasing, detection, and cycle length in the Synchro files utilized for capacity analysis.

4.12.3 HOW WOULD THE SOUTH MALL CAMPUS MASTER PLAN IMPACT THE LOCAL ROADWAY NETWORK?

4.12.3.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

The No-Action Alternative consists of the existing roadway network with future traffic growth due to background volume growth and nearby developments. No site enhancements would be constructed; thus, no additional vehicle trips from the South Mall Campus are anticipated. Therefore, the No-Action Alternative would have a long-term, negligible, adverse impact on the study area transportation network. Table 4-12, below shows the overall intersection delay (seconds per vehicle) and LOS for the No-Action Alternative.

Table 4-12. 2040 No Action Capacity Analysis Results

Intersection	PM Peak Hour	Saturday Peak Hour
14 th Street, SW, and Jefferson Drive, SW	(43.7) D	(13.1) B
14 th Street, SW and Independence Avenue, SW	(94.1) F	(23.5) C
Independence Avenue, SW and 12 th Street, SW	(130.2) F	(20.4) C
Independence Avenue, SW, and L'Enfant Plaza	(23.7) C	(9.7) A
Independence Avenue, SW, and 9 th Street, SW	(26.9) C	(10.0) A
Independence Avenue, SW, and 7 th Street, SW	(57.0) E	(14.2) B
Jefferson Drive, SW, and 12 th Street, SW	(0.7) A	(4.0) A
Jefferson Drive, SW, and 7 th Street, SW	(10.0) A	(10.4) B

INDIRECT IMPACTS

There would be no indirect impacts to the local roadway network from the No-Action Alternative.

4.12.3.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

The elements common to all Master Plan Alternatives would not generate additional vehicular trips and therefore there would be no direct impacts to the local roadway network.

INDIRECT IMPACTS

There would be no indirect impacts to the local roadway network from elements common to all Master Plan Alternatives.

4.12.3.3 ALTERNATIVE B

DIRECT IMPACTS

Alternatives B, D, and F would all generate similar additional visitors and employees is anticipated to be similar in each alternative. The difference in square footage between alternatives reflects support spaces, which do not generate additional employee or visitor trips.

A person-trip generation and mode split estimate was calculated utilizing existing door counts, which include visitors and employees, as well as visitor mode share data provided by SI. It is anticipated that up to 602 new person-trips would be generated during the PM peak hour, and 2,144 new person-trips would be generated during the Saturday peak hour (Table 4-13). While transit, walking, and other non-auto modes will be represented in the analysis as person-trips walking to/from nearby transit stops or other major origins and destinations near the South Mall Campus, it is not appropriate to equate individual person-trips with vehicle trips. Information obtained from SI indicates an average group size is approximately three people. Thus, the number of vehicle person-trips

was divided by three to estimate the number of new vehicle trips that would be generated by the expansion (Table 4-13).

It is anticipated that up to 200 office staff members that currently occupy a portion of the Castle building will be relocated off-site as part of the Master Plan. The proposed expansion of the South Mall campus facilities would also likely require additional exhibit support staff and volunteers, although the exact number of additional staff is not known at this Master Plan level. However, it should be noted that the door count data includes visitors, staff, and volunteers. Therefore, it can be assumed that the trip generation figures shown in Table 4-13 include additional staff and volunteers. Furthermore, no PM peak hour credit was taken for the 200 existing employees that may potentially be relocated, due to the uncertainty around future staffing levels at this stage of the Master Plan effort. This provides for a conservative analysis which is flexible to future Master Plan changes and likely represents a maximum trip generation rate.

Table 4-13. Trip Generation and Mode Split

	PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total
Total Person Trips	91	511	602	1,149	995	2,144
Public Transit (49%)	45	251	295	563	487	1,051
Walking (20%)	18	102	120	230	199	429
Bike (6%)	5	31	36	69	60	129
Other (2%)	2	10	12	23	20	43
Total Non-Auto Person Trips	70	394	463	885	766	1,652
Vehicle (23%)	21	118	139	264	229	492
Total New Vehicle Trips	7	39	46	88	76	164

The data contained in Table 4-13 indicates that 77 percent of trips generated by the proposed Master Plan would utilize modes other than a personal vehicle, including transit, bicycle, and pedestrian modes. As such, the majority of trips are anticipated to enter and depart from the National Mall and Jefferson Drive, SW. The distribution of generated trips is shown in Figure 4-46. It should be noted that transit trips are shown as pedestrian trips connecting to nearby transit stops, including the Smithsonian/National Mall Metrorail station.

The results of the 2040 Action Alternatives capacity analysis revealed the additional site generated trips result in a long-term, negligible, adverse impact to traffic operations within the study area (Table 4-14). Increases in delay are primarily due to background growth in the study area that is anticipated to occur between 2017 and 2040, which will exceed existing capacity, even without the additional trips generated by the Master Plan Alternatives.

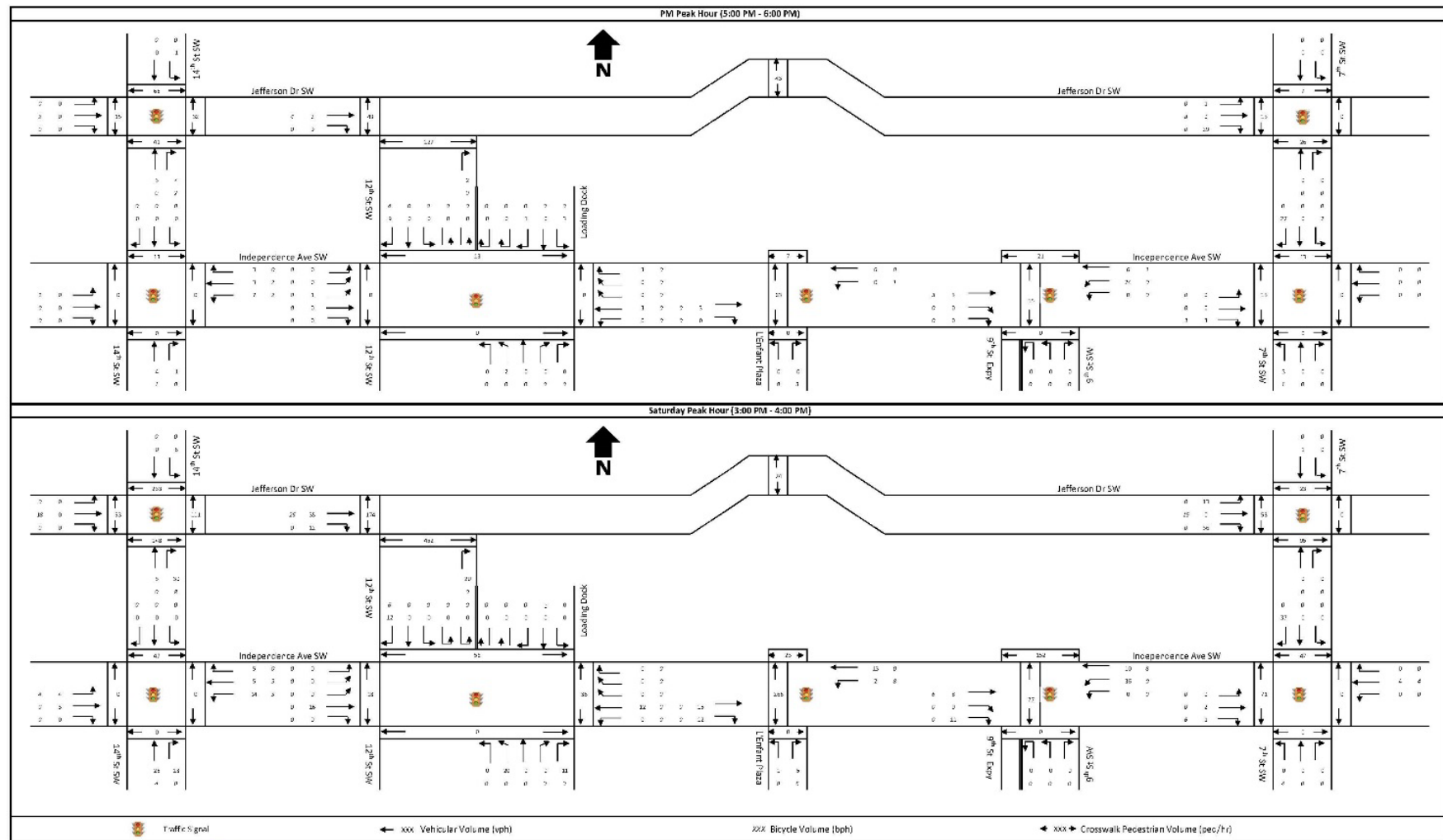


Figure 4-46. Distribution of Additional Trips Generated by the Master Plan Alternatives.

Table 4-14. 2040 No Action, Action, and Action with Mitigation Capacity Analysis Results

Intersection	PM Peak Hour		Saturday Peak Hour	
	No Action	Action	No Action	Action
14 th Street, SW and Jefferson Drive, SW	(43.7) D	(44.5) D	(13.1) B	(14.4) B
14 th Street, SW and Independence Avenue, SW	(94.1) F	(102.9) F	(23.5) C	(23.7) C
Independence Avenue, SW and 12 th Street, SW	(130.2) F	(108.7) F	(20.4) C	(32.8) C
Independence Avenue, SW and L'Enfant Plaza	(23.7) C	(23.0) C	(9.7) A	(10.1) B
Independence Avenue, SW and 9 th Street, SW	(26.9) C	(28.9) C	(10.0) A	(9.7) A
Independence Avenue, SW and 7 th Street, SW	(57.0) E	(58.1) E	(14.2) B	(14.0) B
Jefferson Drive, SW and 12 th Street, SW	(0.7) A	(1.2) A	(4.0) A	(121.6) F
Jefferson Drive, SW and 7 th Street, SW	(10.0) A	(10.5) B	(10.4) B	(12.0) B

INDIRECT IMPACTS

There would be no indirect impacts to the local roadway network from Alternative B.

4.12.3.4 ALTERNATIVE D

DIRECT IMPACTS

Direct impacts to the local roadway network under Alternative D would be the same as those described under Alternative B.

INDIRECT IMPACTS

There would be no indirect impacts to the local roadway network from Alternative D.

4.12.3.5 ALTERNATIVE F

DIRECT IMPACTS

Direct impacts to the local roadway network under Alternative F would be the same as those described under Alternative B.

INDIRECT IMPACTS

There would be no indirect impacts to the local roadway network from Alternative F.

4.12.4 WHAT PUBLIC TRANSIT FACILITIES AND SERVICES ARE AVAILABLE IN THE VICINITY OF THE SOUTH MALL CAMPUS?

4.12.4.1 BICYCLE

Bicycle facilities within a 1-mile bikeshed of the study area were assessed. Dedicated bicycle lanes and/or bicycle street right-of-way provided on the following streets: 4th, 6th, 8th, 9th, 10th, 11th, 12th, 15th, E, F, G, I, and Pennsylvania Avenue, SW. Off-street bike trails exist throughout the areas of the National Mall, Tidal Basin, and Washington Channel (see Figure 4-47). Bike routes and trails are signed on 4th Street SW and along the Washington Channel. There are no dedicated bicycle facilities along Independence Avenue, SW, or Jefferson Drive, SW. However, given the width of the sidewalks along this corridor, bicyclists were observed to ride both on street and on the sidewalks, particularly on the eastbound side of Independence Avenue, SW.

In addition to the network bicycle facilities, there are nine Capital Bikeshare stations within ¼ mile of the South Mall Campus. In addition, there are currently two public bicycle racks providing approximately 24 bicycle parking spaces along Jefferson Drive, SW at the South Mall Campus, and an additional public bicycle parking area that provides approximately 10 bicycle parking spaces across Jefferson Drive, SW from the South Mall Campus.



Figure 4- 47. Bicycle rack outside of Haupt Garden.

4.12.4.2 PEDESTRIAN

Pedestrian facilities within a ¼-mile walkshed were also assessed. Sidewalks varying in width from nine to 16 feet are along all study area roadways. Wide and clearly striped crosswalks are provided at intersection approaches and at two mid-block locations. Curb ramps and pedestrian countdown signal heads are provided at each crosswalk at each signalized intersection. Only two curb ramps at L'Enfant Plaza and Independence Avenue, SW; three curb ramps at 12th Street, SW and Jefferson Drive, SW; and one each at the mid-block crosswalks on Jefferson Drive, SW, have detectable warning surfaces.

4.12.4.3 TRANSIT SERVICES

Transit services within ¼-mile of the study area are provided by the following organizations:

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY (WMATA)

WMATA provides the most extensive services through its Metrorail and bus. Services generally begin at 5:00 AM Monday through Friday and 7:00 AM Saturdays and Sundays, and end at 12:00 AM Sunday through Thursday and 3:00 AM Friday and Saturday. The study area has one Metrorail station (Smithsonian/National Mall) on the Blue, Silver, and Orange lines. Bus stops for the 16X, 52, and V1 routes are located at or near the intersection of Independence Avenue, SW and 12th Street, SW for connections to Metrorail via the Smithsonian/National Mall station.

It should also be noted that the L'Enfant Plaza station, while outside of the study area, is located within walking distance, just south of the South Mall campus, and provides connection to the Blue, Silver, Orange, Green, and Yellow Lines.

DC CIRCULATOR (BY WMATA AND DDOT)

The DC Circulator's new National Mall Service operates from Union Station to various memorials and the Tidal Basin. From October to March, service begins at 7:00 AM on weekdays and 9:00 AM on weekends through 7:00 PM daily. Service is extended one hour during the summer months from April to September. The study area has two stops on Jefferson Drive, SW at 12th Street, SW and near 7th Street, SW. There is also another stop on Madison Drive, NW at 12th Street, NW.

MARYLAND TRANSPORTATION AUTHORITY (MTA)

The MTA runs many commuter bus lines into the District. Four routes, including the 230, 250, 630, and 725, have stops at the intersection of Independence Avenue, SW and 12th Street, SW. Connections to MTA are also available at the Smithsonian Metrorail station.

POTOMAC AND RAPPAHANNOCK TRANSPORTATION COMMISSION (PRTC)

PRTC operates the OmniRide commuter bus service into the heart of the District. Routes that service the study area include GV-R and LR-R (including select trips around the National Mall). Bus stops are located at the intersection of Independence Avenue, SW and 12th Street, SW near the Smithsonian Metro station.

LOUDOUN COUNTY TRANSIT COMMUTER BUS ROUTES

Loudoun County operates the LC Transit Commuter Bus Routes that make daily trips from Arlington, VA to the District in the AM and from the District to Arlington, VA in the PM. Marked stops are provided at the intersections of Independence Avenue, SW and 12th Street, SW; and Independence Avenue, SW and 10th Street, SW (L'Enfant Promenade).

4.12.4.4 PASSENGER LOADING FOR BUSES, TAXIS, AND TRANSPORTATION NETWORK COMPANIES

Passenger loading for buses primarily occurs along the Jefferson Drive, SW frontage between 12th Street, SW and 14th Street, SW, where parking is not permitted. Bus loading also sometimes occurs on Independence Avenue, SW during off-peak periods. There are no specific designated areas for taxis or transportation network companies to drop-off or pick-up passengers. It is likely that most of that activity occurs along Jefferson Drive, SW and Independence Avenue, SW.

4.12.5 HOW WOULD THE SOUTH MALL CAMPUS MASTER PLAN IMPACT BICYCLE, PEDESTRIAN, AND THE LOCAL TRANSIT NETWORK?

4.12.5.1 NO-ACTION ALTERNATIVE

The No-Action Alternative would not generate new bicycle, pedestrian or transit trips and therefore would not result in any direct or indirect impacts to the bicycle, pedestrian or local transit network.

4.12.5.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

The elements common to all Master Plan Alternatives would not generate new bicycle, pedestrian or transit trips, and, therefore, there would be no direct impacts to the bicycle, pedestrian or local transit network.

INDIRECT IMPACTS

There would be no indirect impacts to the bicycle, pedestrian, or transit network from elements common to all Master Plan Alternatives.

4.12.5.3 ALTERNATIVE B

The South Mall Campus is located in the National Mall, which is an area characterized by extensive bicycle, pedestrian, and transit facilities. The proposed South Mall Campus Master Plan is anticipated to have a negligible

impact on bicycle, pedestrian, and the local transit network because the extensive existing facilities are designed to accommodate large volumes of people on a daily basis, as well as for large events. Furthermore, the consolidation of the loading areas to one loading driveway would have a net benefit to pedestrian and bicycle safety because up to three existing uncontrolled curb cuts, which provide the potential for pedestrian and bicycle to vehicle conflicts, would be closed. The proposed consolidated driveway would be controlled by a signal which would control pedestrian, vehicle, and bicycle interactions.

The facilities and potential impacts are described in more detail below:

Alternative B is anticipated to generate approximately 36 new bicycle trips in the PM peak hour and 129 new bicycle trips in the Saturday peak hour. While there is available capacity on the Capital Bikeshare system, as well as at existing public bike racks, capacity should be monitored in the future to determine if additional capacity is needed. Furthermore, the consolidation of the loading areas to one loading driveway would have a net benefit to bicycle safety because up to three existing uncontrolled curb cuts, which provide the potential for bicycle to vehicle conflicts, would be closed. The proposed consolidated driveway would be controlled by a signal which would control vehicle and bicycle interactions.

PEDESTRIAN

Most pedestrian trips generated by the proposed expansion are anticipated to come from the National Mall. The South Mall Campus facilities and National Mall are interconnected by signalized crosswalks at 7th Street, SW and 14th Street, SW, as well as 11 unsignalized crossings, which would be more than capable of accommodating existing and future pedestrian trips. Furthermore, the consolidation of the loading areas to one loading driveway would have a net benefit to pedestrian safety because up to three existing uncontrolled curb cuts,

which provide the potential for pedestrian to vehicle conflicts, would be closed. The proposed consolidated driveway would be controlled by a signal which would control pedestrian and vehicle interactions resulting in long-term, beneficial impacts. Smithsonian should identify crosswalks adjacent to the project site that need to be updated to current standards as the project moves from Master Planning to design.

TRANSIT

Transit services within ¼-mile of the study area are provided by the following organizations:

The implementation of the Master Plan is anticipated to generate 295 new transit trips during the PM peak hour, and 1,051 new transit trips during the Saturday peak hour, the majority of which are anticipated to utilize Metro. The Smithsonian Metro station is directly across Jefferson Drive, SW from the South Mall Campus, and would likely be capable of supporting the additional transit trips, as the transit trips peak on the weekends when the overall Metro system is running under capacity.

INDIRECT IMPACTS

There would be no indirect impacts to the bicycle, pedestrian, or transit network from Alternative B.

4.12.5.4 ALTERNATIVE D

Direct and indirect impacts to the bicycle, pedestrian, and transit network under Alternative D are the same as those described under Alternative B.

4.12.5.5 ALTERNATIVE F

Direct and indirect impacts to the bicycle, pedestrian, and transit network under Alternative F are the same as those described under Alternative B.

4.12.6 HOW WOULD THE NEW LOADING DOCK IMPACT THE LOCAL TRANSPORTATION NETWORK?

4.12.6.1 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, three existing loading docks would remain. The existing loading facilities do not meet Smithsonian Institution Facilities Design Standards or DC loading requirements, and do not meet any of the design criteria for future servicing of the museums, which include two-way traffic, on-site vehicle turn around, and height clearance and sizing for large vehicles. Large box trucks and tractor trailers often back into or out of the loading areas, creating disruptions to traffic flow on Independence Avenue, SW. Large exhibition deliveries, which typically arrive in larger tractor trailers (WB-67), must park and load/unload on Independence Avenue, SW, which exposes the exhibit materials to unnecessary risk. The use of the existing loading docks would continue to have a long-term, moderate, adverse impact on Independence Avenue, SW.

4.12.6.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

A consolidated loading dock is proposed in all three Master Plan Alternatives at the intersection of Independence Avenue, SW and 12th Street, SW, on the west side of the Freer Gallery of Art. The consolidated loading driveway would have a net benefit to the overall traffic operations and safety along Independence Avenue, SW. The proposed loading dock would eliminate breaks in the current campus site plan, allowing for a cohesive connection across the entire campus for visitors, and will provide SI with an underground loading area that provides adequate space to separate collections loading from food and garbage loading, and that allows for large trucks to maneuver below grade rather than in the street. Trucks, up to WB-67 tractor trailers would be able to turn around within the underground loading area, minimizing disruptions to the traffic, pedestrian, and bicycle operations on Independence Avenue, SW. This would create a long-term, beneficial impact to local roadways and the transportation network.

The proposed consolidated loading driveway is not anticipated to generate new truck trips. A new actuated signal phase would be required at the intersection of Independence Avenue, SW and 12th Street, SW to accommodate the proposed loading driveway. However, most deliveries are scheduled for off-peak periods. Therefore, the impact of the additional signal phase is anticipated to be minimal during peak periods because of the low number of trucks that are anticipated to use the driveway during those times. Furthermore, the consolidation of the loading areas to one loading driveway would have a net benefit to pedestrian and bicycle safety because up to three existing uncontrolled curb cuts, which provide the potential for pedestrian and bicycle to vehicle conflicts, would be closed. The proposed consolidated driveway would be controlled by a signal which would control pedestrian, vehicle, and bicycle interactions. This would create a long-term, beneficial impact to local roadways and the transportation network.

INDIRECT IMPACTS

There would be no indirect impacts to the local roadway network from the loading dock proposed under elements common to all Master Plan Alternatives.

4.12.6.3 ALTERNATIVE B

Under Alternative B, direct and indirect impacts on the local transportation network from a consolidated loading dock are the same as those described under elements common to all Master Plan Alternatives.

4.12.6.4 ALTERNATIVE D

Under Alternative D, direct and indirect impacts on the local transportation network from a consolidated loading dock are the same as those described under elements common to all Master Plan Alternatives.

4.12.6.5 ALTERNATIVE F

Under Alternative F, direct and indirect impacts on the local transportation network from a consolidated loading dock are the same as those described under elements common to all Master Plan Alternatives.

4.12.7 WHAT MEASURES WOULD BE TAKEN TO MINIMIZE IMPACTS TO THE LOCAL TRANSPORTATION NETWORK?

Given the built-out nature of the transportation network within the area, emphasis was placed on improving the overall intersection operations through adjustments to signal timing and phasing. No new capacity (i.e. additional lanes) are proposed. To address the capacity deficiencies identified utilizing DDOT criteria, the following mitigation measures are recommended:

- Signal timing, phasing, and offset modifications, including an increase in cycle lengths from 110 seconds to 150 seconds in the PM peak hour. This provides an improved balance in delay between movements and would likely need to be conducted as a part of a wider signal retiming effort, required in the future to accommodate background growth and other projects by 2040.
- Modify the existing unsignalized intersection of Jefferson Drive, SW and 12th Street, SW from a two-way stop controlled intersection to an all-way stop controlled intersection. Modifying the Jefferson Drive, SW eastbound shared thru-right movement from a free movement to a stop-controlled movement would grant more acceptable gaps for pedestrians to cross Jefferson Drive, SW, along with reducing delay for right turning vehicles on 12th Street, SW. This would be subject to NPS approval. SI would get NPS approval on any permits needed for use of NPS land.
- Modify the southbound 14th Street, SW approach to Jefferson Drive, SW to include a protected-permitted left-turn phase.

The results of the capacity analysis reveal that the proposed mitigation measures would address the additional delay and queueing that was identified in the 2040 Action Alternatives capacity analysis (Table 4-15).

Table 4-15. 2040 No Action, Action, and Action with Mitigation Capacity Analysis Results

Intersection	PM Peak Hour			Saturday Peak Hour		
	No Action	Action	Mitigation	No Action	Action	Mitigation
14 th Street, SW and Jefferson Drive, SW	(43.7) D	(44.5) D	(26.3) D	(13.1) B	(14.4) B	(16.9) B
14 th Street, SW and Independence Avenue, SW	(94.1) F	(102.9) F	(88.5) F	(23.5) C	(23.7) C	(25.2) C
Independence Avenue, SW and 12 th Street, SW	(130.2) F	(108.7) F	(133.6) F	(20.4) C	(32.8) C	(30.6) C
Independence Avenue, SW and L'Enfant Plaza	(23.7) C	(23.0) C	(17.6) B	(9.7) A	(10.1) B	(10.0) A
Independence Avenue, SW and 9 th Street, SW	(26.9) C	(28.9) C	(16.4) B	(10.0) A	(9.7) A	(9.7) A
Independence Avenue, SW and 7 th Street, SW	(57.0) E	(58.1) E	(53.1) E	(14.2) B	(14.0) B	(14.0) B
Jefferson Drive, SW and 12 th Street, SW	(0.7) A	(1.2) A	(8.9) A	(4.0) A	(121.6) F	(9.6) A
Jefferson Drive, SW and 7 th Street, SW	(10.0) A	(10.5) B	(19.4) B	(10.4) B	(12.0) B	(11.2) B

In addition to vehicular mitigation measures, SI would continue to work with DDOT on the approval of the curb cut for the proposed new loading dock. The

following mitigation measures are recommended for bicycles, pedestrians, and loading:

- Monitor utilization of onsite bicycle parking, as well as Capital Bikeshare stations within ¼ mile. If demand exceeds capacity install new bike racks and/or a Capital Bikeshare Station. If a new Capital Bikeshare Station is required, consider locating it near the intersection of 7th Street, SW and Jefferson Drive, SW to fill an existing gap in the system.
- Upgrade all curb ramps connecting to/from the South Mall Campus to meet current ADA standards.
- Provide a new crosswalk across the westbound approach of Independence Avenue, SW at the intersection with 12th Street, SW.
- Monitor passenger loading areas to determine if they continue to meet SI needs without impacting traffic operations on Jefferson Drive, SW or Independence Avenue, SW.
- Schedule all deliveries made with trucks WB-50 or larger in advance. These deliveries will be scheduled to avoid the AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods, unless necessary. This would likely have a minimal impact on the South Mall Campus facilities, as the majority of deliveries with larger trucks currently occur during off-peak periods.
- Deliveries made in vehicles larger than a single unit truck should enter from northbound 12th Street, SW or eastbound Independence Avenue, SW to avoid wide right-turns into the proposed driveway.
- Right-turns on red should be restricted at the proposed driveway and the westbound Independence Avenue, SW approach at the signalized intersection with 12th Street, SW.

4.13 VISITOR USE AND EXPERIENCE

4.13.1 HOW DO VISITORS ACCESS THE SOUTH MALL CAMPUS MUSEUMS AND GARDENS?

The Castle's main entrance is on Jefferson Drive, SW, facing the National Mall. The south entrance of the Castle opens to the Haupt Garden.

The Quadrangle Building is a predominately below-ground structure that connects to three above-ground pavilions, including the Ripley Center Pavilion (commonly known as "the kiosk"), which is located in the northwest corner of the Haupt Garden; the Sackler Gallery Pavilion, located in the southwest of the Haupt Garden; and the NMAfA Pavilion, located in the southeast corner of the Haupt Garden. The entrances to the Sackler Gallery and NMAfA pavilions are inconspicuous and are not visible from the National Mall. They are visible from Independence Avenue, SW, but partially obscure vistas to the Haupt Garden and surrounding historic buildings. These pavilions are the only aboveground entrances to these facilities, which are separated above- and below-ground by gardens, walls, service drives, and tunnels. The Quadrangle Building facilities connect to the Freer Gallery and are all connected via underground passageways, but moving between museums often requires visitors to take the stairs and/or elevators to move from one to another. There is also a service and loading connection from the Quadrangle Building to the Castle.

The Haupt Garden serves as the "roof" for the Quadrangle Building below. This garden is the only gated garden on the South Mall Campus and has five entrances. The main entrance is through the Renwick Gates, facing south along Independence Avenue, SW between the Sackler Gallery and the NMAfA entrance pavilions with an additional entrance between NMAfA and AIB. The garden can also be accessed from the north directly from the Castle's south doors. Other entrances are located to either side of the Castle on the northwest and northeast corners of the Garden.

The Freer Gallery and Courtyard are located on the western portion of the South Mall Campus. The building is accessed through two entrances on the National Mall (Jefferson Drive, SW) and Independence Avenue, SW. The Freer Gallery is also connected to the Quadrangle Building via an underground passageway to the Sackler Gallery. There is no universally ADA accessible public entrance to the Freer Gallery. There is limited access for persons with disabilities through an employee side door entrance along Independence Avenue, SW.

The Hirshhorn Museum is a four-story, circular building with a hollow center over an outdoor plaza with a large fountain. The Hirshhorn's visitor entrance is from the south on Independence Avenue, SW and an ADA accessible entrance is located on the north side of the building that connects to the museum lobby. Currently, the Hirshhorn is not connected to any other buildings. The Sculpture Garden is located to the north of the Hirshhorn Museum across Jefferson Drive, SW. The Hirshhorn and the Sculpture Garden were formerly connected by an underground tunnel which has since been enclosed. The Ripley Garden and a loading area for service and delivery vehicles separate the Hirshhorn from the AIB. There are currently ADA accessible ramps on the north side of the Sculpture Garden, but not on the south side from Jefferson Avenue, SW.

The Ripley Garden is located east of the AIB. The main entrance to the Ripley Garden is located on Jefferson Drive, SW between the AIB and the Hirshhorn, although the garden can also be accessed from a south entrance on Independence Avenue, SW. The Folger Rose Garden is located east of the Castle and north of the AIB along Jefferson Drive, SW, and is openly accessible to pedestrians.

Pedestrians have unrestricted access to all gardens on the South Mall Campus during public hours. The only vehicles that are permitted within the gardens are SI garden maintenance and collections management vehicles.

4.13.2 WHAT ARE THE VISITOR DEMOGRAPHICS AND CHARACTERISTICS OF VISITORS TO THE SOUTH MALL CAMPUS?

SI is the world's largest museum, education, and research complex, including 17 museums in the Washington, DC area alone. SI has attracted over 25 million visitors per year since FY 2009. Over the last 10 years visitation to the Smithsonian museums along the National Mall has increased 12 percent (overall Smithsonian visitation has increased 16 percent over the last ten years). In fiscal year 2016 the Smithsonian welcomed 29.3 million in-person visits to its museums and Zoo. More Smithsonian visitors are entering the museums from the surrounding city streets. Whereas historically, 65 percent of National Mall museum visitors have entered through the Mall doors, over the last five years that number has lowered in favor of the entrances off of the Constitution Avenue, NW for American History and Natural History museums. One possible reason is the renaissance of the downtown neighborhood Penn Quarter. Therefore, with the newly founded South West Business Improvement District and the multi-billion dollar Wharf along the south west water front SI expects the museum entrances along Independence Avenue, SW to see a similar increase in foot traffic.

A study of SI visitorship in 2017 indicates that SI museums attract people of all ages, from infants to senior citizens. Approximately 75 percent of SI visitors are non-local U.S. residents, while 15 percent of visitors are local, and 10 percent are from other countries. Over half of visitors to SI museums are repeat visitors who have been to the Smithsonian at least once before. Over 85 percent of visitors come with a group, such as families, school groups, and tour groups (SI OPA, 2017).

The South Mall Campus contains five principal buildings and four designated gardens. The buildings house a range of Smithsonian programs, offices, and institutions, including the Castle and four major museums. All of these museums are open 364 days a year, excluding December 25th. Visitation at the

South Mall Campus occurs year-round, although peak visitation occurs in the summer months. The Castle and Visitor Center are open from 8:30 AM to 5:30 PM. All other SI buildings on the South Mall Campus are open from 10:00 AM to 5:30 PM. The Smithsonian Gardens are open 365 days a year. The Haupt Garden is the only garden with restricted hours and is only open from dawn to dusk year-round.

The museums on the South Mall Campus are exclusively art museums, which face particular challenges in attracting and engaging audiences due to the public's lack of familiarity with their subject matter (SI OPA, 2001). The study of SI visitorship in 2004 found that these art museums tend to attract a higher percentage of repeating or experienced visitors and adults than the science and American culture museums found elsewhere on the National Mall, which tend to attract more first-time visitors and families with children. The South Mall Campus museums are visited by a higher percentage of DC area residents than the science and American culture museums, which are primarily visited by non-locals (OPA, 2004).

The Smithsonian Castle is the iconic heart of SI, and it incorporates several functions, including the office of the Smithsonian Secretary and the Visitor Center which provides information on the National Mall, including the South Mall Campus. Most of the visitors to the Castle are seeking information from the Visitor Center about Smithsonian museums, but a similar number of visitors are attracted to the Castle itself as an architectural and historical landmark. The Castle also frequently hosts its own museum exhibitions, which is another attraction for visitors. On average, the Castle has over a million visits per year (SI OPA, 2012). The Castle Commons area features other museums and exhibits throughout the Smithsonian.

The AIB was constructed in 1881 and originally served as the US National Museum. The building was rehabilitated between 1972 and 1976 and was

reopened to the public in 1976 to coincide with the Bicentennial. The AIB is currently only open to the public when it is hosting a special event or exhibition. In 2016 and 2017, the AIB hosted the two-day Crosslines Culture Lab art exhibition sponsored by the Smithsonian Asian Pacific American Center and the marketplace for the Smithsonian Folklife Festival. The building can be made available for private, Smithsonian-sponsored events.

The Freer Gallery of Art and the Sackler Gallery, within the Quadrangle Building, contain the SI's collection of Asian art, dating from Neolithic times to the present. The Freer closed for renovation in January 2016 and reopened in October 2017. Prior to its closure for renovations the Freer Gallery hosted 89,000 visitors in the first four months of FY 2016 (October-January). In years prior to the closure, the Freer Gallery hosted an average of 500,000 visitors per year. The Sackler Gallery has averaged 272,000 visitors per year since FY 2008. A visitor study was conducted in 2007 for the Freer and Sackler Galleries. According to the study, approximately one-third of total visitors to the Freer and Sackler Galleries visit both galleries; one-third visit only the Freer, and one-third visit only the Sackler Gallery. Visitation and audience characteristics vary greatly depending on the current exhibitions on display at the galleries. Certain exhibitions attract a high percentage of local residents, while others attract more non-local residents. The study indicated that the Freer Gallery is generally more attractive to non-local visitors than the Sackler Gallery, likely due to the Freer's National Mall-facing main entrance. The Sackler Gallery is more attractive to DC area residents, especially those who are visiting a specific exhibition. Local residents are also much more likely to know about and use the aboveground Sackler Gallery entrance in the Haupt Garden than non-local residents (SI OPA, 2007).

NMAfA, within the Quadrangle Building, exhibits traditional and modern/contemporary art from the entire continent of Africa. The museum has attracted an average of 293,000 visitors per year since FY 2008. As of February 2017,

almost 52,000 people have visited during FY 2017. NMAfA attracts a much larger African and African-American visitor pool (40 percent of visitors) than the other museums on the South Mall Campus and the Smithsonian as a whole (7 percent) (SI OPA, 2004a).

The Hirshhorn Museum and Sculpture Garden contains SI's collection of more than 12,000 pieces of contemporary art. Approximately 50 pieces of sculpture are on display at any given time in the Sculpture Garden. The Hirshhorn hosts an average of 585,000 visitors per year. A 2006 study of visitors to the Hirshhorn indicates that the most common reasons for visiting the museum are an interest in contemporary art and an opportunity to have a unique experience with friends or family. Approximately 35 percent of visitors to the Hirshhorn are DC area residents; the remaining visitors consist of 55 percent non-local U.S. residents and 9 percent international visitors. The museum attracts a roughly even distribution of age groups and generations, although older visitors report higher interest in contemporary art and exhibitions while younger visitors attend for social reasons. Approximately a quarter of visitors come to the Hirshhorn specifically to see the Sculpture Garden. Almost 80 percent of respondents state that the Hirshhorn is a must-see museum for anyone visiting the Smithsonian (SI OPA, 2006).

The Smithsonian Gardens are considered outdoor museums that were designed to complement and enhance nearby buildings. Visitors are present in the South Mall Campus gardens year-round, although visitation tends to drop in the winter. Almost half of visitors to these gardens live and/or work locally, which is much higher than the percentage of local visitors to the Smithsonian overall (15 percent). Many local residents report walking through the Haupt or Ripley Garden on a daily basis, although most repeat visitors come weekly or several times per year. The South Mall Campus gardens experience the most visitors in the afternoons (SI OPA, 2005).

4.13.3 WHAT RESOURCES AND PROGRAMS ARE AVAILABLE TO VISITORS AT THE SOUTH MALL CAMPUS?

Educational programs within the SI have attracted an average of 5.4 million people per year since 2012. These programs, offered in collaboration with Smithsonian Associates, include on-site docent-led tours and programs, digital learning, field trips for school groups, performances, seminars, lectures, studio art classes, film screenings, summer camps, and special events. In addition to the Smithsonian Associates programs, each museum and building within the South Mall Campus hosts its own series of programs, events, and exhibitions. Information about these events can be found at the Smithsonian Castle Visitor Center, as well as the information desks and websites of each individual museum.

The Castle houses the Smithsonian Visitor Center and provides information and advice about what to see and do during a visit to any of the Smithsonian museums. The Castle includes an information desk, a member services desk, roving staff members and volunteers, and a Trip Planner kiosk through which visitors can plan a personalized route throughout the Smithsonian museums and National Mall. Also on display are collection highlights from each Smithsonian museum. A café, gift shop, and restrooms are also available. The SI OPA conducted a study of visitors to the Castle in 2012 to identify the types of information visitors are looking for when they enter the Castle and the methods by which visitors prefer to get this information (e.g. roving or desk staff members, handouts, computers, smartphone apps, etc).

Over 70 percent of visitors make an effort to plan their visit ahead of time. The Smithsonian website is the most commonly cited resource for planning visits ahead of time, followed by word-of-mouth recommendations, guidebooks, and other sources. Once inside the Castle, almost half of visitors tend to prefer printed materials as the primary means of getting information. However, the study indicates that other methods, such as talking to staff, computers, graphic

displays, and smartphone apps, were important to almost equal numbers of visitors, demonstrating that a mix of all of these methods is necessary to distribute information (SI OPA, 2012).

The Freer and Sackler Galleries host films, musical and theater performances, tours, talks/lectures, studio exhibitions, and teens' and children's programs showcasing Asian art and culture. Both galleries have roaming docents who engage visitors and answer questions about collections, exhibitions, and the museums. The Freer Courtyard includes a fountain and a Japanese granite lantern.

NMAfA provides programs for audiences of all ages, including artist talks, films, lectures, literature programs, and monthly workshops and hands-on activities for DC public school attendees. In addition, NMAfA hosts an annual Community Day in September, during which performers, artists, musicians, and other creative people can come together to celebrate African culture.

The S. Dillon Ripley Center is the home of the International Gallery, Smithsonian Associates, the Discovery Theater, and the Smithsonian Traveling Exhibition Service. Discovery Theater at the Ripley Center is a program of the Smithsonian Associates and presents over 300 live educational performances for children, school groups, and families each year. The Center also includes a conference center, meeting rooms, and classrooms.

Programs at the Hirshhorn include lectures, gallery talks, films, guided and self-guided tours, and daily highlights tours. The Hirshhorn also has a library containing books and materials related to artists in the Hirshhorn's collection and exhibitions. Members of the public must make an appointment to use this library.

The Hirshhorn Sculpture Garden pieces are irregularly displayed and moved or alternated approximately four to five times per year. The Sculpture Garden also

houses ARTLAB+, a free digital arts program that provides professional technological equipment, art tools, materials, mentoring, and workshops for aspiring digital artists between the ages of 13 and 19 during after-school hours.

The Smithsonian Gardens provide educational opportunities through plant labels, interpretive signage, historical artifacts, and weekly guided tours and talks between May and September.

The National Mall and Memorial Parks, an administrative unit of the NPS, has its own mobile application (app) for iOS and Android, which includes information on 70 sites, including the Smithsonian Museums at the South Mall Campus. The app provides a map, walking directions, transit options, interactive guided tours, ranger-led program schedules, events and news, and an augmented reality lens. NPS park rangers are on duty throughout the National Mall from 9:30 AM to 10:00 PM daily. All ranger-led programs and activities, including talks, walking and bike tours, book discussions, and volunteer events, are free of charge. The National Mall itself is open year-round, 24 hours a day.

4.13.4 HOW WOULD THE SOUTH MALL CAMPUS MASTER PLAN IMPACT VISITOR USE AND EXPERIENCE AT THE SOUTH MALL CAMPUS

4.13.34.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

The No-Action Alternative represents a continuation of the existing visitor use and experiences provided by the SI. The SI would continue to provide visitors access to the facilities within the South Mall Campus. However, under the No-Action Alternative no clear east-west pedestrian connection from the east side of the Freer Gallery to the Hirshhorn Museum would be created. Visitors would continue to have to maneuver their way through the Quadrangle from the Castle in order to find the underground entrances to the NMAfA and the Sackler Gallery; and improved access and visibility from the National Mall and the Castle

to these museums would not occur. The No-Action Alternative would not improve access and visibility from the National Mall and the Castle for the NMAfA and Sackler Gallery. Visitor services would also not be centralized into one location. Lastly, no new amenities such as new educational, museum and event spaces would be constructed. The overall experience would continue to be less than one would expect of world class institution and museums. Under the No-Action Alternative, outdated mechanical systems would not be replaced with modern efficient units. SI would continue to use GSA steam and chilled water and would repair existing mechanical systems on an as-needed basis. Various exhibits would have to be closed to take care of building maintenance. The continued use of the GSA steam and chilled water service would remain below museum standards for preservation and protection of collections, which could affect the visitor experience if collections have to be taken out of circulation. Therefore, the No-Action Alternative would have a long-term, moderate, adverse impact on visitor use and experience.

INDIRECT IMPACTS

The SW Ecodistrict plan calls for up to an additional 1.8 million square feet of residential and/or hotel development directly across Independence Avenue, SW from the South Mall Campus. By expanding the residential development in this area, the South Mall Campus would be expected to see a rise in visitorship. Because visitor services would not be enhanced under the No-Action Alternative, the increase in visitors would result in an indirect, long-term, adverse impact to visitor use and experience.

4.13.4.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

Under all of the Master Plan Alternatives, construction, demolition, excavation, and renovation activities are planned which would result in temporary short-term, moderate, adverse impacts to visitor use and experience. Localized noise

levels would increase on the South Mall Campus as a result of construction equipment and activities and disrupt the visitor experience. The Castle would be closed during seismic bracing and restoration of the Castle, and construction of the new Visitor Center. Visitor Services would temporarily move to the AIB. The Haupt Garden and Quadrangle Building would be temporarily closed for the replacement of roof membrane. The offices and exhibits in these buildings would also be temporarily closed during construction. Lastly, the AIB would need to be closed for a period of time to underpin the west side of the foundation to support the AIB after below-grade excavations occur. The Master Plan would be completed in phases to help minimize disturbances, to the extent possible, to the visitor experience. Planned events would be coordinated to minimize disruptions to visitors during construction.

Upon completion of the Master Plan, a new centralized Visitor Center would be created that would enhance orientation by providing a central entrance to the Smithsonian. The Visitor Center would connect the Castle to new amenities within the Quadrangle Building. A new ADA visitor entrance would be installed on the east side of the Freer Gallery that would provide better access for persons with disabilities. The east door of the AIB would be improved to provide an east-west connection from the Haupt Garden to the Hirshhorn Plaza that is not currently there; thereby increasing the connectivity of the South Mall Campus. The surface parking lot east of the AIB would be removed and an expanded Ripley Garden would be created in its place, allowing for additional gardens and contemplative spaces for visitors. Perimeter security elements would be installed around the entire South Mall Campus to better protect visitors and the historic buildings that make up the South Mall Campus. Overall the visitor experience would be improved. Circulation throughout the South Mall Campus would be enhanced and visitors would be able to orient themselves and plan their visit to all SI facilities and museums on the National Mall. The actions that are common to all of the Master Plan Alternatives would have a long-term,

major, beneficial impact to visitor use and experience on the South Mall Campus.

INDIRECT IMPACTS

During construction, portions of the South West Campus would be closed to pedestrians and bicyclists affecting their ability to travel directly between memorials, monuments, and recreational spots on the east, west, north, and south sides of the South Mall Campus. Visitors would be required to take longer routes to reach their destination resulting in minor, indirect, short-term, adverse impacts to visitor use and experience.

The SW Ecodistrict plan calls for up to an additional 1.8 million square feet of residential and/or hotel development directly across Independence Avenue, SW from the South Mall Campus. By expanding the residential development in this area, the South Mall Campus would be expected to see a rise in visitorship. Implementation of the Master Plan would enhance visitor services in the South Mall Campus; therefore, the SW Ecodistrict and the South Mall Campus would indirectly have mutual beneficial, long-term, impacts on the visitor experience.

4.13.4.3 ALTERNATIVE B

DIRECT IMPACTS

Alternative B includes the elements common to all Master Plan Alternatives. Under Alternative B, construction, demolition, excavation, and renovation activities are planned which would result in temporary short-term, moderate, adverse impacts to visitor use and experience. Parts of the Hirshhorn Museum and Sculpture Garden would need to be closed during renovations. The removal of the Ripley Pavilion and the relocation of the Sackler Gallery and NMAfA entrances to the north side would occur at the same time as the replacement of the Quadrangle Building roof membrane. The Master Plan would be completed in phases to help minimize disturbances, to the extent possible, to the visitor

experience. Planned events would be coordinated to minimize disruptions to visitors during construction.

In addition to the elements that are common to all Master Plan Alternatives, overall visitor experience would be improved upon completion of the Master Plan under Alternative B. At the Hirshhorn a small opening would be inserted on the west plaza wall that would make accessing the Hirshhorn from the Ripley Garden easier and would enhance circulation through the South Mall Campus. In addition, the tunnel between the Hirshhorn Plaza and Sculpture Garden beneath Jefferson Drive, SW would be restored allowing visitors to access the Sculpture Garden from the Museum and vice versa. The removal of the Ripley Pavilion would allow for a new entrance to the improved Visitor Center south of the Castle that would better connect the Visitor Center to the Quadrangle Building where new amenities, office and exhibit space would be placed. The relocation of the Sackler Gallery and NMAfA entrances to the north side would reorient these two museums with the Quadrangle Building, the Haupt Garden, and the Castle. These projects would improve the visitor use and experience of the South Mall Campus resulting in a moderate, direct, long-term beneficial impact. However, even though a new centralized Visitor Center that properly connects to the Quadrangle Building underground and the entrances to the Sackler Gallery and the NMAfA would be relocated to the north side of the museums, underground museum spaces would continue to be hidden from the National Mall resulting in moderate, long-term, adverse impacts to visitor use and experience.

INDIRECT IMPACTS

During construction, part of the South West Campus would be closed to pedestrians and bicyclists affecting their ability to travel directly between memorials, monuments, and recreational spots on the east, west, north, and south sides of the South Mall Campus. Visitors would be required to take longer routes to reach their destination resulting in minor, indirect, short-term, adverse

impacts to visitor use and experience. After each phase of construction is complete, there would be long-term indirect beneficial impacts to visitor use and experience by providing a centralized Visitor Center would allow visitors to orient themselves and plan their visit to all SI facilities and museums on the National Mall and allow for better access and connectivity to visitor destinations east, west, north, and south the South Mall Campus.

4.13.4.4 ALTERNATIVE D

DIRECT IMPACTS

Alternative D includes the elements common to all Master Plan Alternatives. The In addition, the Hirshhorn Museum and Sculpture Garden would need to be closed during renovations. The removal of the Ripley, the Sackler Gallery and NMAfA pavilions would occur at the same time as the replacement of the Quadrangle Building roof membrane and the construction of the new entrance to the Visitor Center; as would the Haupt Garden expansion and addition of skylights. Under Alternative D, construction, demolition, excavation, and renovation activities would result in temporary short-term, moderate, adverse impacts to visitor use and experience. The Master Plan would be completed in phases to help minimize disturbances, to the extent possible, to the visitor experience. Planned events would be coordinated to minimize disruptions to visitors during construction.

In addition to the elements that are common to all Master Plan Alternatives, overall visitor experience would be improved upon completion of the Master Plan under Alternative D. The removal of the east security door at the AIB would allow for interior east/west circulation through the AIB and enhance circulation throughout the South Mall Campus. The north, east, and west walls of the Hirshhorn Plaza would be removed to provide greater accessibility to the museum and Sculpture Garden from the National Mall. In addition, the tunnel between the Hirshhorn Museum and Sculpture Garden beneath Jefferson Drive, SW would be reopened and expanded allowing visitors to access the Sculpture

Garden from the Museum and vice versa. New below-grade galleries in the Sculpture Garden would provide space for larger exhibitions of modern art, which SI currently cannot procure for exhibition due to space constraints. This would require the removal of the existing walls of the Sculpture Garden. The removal of the Ripley Pavilion would allow for a new below-grade dipped entrance into the Castle that would better connect the Visitor Center to the Quadrangle Building, which would house new educational and museum spaces. This would provide greater connectivity for visitors moving between buildings, which are currently separated above- and below-ground by gardens, walls, service drives, and tunnels. The entrances to the Sackler Gallery and the NMAfA pavilions would be removed and new museum pavilion entries would be constructed closer to the Castle that would be a part of the new Visitor Center below-ground entrance to allow for better visibility and access from the National Mall. Lastly, the Haupt Garden would be expanded and the pathways would be reconfigured to improve the circulation for visitors through the South Mall Campus. Skylights would be added to improve the interior daylighting into the Quadrangle Building museums and the Visitor Center. These projects would provide greater connection between the Castle and The Ripley Center, which would improve wayfinding and would increase the interaction of the visitor with the South Mall's educational facilities. A centralized Visitor Center would include expanded restroom, retail, and food services. These projects would improve the visitor use and experience of the South Mall Campus and would have a moderate, direct, long-term beneficial impact.

INDIRECT IMPACTS

The indirect impacts of Alternative D would be the same as those for Alternative B.

4.13.4.5 ALTERNATIVE F

DIRECT IMPACTS

The short-term impacts of Alternative F would be similar to Alternative D. Therefore, under Alternative F, construction, demolition, excavation, and renovation activities would result in temporary short-term, moderate, adverse impacts to visitor use and experience. However, Alternative F offers alternate phasing for the Master Plan which would minimize construction disturbances better than Alternatives B and D. The Master Plan would be completed in phases to help minimize disturbances, to the extent possible, to the visitor experience. Planned events would be coordinated to minimize disruptions to visitors during construction.

The impacts of Alternative F would be similar to Alternative D; except, under Alternative F a small opening would be inserted on the west plaza wall of the Hirshhorn that would make accessing the Hirshhorn from the Ripley Garden easier and would enhance circulation through the South Mall Campus. Furthermore, unlike Alternative D, where the Haupt Garden would be sloped, the Haupt Garden under Alternative F would maintain its current grade and the Parterre would remain. The Haupt Garden would also incorporate intimate and teaching gardens, and east-west circulation, which further enhances the visitor experience. In addition, Alternative F would provide new entrances to the Visitor Center closer to the Castle and the National Mall, which would stay on grade with the Castle and the Haupt Garden, providing greater connectivity from the National Mall and throughout the South Mall Campus. These enhancements would result in a major, direct long-term, beneficial impact to visitor use and experience.

INDIRECT IMPACTS

The indirect impacts of Alternative F would be the same as those for Alternative B.

4.13.5 WHAT MEASURES WOULD BE TAKEN TO MINIMIZE ADVERSE IMPACTS TO VISITATION AND EXPERIENCE AT THE SOUTH MALL CAMPUS DURING IMPLEMENTATION OF THE MASTER PLAN?

In addition to phasing the implementation of the Master Plan, the SI would provide appropriate signage and fencing would be used to keep passersby out of construction areas. Visitors to the South Mall Campus would be notified via SI's website to alert visitors to the potential for closed exhibits and/or constructions areas. In concert with using the SI's website, the SI would provide potential notifications via signage, postings on social media webpages, email blasts, and press releases. In addition, construction activities would be coordinated with SI in a manner that would minimize disruptions during planned events. Pathways through the South Mall Campus would be rerouted during construction to maintain bike and pedestrian flow.

4.14 HUMAN HEALTH AND SAFETY

4.14.1 ARE THERE ANY HAZARDOUS MATERIALS AT THE SOUTH MALL CAMPUS?

By 1978, the use of asbestos containing materials (ACMs) and lead-based paint (LBP) for building construction had been mostly banned by the EPA under the authority of the CAA. Federal regulations (40 CFR 61) require that an appropriate asbestos inspection be conducted prior to construction or demolition activities that could potentially disturb ACMs. An ACM is defined by the EPA as any material containing greater than 1.0 percent asbestos by weight. Friable ACM is defined by the EPA as any material which, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. Non-friable ACM is not considered toxic unless the material is disturbed or damaged in a way that releases asbestos fibers into the air (EPA, 2017d).

The US Department of Housing and Urban Development and District Code 6-997 define LBP as any paint containing more than 1.0 milligrams per square

centimeter (mg/cm²). Painted and glazed surfaces that contain detectable concentrations of lead, including concentrations less than the definition of LBP, must be handled in accordance with the Occupational Safety and Health Administration (OSHA) Lead in Construction Standard (29 CFR 1926.62). Other hazardous materials regulated by the EPA and DOE include mold, and Polychlorinated Biphenyls (PCBs), which can be found in certain types of electrical equipment. Due to the age of the buildings on the South Mall Campus, it is assumed that one or more of the hazardous materials described above can be found within portions of the buildings to be renovated.

Smithsonian Directive 419 outlines SI's Safety and Health Program, which is designed to provide a safe and healthful environment for its staff, volunteers, visitors, and collections.

4.14.2 WHAT SECURITY MEASURES ARE PROVIDED AT THE SOUTH MALL CAMPUS?

The South Mall Campus grounds and its various galleries and museums are open to the public on a daily basis, except for certain holidays. The buildings open in the morning from 8:00 to 10:00 AM and close from 5:00 to 7:00 PM. The Haupt Garden is the only garden with restricted hours, and is open from dawn to dusk year-round. There are special summer hours for the South Mall Campus and hours of operation may change for special exhibits. Security personnel are stationed at all entrances/exits to buildings on the South Mall Campus and in other strategic locations in buildings and around the grounds. None of the galleries require additional security screening to enter. Areas restricted to the public are blocked off with signs, ropes, and/or monitored by security personnel. According to the 2014 Blast/Security Report for the South Mall Campus, all buildings except for the Castle on the Campus are currently operating at a Facility Security Level (FSL) III and increased to a FSL IV by accounting for "intangible factors," which is permissible by the Interagency Security Committee (ISC) Determination Methodology (Weidlinger 2014).

The South Mall Campus is served by two law enforcement bodies, the US Park Police, and the DC Metropolitan Police Department (MPD). The US Park Police's jurisdiction encompasses "any unit of the National Park system, the District of Columbia and the environs of the District of Columbia" (NPS 2017). The South Mall Campus is within the Park Police Central District, located at 960 Ohio Drive, SW. The South Mall Campus also falls within MPDs First District, Sector 1D1, Police Service Area (101), located at 101 M Street, SW (MPD 2017).

Fire and EMS Service is provided to the South Mall Campus by the DC Fire and EMS Department (FEMS). The South Mall Campus is generally served by FEMS Battalion 6 which includes Fire Companies 2, 3, 7, 8, and 18.

4.14.3 WHAT ARE THE POTENTIAL IMPACTS TO HUMAN HEALTH AND SAFETY FROM THE PROPOSED ACTION?

4.14.3.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

Under the No-Action Alternative, only minor interior renovations to buildings would occur on an as-needed basis. If hazardous materials such as ACM or LBP are to be disturbed during basic maintenance of the buildings on the South Mall Campus, they would be abated in accordance with Subpart M of the EPA NESHAPS regulations, the OSHA Asbestos Standard for the Construction Industry, the OSHA Lead in Construction Standard, DC's Lead-Hazard Prevention and Elimination Act, and DC's asbestos program. SI's policies in the Safety and Health Program found in Smithsonian Directive 419 would also be followed. The disturbance of hazardous materials may cause them to become airborne which would result in increased health risks to construction workers. Strict adherence to the regulations and SI policies would ensure only a short-term, minor, adverse impact to human health and safety.

The removal of ACM and LBP would result in a long-term beneficial impact to human health and safety as prolonged exposure would be minimized.

Under the No-Action Alternative, no safety or security upgrades would be made to the South Mall Campus. Current security protocols would remain in place to maintain a safe experience for visitors which could leave the South Mall Campus vulnerable to security breaches. This would result in a long-term, minor, adverse impact to human health and safety.

INDIRECT IMPACTS

There would be no indirect impacts to human health and safety from the No-Action Alternative.

4.14.3.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

Under all Master Plan Alternatives, construction, demolition, excavation, and renovation activities are planned which could disturb ACM and LBP. These activities include the removing existing mechanical systems; renovating the Castle, the Hirshhorn Building, and the Sculpture Garden; and replacing the roof membrane of the Quadrangle Building. Any ACM or LBP materials would be abated in accordance with Subpart M of the EPA NESHAPS regulations, the OSHA Asbestos Standard for the Construction Industry, the OSHA Lead in Construction Standard, DC's Lead-Hazard Prevention and Elimination Act, and DC's asbestos program. SI's policies in the Safety and Health Program found in Smithsonian Directive 419 would also be followed. The disturbance of hazardous materials may cause them to become airborne which would result in increased health risks to construction workers. Strict adherence to the regulations and SI policies would ensure only a short-term, minor, adverse impact to human health and safety.

The removal of ACM and LBP would result in a long-term, minor, beneficial impact to human health and safety.

Additionally, as with any construction project, the potential exists for the proposed action to create safety hazards. Construction safety hazards include operating heavy machinery, working underground, working on ladders or scaffolding, and lifting heavy materials. Visitors would also be exposed to safety risks during construction which could include falling construction materials, construction equipment, and below-grade access points. Site workers would adhere to a health and safety plan and Smithsonian Directive 419 that describes potential hazards and the controls and practices selected to minimize hazards. Signage and fencing would be used to keep visitors out of construction areas and appropriate distances would be maintained between construction workers and vehicle traffic (if appropriate). Implementation of these plans and procedures would result in only short-term, minor, adverse impacts to human health and safety.

Under all Master Plan Alternatives, security upgrades would be implemented on the South Mall Campus to preserve buildings which would include blast protection, perimeter security elements, and visitor screening upgrades. These upgrades would serve to reduce the likelihood and impact of a Campus security breach which would protect the safety of visitors and employees. This would result in a long-term major beneficial impact to human health and security.

INDIRECT IMPACTS

The addition of security upgrades would also result in indirect beneficial impacts to human health and safety by providing visitor protection well into the future.

4.14.3.3 ALTERNATIVE B

Alternative B includes the elements common to all Master Plan Alternatives. Additional construction would occur in order to construct the visitor center under the Castle, relocate the entries to Sackler Gallery and NMAfA, remove a portion of the Hirshhorn Plaza west wall, restore the tunnel between the Hirshhorn and the Sculpture Garden, and construct a new below-grade central utility plant. These additional construction activities would adhere to the same health and safety measures described in the elements common to all Master Plan Alternatives. Therefore, the short-term impacts to safety and security would be the same as those described under elements common to all Master Plan Alternatives.

Alternative would not provide adequate daylight for staff because there would be no skylights in the design for the Quadrangle. In addition, the Quadrangle Building would be mostly configured as it is under the No-Action Alternative resulting in less room for security improvements as there would be under Alternatives D and F. These long-term impacts would be minor and adverse to the safety and security of the campus.

4.14.3.4 ALTERNATIVE D

Alternative D includes the elements common to all Master Plan Alternatives. Additional construction would occur in order to construct the visitor center under the Castle, remove the existing Quadrangle Building roof bulkheads, expand the extent of existing skylights and add new skylights, relocate and reconfigure the Sackler and NMAfA pavilions, remove portions of the Hirshhorn Plaza wall, restore, and expand the tunnel between the Hirshhorn and the Sculpture Garden, and construct a new below-grade central utility plant. These additional construction activities would adhere to the same health and safety measures described in the elements common to all Master Plan Alternatives. In addition, Alternative D has the advantage of consolidating entry locations

throughout the South Mall Campus, thereby having the potential for increased security. Therefore, impacts to safety and security would be the same as those described under elements common to all Master Plan Alternatives, but slightly improved.

4.14.3.5 ALTERNATIVE F

Alternative F includes the elements common to all Master Plan Alternatives. Additional construction would occur in order to construct the visitor center under the Castle, expand the Haupt Garden, relocate the entries to Sackler Gallery and NMAfA, expand the extent of skylights, remove a portion of the Hirshhorn Plaza west wall, reconfigure the Sculpture Garden, restore and expand the tunnel between the Hirshhorn and the Sculpture Garden, and construct a new below-grade central utility plant west of the AIB. These additional construction activities would adhere to the same health and safety measures described in the elements common to all Master Plan Alternatives. In addition, like Alternative D, Alternative F has the advantage of consolidating entry locations throughout the South Mall Campus, thereby having the potential for increased security. Therefore, impacts to safety and security would be the same as those described under elements common to all Master Plan Alternatives but consolidated entry locations add to improved security.

4.15 UTILITIES

4.15.1 WHO PROVIDES UTILITY SERVICE TO THE SOUTH MALL CAMPUS?

STEAM AND CHILLED WATER

SI purchases high-pressure steam and chilled water from GSA's Heating Operations and Transmission District (HOTD). High-pressure steam is fed from the National Museum of Natural History (NMNH) to the Castle basement for its use and also distributed to the AIB and the Freer Gallery. The GSA system does not allow SI to control the quality of its energy supply or the humidification

levels in Campus buildings, which does not meet museum standards for preservation and protection of collections.

ELECTRICITY

PEPCO provides electrical service to the South Mall Campus buildings via SI's own Museum Campus power distribution system. Power on the South Mall Campus originates from the NMNH basement. Power is then distributed to the Castle and the South Mall Campus via underground ductbanks and manholes. An onsite diesel generator provides emergency power to the Castle and the AIB (SI, 2009).

WATER AND SANITARY SEWER

DC Water provides potable water and sanitary service to each building on the South Mall Campus individually. DC Water purchases treated drinking water from the Washington Aqueduct, operated by the U.S. Army Corps of Engineers. The Aqueduct draws water from the Potomac River, which is then treated at either the Dalecarlia or McMillan treatment plant. The South Mall Campus is within DC Water's Low Service Area, which is served by the Dalecarlia and Bryant Street Pumping Stations. Wastewater from the South Mall Campus is treated at the Blue Plains Wastewater Treatment Plant located along I-295 in southwest DC (DC Water, 2016). Most stormwater on the South Mall Campus drains directly to the District's MS4, operated by DOEE.

NATURAL GAS

The South Mall Campus is within the Washington Gas service area, and natural gas lines are present at the South Mall Campus; however, since heat is provided by GSA's steam service, these gas lines are not used.

Each building on the South Mall Campus uses individual mechanical, electrical, and plumbing systems that are scattered throughout the Campus. With the

exception of the recently renovated AIB, these existing systems are reaching the end of their useful lives and require partial or total replacement. The Quadrangle Building and Hirshhorn Museum and Sculpture Garden systems are original to those buildings and have never been upgraded. Because the South Mall Campus is approximately 160 years old, the buildings are not energy efficient. The existing utilities are found in Figure 4-48.

4.15.2 HOW WOULD UTILITIES BE IMPACTED BY THE SOUTH MALL CAMPUS MASTER PLAN?

4.15.2.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

Under the No-Action Alternative, GSA, PEPCO, and DC Water would continue to provide steam, chilled water, electricity, drinking water, and sanitary service. No changes to utility demands would occur. Existing maintenance programs and

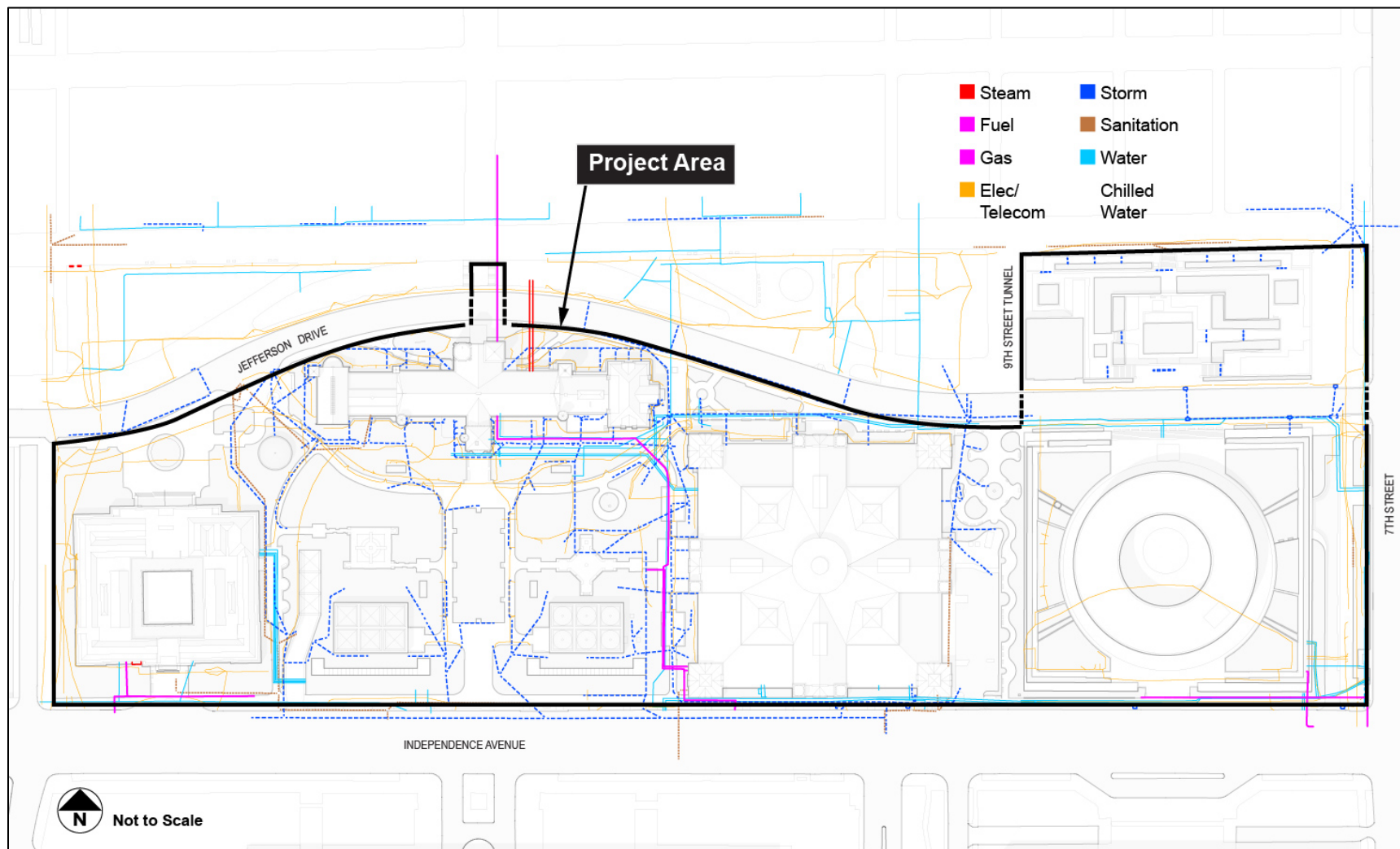


Figure 4-48. Existing Utilities Plan (Source: SIB Existing Conditions Report, 2009).

individualized repairs for the mechanical systems at each building would continue. The continual need to repair mechanical systems would have a short-term, minor, adverse impact on utilities.

No sustainability measures, such as energy-efficient lighting, low-flow plumbing fixtures, stormwater capture, or improvements to building envelopes would be implemented. Therefore, utility usage would continue to be high, and there would be a long-term, minor, adverse impact on utilities.

INDIRECT IMPACTS

Under the No-Action Alternative, energy consumption may increase as mechanical systems continue to age and become less efficient. In addition, the continued use of the GSA steam and chilled water service would remain below museum standards for preservation and protection of collections, potentially resulting in deterioration of museum artifacts and artwork over time. Therefore, the No-Action Alternative would result in indirect, long-term, moderate, adverse impacts related to utilities.

4.15.2.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

Under all of the Master Plan Alternatives, the AIB would be used as interim flexible space to accommodate the collections and programs of the buildings under construction. The AIB would require temporary additional utilities to support these interim uses. Temporary connections to the existing GSA steam and chilled water lines, PEPCO grid, and DC Water plumbing lines may be necessary until the new central utility plant is operational. The slight temporary increase in utility demands during construction would therefore have a short-term, negligible, adverse impact to utility providers.

Due to the proposed excavation throughout the South Mall Campus, existing utility lines would need to be relocated prior to construction. Utility providers

would be consulted and investigations would be performed prior to construction to verify the locations of existing utilities. Many of the buildings on the South Mall Campus would close and offices would be relocated during construction, so temporary utility disruptions would likely have a minimal effect on Campus operations. Construction would be phased to the maximum extent practicable to avoid service disruptions to Campus buildings that are still in use. Most of these utility lines would ultimately be removed, replaced, and/or rerouted to the central utility plant. Therefore, the elements common to all Master Plan Alternatives would result in short-term, minor, adverse impacts to utilities.

All Master Plan Alternatives propose the complete replacement and upgrade of mechanical, electrical, water, sanitary, and stormwater infrastructure in all campus buildings and throughout the South Mall Campus. A central utility plant would be constructed to serve the entire South Mall Campus.

The South Mall Campus would be permanently removed from the GSA chilled water and steam service. Chilled and hot water equipment would be installed in the central utility plant to service the entire South Mall Campus from a centralized location. The system would include redundancies in the production and distribution of chilled and hot water to minimize system disruptions.

PEPCO would continue to provide electricity to the South Mall Campus, but it would be routed through the central utility plant. Existing electric service rooms along Independence Avenue, SW would be removed, and a new single connection to the PEPCO grid would be installed in the central utility plant. The plant would include a centralized electrical system to power the chilled and hot water equipment and provide for the electrical needs of the Campus buildings. The system would include built-in redundancy to minimize power failures. A diesel emergency generator would also be installed in the central utility plant, which would provide power to elevators, fire alarms, stormwater pumps, and smoke control in the event of a power outage.

DC Water would continue to provide water and sanitary service. Water distribution would be routed through the central utility plant, rather than to each building individually. A new single water supply line to the central utility plant would be installed, and the existing water lines serving individual Campus buildings would be removed. Sanitary lines would be replaced and rerouted, and would ultimately drain to the city sewer lines on Independence Avenue. New sanitary and sump pump stations would be installed in any areas that cannot be drained by gravity, such as the Sculpture Garden. The existing stormwater systems throughout the South Mall Campus would be reconfigured to allow the capture and storage of stormwater, which would be reused to irrigate the South Mall Campus gardens, effectively reducing the demand for potable water. Green infrastructure, including the green roof above the Quadrangle Building and bioretention areas, would also reduce the amount of storm drainage entering the District's MS4 system.

Under all Master Plan Alternatives, the South Mall Campus would require natural gas service from Washington Gas, which is not currently used. New gas service would be installed from Independence Avenue, SW to the new central utility plant. New natural gas lines would be constructed to connect Campus buildings to the central gas system. The unused gas lines present throughout the South Mall Campus would be removed or upgraded.

Under all Master Plan Alternatives, the proposed changes in programming and addition of food service in several of the South Mall Campus buildings would require additional utility service compared to the current condition. However, the central utility plant would consolidate utility service in one location, providing a more efficient and reliable system and it would return space previously used for HVAC systems to education and collection spaces. SI would also implement campus-wide energy efficiency and sustainability measures, such as energy-efficient lighting, improved building envelopes, modernized HVAC systems, skylights, low-flow plumbing fixtures, and renewable energy

systems. By disconnecting from GSA steam and chilled water service, SI would have more control over the humidification of the South Mall Campus buildings, allowing for better protection and preservation of museum collections. By consolidating utility distribution in the central utility plant, upgrading infrastructure, and adopting sustainability measures throughout the South Mall Campus, the elements common to all Master Plan Alternatives would reduce the overall demand for utilities, resulting in a long-term, moderate, beneficial impact.

INDIRECT IMPACTS

Due to the proposed excavation throughout the South Mall Campus, existing utility lines would need to be relocated prior to construction, which could potentially result in disruptions to utility service for neighboring properties. This impact would be temporary, and relocations and new connections of utility lines would be completed with the least amount of disruption possible to other users. Utility providers would be consulted prior to construction, and any proposed relocations of utility lines would be coordinated with utility providers. Therefore, the elements common to all Master Plan Alternatives would result in short-term, minor, adverse impacts to utilities in the surrounding area.

By reducing demand for energy and water supplies throughout the South Mall Campus, all Master Plan Alternatives would lessen the burden on utility providers in the region. Stormwater collection and reuse would reduce the amount of storm drainage entering the District's MS4 system, ultimately reducing stormwater pollution in the Potomac River, the Anacostia River, and other District waterways. Therefore, the elements common to all Master Plan Alternatives would result in long-term, moderate, beneficial impacts to utilities on a regional basis.

4.15.3 WHAT CONSERVATION MEASURES WOULD BE INCORPORATED INTO THE DEVELOPMENT AT THE SOUTH MALL CAMPUS?

The central utility plant would consolidate utility service in one location, providing a more efficient and reliable system and overall reducing the demands to utility providers. SI would also implement campus-wide energy efficiency and sustainability measures, such as energy-efficient lighting, improved building envelopes, modernized HVAC systems, skylights, low-flow plumbing fixtures, and renewable energy systems. Stormwater throughout the South Mall Campus would be collected and stored to the maximum extent practicable in the central utility plant and would be reused for irrigation, reducing stormwater runoff and demand for potable water.

4.15.4 HOW WOULD OPERATION OF THE SOUTH MALL CAMPUS INCREASE ENERGY EFFICIENCY?

By adopting the energy efficiency measures described above, the South Mall Campus would reduce its energy usage by over 30 percent, reduce its carbon emission by 40 percent, and reduce its overall energy costs by over 50 percent per year. If any utilities that are to be impacted are on NPS-owned land, SI would get any permits needed from NPS for use of NPS land.

4.16 WASTE MANAGEMENT

4.16.1 HOW IS WASTE MANAGED ON THE SOUTH MALL CAMPUS?

Solid waste on the South Mall Campus is managed by SI's OFMR. Waste generated on the South Mall Campus include non-hazardous solid waste and recyclable materials, including but not limited to: beverage containers, paper, cardboard, scrap metal, wood pallets, batteries, cooking oil, food scraps, light bulbs, printer cartridges, compact disks, electronics of all types, and acrylic (SI, 2016). SI participates in the GSA National Capital Region's Recycling Program and also operates its own agency-wide Recycling Task Force. SI's current goal is to divert 80 percent of all solid waste generated at SI facilities from landfills by

2020 (SI OFMR, 2017). In addition, SI is committed to recycling or salvaging at least 50 percent of waste generated from construction projects at its facilities (SI OEDC, 2011).

GSA provides trash and recycling collection services at the South Mall Campus. Waste and recycling is collected from three loading facilities, which are scattered throughout the Campus. An underground loading dock in the Quadrangle Building, which is accessed via a vehicle ramp in the Haupt Garden, serves the Quadrangle Building, the Castle, and the Freer Gallery. The AIB has a surface loading dock and parking lot to the east, between the AIB and the Hirshhorn. The Hirshhorn is served by an underground loading facility that is accessed via a vehicle ramp along 7th Street, SW. Waste is then hauled to a District Department of Public Works transfer station and ultimately disposed at the Covanta Fairfax Energy/Resource Recovery Facility in Lorton, Virginia.

The existing loading facilities on the South Mall Campus are generally inadequately sized and cannot support multiple or large vehicles. Multiple locations for trash and recycling throughout the Campus requires multiple stops and trips, which is inefficient and time consuming. Due to the risks of damage to collections during transport and delivery, the SI Facilities Design Standards recommend that collections deliveries be kept as separate as possible from non-collections deliveries, food service, and trash and recycling streams (SI, 2012). The current loading docks on the South Mall Campus do not have dedicated collections docks; collections deliveries must share space with trash and recycling, food service, and other non-collections streams, which is inconsistent with the SI Facilities Design Standards.

4.16.2 HOW WOULD THE SOUTH MALL CAMPUS MASTER PLAN AFFECT WASTE MANAGEMENT?

4.16.2.1 NO-ACTION ALTERNATIVE

DIRECT IMPACTS

Under the No-Action Alternative, minimal construction waste would be generated as a result of basic maintenance and repairs throughout the South Mall Campus. No additional food service or programs would be implemented at the South Mall Campus, so waste would continue to be generated at its current level. The SI recycling initiatives would continue. The current loading docks would operate at their current level of efficiency. Since no changes would be made to waste generation or management, the No-Action Alternative would have no short- or long-term impacts to waste management on the South Mall Campus.

INDIRECT IMPACTS

Under the No-Action Alternative, waste would continue to be generated, managed, and disposed offsite at the current level, so no impacts to waste collection and management in the region would occur. Collections delivery and distribution would continue to share space with food and waste streams, which would be inconsistent with the SI Facilities Design Standards and would increase the risks of damage or deterioration of collection items over time. Due to the potential risks to collections, the No-Action Alternative would have a long-term, minor, adverse impact to waste management.

4.16.2.2 ELEMENTS COMMENT TO ALL MASTER PLAN ALTERNATIVES

DIRECT IMPACTS

Under all of the Master Plan Alternatives, solid waste would be generated from construction, demolition, excavation, and land-clearing during construction. Construction waste could include building components and structures, concrete, asphalt, wood, metals, roofing, flooring, and piping. A minimum of 50 percent

of construction waste would be reused, salvaged, or recycled in accordance with GSA and SI requirements. The remaining construction waste would be disposed at a landfill. The temporary increase in construction waste under all Master Plan Alternatives would result in a short-term, minor, adverse impact to waste management.

Under all Master Plan Alternatives, the proposed changes in programming and addition of food service in several of the South Mall Campus buildings would generate additional solid waste, food waste, and recyclable materials. To complement the existing recycling program, SI would also implement expanded composting, recycling, reuse, and return-to-vendor programs to reduce the amount of waste generated on the South Mall Campus (BIG/Kleinfelder, 2014). The proposed food and beverage systems on the South Mall Campus would use reusable, recyclable, or compostable dishes, cups, silverware, napkins, and other food service items. Recyclable and compostable materials would be separated from the landfill-bound waste stream to the maximum extent practicable. A central loading facility would be constructed beneath the Castle to service the Castle, the Freer Gallery, the Quadrangle Building, and the AIB. The central loading facility would consolidate the waste streams of several Campus buildings, which would provide a centralized, efficient system for trash and recycling sorting, storage, and removal. Dedicated loading bays would be provided for trash and recycling, collection deliveries, non-collection deliveries and services, and food service, in accordance with the SI Facilities Design Standards. Therefore, the elements common to all Master Plan Alternatives would result in long-term, moderate, beneficial impacts to waste management.

INDIRECT IMPACTS

Waste and debris generated during construction activities would be disposed of in a landfill, reducing the already-limited landfill capacity of the DC area. To minimize the amount of construction waste entering landfills, at least 50 percent of construction waste would be reused, salvaged, or recycled. The

contribution of construction waste from the South Mall Campus would be negligible compared to the overall volume of waste generated in the area. Therefore, the elements common to all Master Plan Alternatives would result in an indirect, short-term, negligible, adverse impact to waste management on a regional level.

The long-term efforts to divert waste from landfills on the South Mall Campus would result in an overall reduction in landfill waste. At least 80 percent of municipal waste would be diverted. The contribution of waste from the South Mall Campus would be negligible compared to the overall volume of waste generated in the area. Therefore, the elements common to all Master Plan Alternatives would have a long-term, negligible, adverse impact on waste management on a regional level.

4.16.3 WHAT MEASURES WOULD BE IMPLEMENTED TO REDUCE WASTE GENERATED AT THE SOUTH MALL CAMPUS?

In addition to SI's existing recycling program, SI would also implement expanded composting, recycling, reuse, and return-to-vendor programs to reduce the amount of waste generated on the South Mall Campus. The proposed food and beverage systems on the South Mall Campus would use reusable, recyclable, or compostable dishes, cups, silverware, napkins, and other food service items. Recyclable and compostable materials would be separated from the landfill-bound waste stream to the maximum extent practicable. These waste diversion and reduction methods would further SI's goal for 80 percent of institutional waste to be diverted from landfills by 2020.

4.17 CUMULATIVE EFFECTS

4.17.1 WHAT ARE CUMULATIVE EFFECTS AND WHY ARE THEY DISCUSSED?

CEQ regulations require federal agencies to assess the cumulative effects of federal projects during the decision-making process. Cumulative effects are defined as:

“the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7).

In other words, would the proposed federal project add to or interact with the environmental impacts of past, present, or future projects, regardless of the agency or group implementing those actions? This section of the EIS provides a description of the cumulative impacts that the proposed action, combined with other projects in the area, may have on the human environment.

4.17.2 WHAT PAST, PRESENT, AND FUTURE PROJECTS COULD ADD TO OR INTERACT WITH THE IMPACTS OF THE SOUTH MALL CAMPUS MASTER PLAN?

Development related to present and future projects, including the SW Ecodistrict, Monumental Core Framework Plan, National Mall Plan, Capitol Complex Master Plan, and moveDC could add to or interact with the impacts of the South Mall Campus Master Plan.

In addition, to the above-mentioned Plans, past, present, future projects that could add or interact with the impacts of the South Mall Campus Master Plan include:

Past Projects

- Woodrow Wilson International Center for Scholars – Established by an Act of Congress in 1968 as a living memorial to the 28th President. It was placed under jurisdiction of the SI and was given offices and a library and meeting room in the Upper Main Hall of the Castle in 1970. They remained there until 1998.
- Castle Great Hall renovations – Renovations in the 1960s, 1970s, and 1980s greatly changed the interior of the Castle that included refurbishing the Great Hall, developed the Great Hall into a Visitor Center, and culminated in the Castle as a welcome center for visitors.
- Hirshhorn Sculpture Garden Rehabilitation – Landscape architect Lester Collins redesigned the Sculpture Garden in 1977 to 1981 to address the vast expanses of gravel and limited vegetation within the Sculpture Garden, and to provide easier access for those with strollers and in wheelchairs.
- Hirshhorn Plaza Rehabilitation – Landscape architects Urban & Associates rehabilitated the Hirshhorn Plaza to include large granite pavers that extend from the original circular fountain. Beyond the paving, the plaza was divided into six garden spaces. At this time, the original stair and tunnel that provided access to Sculpture Garden beneath Jefferson Drive were covered.
- Changes to the Quadrangle Building – These changes include the 2004 redesign of the third sublevel of the Ripley Center to accommodate a theater, installation of wall board panels along the great hall and the removal of the basin of the fountain within the great hall was removed at an unknown date. Alterations to entrance pavilion of the NMAfA included installation of wallboard panels and placement of decorative wood screens in the arched openings of the south wall of the gallery.

Current and Future Projects

- National Air and Space Museum (NASM) Revitalization – Due to start in 2018, this project would replace NASM’s building exterior envelope, HVAC, plumbing, and fire protection systems. The project would also include revitalization of the landscape, portions of perimeter security, and addition of vestibules at the north and south entrances.
- International Spy Museum Relocation – The International Spy Museum is scheduled to relocate to a permanent home in L’Enfant Plaza in 2018. The new museum is 140,000 square feet and includes new resources for educational programming, a lecture hall/theater, and multifunction event space.
- Eisenhower Memorial – NPS, on behalf of the Dwight D. Eisenhower Memorial Commission, has developed a design for a Memorial to Dwight D. Eisenhower. The project was approved by CFA and NCPC in July 2015 and funds are currently being raised for its construction. The project is located on a four-acre site directly south of NASM.
- National Museum of Natural History (NMMH) Southside Improvements – The SI would be renovating the south entrance of the NMNH to provide an accessible pathway to the south entrance for visitors who cannot use stairs. The project is currently underway.
- U.S. Department of Agriculture (USDA) Site Improvement and Perimeter Security Plan - The USDA completed an EA that would provide landscaping and site improvements at both the Jamie Lloyd Whitten Building and the Agricultural South Building to implement the proposed People’s Garden, install permanent upgrades to perimeter security of the Whitten Building, and replace the guard booths along C Street, SW, at the South Building. The plan is currently underway.
- Museum of the Bible - The Museum of the Bible is currently under construction. The museum will explore the history and impact of the Bible. The 430,000- square foot museum is scheduled to open Fall 2017.

- National Women’s History Museum – Congress introduced legislation in 2017 to establish a National Women’s History Museum on the National Mall. A location for the museum has not yet been identified.
- Banneker Park Pedestrian Access Improvements – NPS has proposed an improved pedestrian connection between the National Mall and the waterfront along Maine Avenue, SW in Washington, DC, as identified in the SW Ecodistrict Plan and the National Mall Plan.

4.17.3 WHAT ARE THE CUMULATIVE EFFECTS FOR EACH IMPACT TOPIC?

GEOLOGY, TOPOGRAPHY, AND SOILS

Past construction and development has resulted in disturbance to soils and topography from clearing, grading, and subsurface activities throughout the District of Columbia. The South Mall Campus Master Plan could potentially contribute to short-term, indirect, adverse, cumulative impacts to soils due to increased soil erosion during construction activities in the area. Erosion and sediment control measures would be implemented during construction, which would ensure that short-term cumulative impacts to soils are negligible. Long-term, adverse, cumulative impacts would occur as a result of the continued development of land in the District of Columbia. However, since the District is already an intensely developed urban area with very few undisturbed areas, the overall long-term, adverse, cumulative impacts of the Master Plan Alternatives would be negligible.

SEISMIC VULNERABILITY

The impacts of the proposed seismic improvements would be localized to the South Mall Campus. No cumulative impacts would result.

STORMWATER RESOURCES

The South Mall Campus Master Plan could potentially contribute to short-term, indirect, adverse, cumulative impacts to stormwater due to increased soil

erosion during construction activities in the area. Land-disturbing activities in the District would be required to implement erosion and sediment control measures during construction in accordance with the 2013 Stormwater Rule, which would ensure that short-term impacts to stormwater are negligible. Development plans and projects in the District would also be required to comply with the onsite retention requirements of the 2013 Stormwater Rule, resulting in a long-term reduction in the volume of stormwater runoff entering District waterways. The South Mall Campus Master Plan would contribute to the indirect, long-term, major, beneficial cumulative impacts to stormwater in the District by retaining stormwater onsite to the maximum extent practicable.

AIR QUALITY

Construction of present and future development projects near the South Mall Campus would generate fugitive dust and emissions from construction activities and equipment resulting in a cumulative, short-term, adverse impact to air quality.

The Federal and District Elements of the Comprehensive Plan, SW Ecodistrict Plan, National Mall Plan, Center City Action Agenda, and many other District plans and policies include sustainability and efficiency initiatives that would ultimately reduce air emissions in the region. The installation or gradual replacement of mechanical systems with new, efficient units in existing buildings would reduce the potential effect new sources of emissions would have on air quality, resulting in a long-term, beneficial cumulative impact.

GREENHOUSE GASES, CLIMATE CHANGE, AND ENERGY CONSUMPTION

Nearby present and future projects, including the SW Ecodistrict, Monumental Core Framework Plan, National Mall Plan, Capitol Complex Master Plan, moveDC, and the International Spy Museum would have and would continue to have long-term impacts on the overall DC CO₂ emissions resulting from energy

consumption within the facilities. The work within the district is focused on improvement of existing assets as opposed to creating new facilities. For example, the SW Ecodistrict Plan is a revitalization project focused on sustainability practices to integrate land use, public transit and transportation, and environmental planning with high-performance buildings, landscapes, and infrastructure, rather than traditional single-building-scale strategies. The South Mall Campus Master Plan in combination with these other plans result in beneficial impacts to emissions as buildings/facilities are upgraded to increase water and energy efficiency. The overall cumulative impact of these past, present, and reasonably foreseeable future actions on GHG and climate change would be long-term and beneficial. The Master Plan Alternatives would contribute to the long-term beneficial cumulative impacts by decreasing the amount of energy use and improving the way energy is produced thereby decreasing their contribution to localized emissions.

CULTURAL RESOURCES

4.17.3.1 NO-ACTION ALTERNATIVE

The cumulative result of the lack of a coordinated approach to the protection, maintenance, and stabilization of cultural resources in the South Mall Campus—namely the Quadrangle Building, Castle, and Hirshhorn Museum buildings and the Hirshhorn Plaza and Sculpture Garden—would result in a moderate, long-term, adverse impacts to these resources. Reasonably foreseeable deterioration could be prevented and addressed in the short term in the absence of a Master Plan; however, longer term deferred maintenance needs, construction phasing, funding sources, and catastrophic events would be more comprehensively identified and addressed with the implementation of a master plan. The adverse impacts associated with the No-Action Alternative will have a lesser degree of intensity than the cumulative impacts associated with the Action Alternatives. This particularly applies to Alternatives D and F, which propose a greater degree of change to cultural resources across the project area.

4.17.3.2 ELEMENTS COMMON TO ALL MASTER PLAN ALTERNATIVES

Under the elements common to all Master Plan Alternatives, the degree of change proposed for the Castle Building—including interior restoration and rehabilitation, blast protection, base isolation, seismic bracing, basement expansion, and sub-basement excavation—has the potential to generate major cumulative adverse impacts on this resource, and by association on the National Mall and Smithsonian Quadrangle Historic Districts (to which the Castle is a contributing resource). To mitigate this cumulative adverse impact, the Castle treatment must be carefully designed and implemented to meet or exceed historic preservation standards for the treatment of historic properties.

4.17.3.3 ALTERNATIVE B

As noted in the elements common to all Master Plan Alternatives section, the degree of change proposed for the Castle has the potential to cause major adverse impacts on this resource as well as the National Mall and Quadrangle Historic Districts.

Additionally, the related actions proposed for the Quadrangle Building and Haupt Garden component landscape—including the replacement of the Quadrangle Building roof membrane, the relocation of the Quadrangle Building loading dock, the removal of the Ripley Pavilion, the potential construction of a new Visitor Center entrance near the Castle, and the restoration of the Haupt Garden in its current configuration—have the potential to create moderate adverse impacts on those resources.

4.17.3.4 ALTERNATIVE D

Cumulative impacts to cultural resources under Alternative D would be similar to those discussed under Alternative B, but more intensified as a reflection of the greater degree of change to the site and grade proposed under Alternative D. This includes the extensive sub-basement excavation beneath the Castle and the associated additional seismic bracing. Similarly, the changes proposed for the

Quadrangle pavilions and Haupt Garden features would result in a greater cumulative adverse impact to those resources.

Additionally, the greater degree of change proposed for the Hirshhorn Plaza walls, Sculpture Garden, and tunnel would result in a major cumulative adverse impact on the Hirshhorn Museum and Sculpture Garden.

4.17.3.5 ALTERNATIVE F

Cumulative impacts to cultural resources under Alternative F would be similar to those discussed under Alternative B, but more intensified as a reflection of the greater degree of change proposed under Alternative F. This would include changes proposed for the Quadrangle Building pavilions and Haupt Garden features, resulting in a greater cumulative adverse impact to those resources. However, Alternative F maintains the existing plain of the Quadrangle and Haupt Garden, mitigating the cumulative adverse impact of this alternative on the character and setting of the Castle and Haupt Garden, specifically.

Additionally, the greater degree of change proposed for the Hirshhorn Building Sculpture Garden and tunnel would result in a moderate cumulative adverse impact on the Hirshhorn Museum and Sculpture Garden.

VISUAL QUALITY

Construction projects from present and future projects, including the SW Ecodistrict, Monumental Core Framework Plan, National Mall Plan, Capitol Complex Master Plan, moveDC, Banneker Park Improvements, and the International Spy Museum have and would continue to have short-term impacts to the views and vistas in the area surrounding the South Mall Campus. The South Mall Campus Master Plan would be completed in phases. Any one particular phase could occur at the same time as the implementation for these other plans; therefore, the Master Plan Alternatives would add to the short-term adverse cumulative impacts to visual resources.

4.17.3.6 NO-ACTION ALTERNATIVE

The result of the lack of a coordinated approach to the protection, maintenance, and stabilization of cultural resources in the South Mall Campus—namely the Quadrangle, Castle, and Hirshhorn Museum buildings and the Hirshhorn Plaza and Sculpture Garden—would result in long-term cumulative adverse impacts.

4.17.3.7 ACTION ALTERNATIVES

Past and future projects such as the SW Ecodistrict Plan, Monumental Core Framework Plan, National Mall Plan, Museum of the Bible, the National Museum of Women’s History, Capitol Complex Master Plan, Comprehensive Plan for the National Capital and moveDC would have minor to moderate impacts to visual resources from permanent changes to views and vistas. To varying degrees the Master Plan Alternatives would contribute to the long-term cumulative impacts. The changes proposed under Alternative B would have a negligible potential for cumulative impacts to visual resources.

The greater degree of change proposed for Alternatives D and F would create minor to moderate cumulative impacts on visual resources on and around the South Mall Campus. In Alternatives D and F, altering the existing grades in the Haupt Garden and Hirshhorn Sculpture Garden would create moderate adverse impacts on the aesthetic character of these landscapes. These changes have been minimized in Alternative F by retaining the existing flat plane within the Haupt Garden.

LAND USE PLANNING AND POLICIES

The Federal and District Elements of the Comprehensive Plan, SW Ecodistrict Plan, Monumental Core Framework Plan, National Mall Plan, Capitol Complex Master Plan, the Center City Action Agenda, and the Banneker Park Improvements all seek to create a welcoming, well-connected, sustainable, and iconic capital city with the National Mall as its centerpiece. By enhancing

walkability, removing physical and visual barriers, and extending the civic qualities of the National Mall to the south, the South Mall Campus Master Plan would contribute to the goals common to these planning efforts. The Master Plan combined with other planning efforts in the area would attract more visitors, private developers, and residents over time, contributing to economic growth and vitality in the National Mall area and the District as a whole. Therefore, the Master Plan Alternatives would contribute to the long-term, moderate, beneficial, cumulative impacts to land use planning in the District.

TRAFFIC AND TRANSPORTATION

Construction projects from present and future projects, including the SW Ecodistrict, Monumental Core Framework Plan, National Mall Plan, Capitol Complex Master Plan, moveDC, NASM Revitalization, Eisenhower Memorial, NMNH Southside Improvements, Museum of the Bible, the National Museum of Women's History, Banneker Park Improvements, and the USDA Site Improvements would cause an increase in traffic on the local roadway network. When added to anticipated increases in traffic volumes from these projects, the minor increase in vehicular trips that would be generated by the implementation of the Master Plan would result in a cumulative, long-term, adverse impact to the local roadway network.

VISITOR USE AND EXPERIENCE

Construction projects from present and future projects, including the SW Ecodistrict, Monumental Core Framework Plan, National Mall Plan, Capitol Complex Master Plan, moveDC, NASM Revitalization, Eisenhower Memorial, NMNH Southside Improvements, Museum of the Bible, the National Museum of Women's History, Banneker Park Improvements, and the USDA Site Improvements have and would continue to have short-term impacts to the visitor use and experience in the area surrounding the South Mall Campus. The South Mall Campus Master Plan would be completed in phases. Any one

particular phase could occur at the same time as the implementation for these other plans; therefore, the Master Plan Alternatives would add to the short-term adverse cumulative impacts to visitor use and experience.

All of the plans and projects previously mentioned above and The Comprehensive Plan for the National Capital and the International Spy Museum cumulatively contribute to the overall visitor experience surrounding the National Mall by enhancing existing and/or creating new resources. However, additional visitation results in more intensive uses within the National Mall. Despite the disruption from construction activities and the increase in visitation, the overall cumulative impact of these past, present, and reasonably foreseeable future actions on visitor use and experience would be long-term and beneficial. The Master Plan Alternatives would contribute to the long-term beneficial cumulative impacts by enhancing the visitor use and experience to the Smithsonian's South Mall Campus.

HUMAN HEALTH AND SAFETY

Construction from present and future projects, including the SW Ecodistrict, Monumental Core Framework Plan, National Mall Plan, Capitol Complex Master Plan, moveDC, NASM Revitalization, Eisenhower Memorial, Banneker Park Improvements, NMNH Southside Improvements, and the USDA Site Improvements have and would continue to have the potential to expose visitors and construction personnel to safety hazards, including hazardous materials exposure, construction equipment, falling construction materials, etc., resulting in short-term impacts to human health and safety in the area surrounding the South Mall Campus. The South Mall Campus Master Plan would be completed in phases. Any one particular phase could occur at the same time as the implementation for these other plans; therefore, the Master Plan Alternatives would add to the short-term adverse cumulative impacts to human health and safety.

The Comprehensive Plan for the National Capital, SW Ecodistrict, Monumental Core Framework Plan, National Mall Plan, Capitol Complex Master Plan, moveDC, NASM Revitalization, and the USDA Site Improvements cumulatively contribute to the overall safety and security surrounding the National Mall by enhancing existing and/or adding new security measures. The overall cumulative impact of these past, present, and reasonably foreseeable future actions on human health and safety would be long-term and beneficial. The Master Plan Alternatives would contribute to the long-term beneficial cumulative impacts by enhancing blast protection, perimeter security, and visitor screening on the Smithsonian's South Mall Campus.

UTILITIES

Construction of present and future development projects near the South Mall Campus may temporarily disrupt utility service to neighboring properties, resulting in short-term, minor, adverse, cumulative impacts to users. The Master Plan Alternatives would potentially contribute to these temporary impacts.

The Federal and District Elements of the Comprehensive Plan, SW Ecodistrict Plan, National Mall Plan, Center City Action Agenda, and many other District plans and policies; and the NASM Revitalization, International Spy Museum, NMNH Southside Improvements, and the USDA Site Improvements include sustainability initiatives that would ultimately reduce demand for energy and water supplies and lessen the burden on utility providers in the region. The overall cumulative impacts of present and reasonably foreseeable future actions would be long-term and beneficial. By implementing energy efficiency and sustainability measures at the South Mall Campus, the Master Plan Alternatives would reduce energy and water usage and contribute to the long-term, beneficial, cumulative impacts to utilities.

WASTE MANAGEMENT

Construction of present and future development projects near the South Mall Campus would generate construction waste, which would be reclaimed or disposed of in landfills. The construction waste generated under the Master Plan Alternatives would contribute to the short- and long-term, adverse, cumulative impacts of construction waste, but the additional impacts would be negligible compared to the overall volume of waste generated in the area.

The Federal and District Elements of the Comprehensive Plan, SW Ecodistrict Plan, National Mall Plan, Center City Action Agenda, and many other District plans and policies; and the NASM Revitalization, International Spy Museum, NMNH Southside Improvements, and the USDA Site Improvements include waste reduction, recycling, and composting initiatives to divert as much waste as possible from landfills. The overall cumulative impacts of present and reasonably foreseeable future actions would be long-term and beneficial. By implementing recycling and composting initiatives on the South Mall Campus and diverting 80 percent of municipal waste from landfills, waste generated at the South Mall Campus would be reduced, contributing to the long-term, beneficial cumulative impacts to waste management.

4.18 ARE THERE ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES ASSOCIATED WITH THE MASTER PLAN?

The proposed Master Plan would require the removal of some character defining features of the cultural resources and landscapes that are a part of the South Mall Campus. The loss of such resources would be permanent and considered irreversibly committed. See Section 4.9 for the discussion of impacts to cultural resources.

The proposed Master Plan would require a commitment of fuel, including natural gas and energy which would be required to construct new facilities.

Other resource commitments during the construction period would include construction materials and labor. There would be an additional long-term commitment of labor for the maintenance of the central utility plant and infrastructure. In addition, once the facilities are in place, there is a commitment of utilities, fuel, and power. All of the resources relating to the maintenance of the South Mall Campus and its infrastructure are considered irretrievably committed.

While there would be the above commitment of resources, through conservation practices some of these resources, such as water supply, may be retrieved and reused in the Central Utility Plant and for irrigation purposes throughout the South Mall Campus. This would include the use of rain water to water the gardens throughout the South Mall Campus. In addition, it is assumed that once the Master Plan is fully executed a lower expenditure of energy and fuel than presently occurring on the South Mall Campus.

4.19 ARE THERE ANY ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED AS A RESULT OF THE PROPOSED PROJECT?

The environmental impacts for all of the Master Plan Alternatives, including the No-Action Alternative have been described in detail in the previous sections of this chapter. In general, there would be unavoidable adverse effects to soils, air quality, cultural and visual resources, traffic and transportation, visitor use and experience, and utilities. In all cases, SI would continue to work to minimize impacts and mitigate unavoidable impacts, as projects in the Master Plan are implemented.

4.20 WHAT RELATIONSHIPS EXIST BETWEEN THE LOCAL SHORT-TERM USES OF THE MASTER PLAN AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY?

The long-term benefits of the South Mall Campus Master Plan would occur at the expense of short-term impacts in the vicinity of the South Mall Campus. These short-term impacts would occur during the period of construction, and would include disruptions to the visitor experience, localized air pollution and minor delays in traffic from detours. However, these impacts are temporary and proper controls would be used to prevent these impacts from having a lasting effect on the human environment. Alternative F also offers alternate methods of phasing the projects in the Master Plan which could minimize construction disturbances in comparison to Alternative B and D.

Short-term gains to the local economy would occur as local companies and workers are hired and local businesses provide services and supplies during the construction or renovation of buildings. However, upon completion of the project, the gains to the local economy would evolve into a long-term benefit as the Master Plan is completed. Increased visitorship would occur by providing an integrated campus worthy of a world-class institution, which would provide consistent business to the South Mall Campus, other museums on the National Mall, and local businesses and merchants. In addition, there would be a greater

Furthermore, upon completion of the South Mall Campus Master Plan, there would be a long-term increase in energy efficiency because aging building systems would be replaced with newer, more efficient systems. While there would be a loss of some character defining features of cultural resources and landscapes, the Master Plan would allow for the long-term preservation of important historic resources, such as the Smithsonian Castle and the AIB



CHAPTER 5

REFERENCES



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