



4.0 Environmental Consequences

Environmental Consequences

4.1 INTRODUCTION

The National Environmental Policy Act of 1969 (NEPA) (40 CFR 1500-1508) dictates the completion of environmental impact statements for evaluation of the environmental impacts of proposed federal actions. The federal action under consideration in this study is the *Draft Jefferson National Expansion Memorial General Management Plan and Environmental Impact Statement*. The alternatives outlined in this document are intended to provide broad management direction for the Memorial. More detailed environmental documentation likely would be required as individual components of the plan are implemented.

The first portion of this chapter defines terminology and assumptions that are used in the impacts discussion that follows. The next two sections define and review cumulative impacts and impairment as they relate to the this plan for the Memorial. There is a subsequent explanation of how impacts to cultural resources and the analysis required by Section 106 of the National Historic Preservation Act (NHPA) are treated within this document. The following section defines the methodology employed in analyzing the impacts for each of the resource areas. Impacts are then examined by alternative: No Action, Program Expansion, Portals, and Park into the City. As required by NEPA, each alternative analysis culminates in a brief discussion of unavoidable adverse impacts, irreversible and irretrievable commitments of resources, and impacts on short-term uses and long-term productivity.

Terms and Assumptions

In the analysis that follows, impacts are characterized by several factors including intensity, type, duration, and context. Definition of these terms, and assumptions related to them, are provided below:

- *Intensity:* The intensity of an impact describes the magnitude of change that the impact generates. Thus, impacts are classified as negligible, minor, moderate, or major. Since definitions of these thresholds necessarily differ depending on the resource area, impact thresholds are defined separately for each topic.
- *Type:* The impact type refers to whether it is adverse (negative) or beneficial (positive). Adverse impacts are those that would deplete or harm resources. Beneficial impacts, by contrast, would improve resource conditions.
- *Duration:* The duration of an impact defines whether it is short-term, and thus occurs over a restricted period of time, or is long-term and persists over an extended period. For the purposes of this analysis, it is assumed that short-term impacts are those that would no longer be detectable after five years. Long-term impacts would still remain after five years' time.
- *Context:* The context of an impact defines whether it is local or regional. In this analysis, local impacts are those that are confined to the area immediately around the Memorial and the East St. Louis addition. Regional impacts are those that affect the larger St. Louis metropolitan area.

Direct, Indirect, and Cumulative Impacts

In addition to the four factors identified above, impacts may be characterized as direct, indirect, or cumulative. A direct impact is caused by the action and occurs at the same time and place. An indirect impact is caused by the action, occurs later in time or is farther removed in distance, but is still reasonably foreseeable. A cumulative impact is an “impact on the environment which results 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” (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

In order to assess potential cumulative impacts, recently completed, ongoing, and planned projects were identified within the area immediately surrounding the Memorial and the East St. Louis addition. These projects include:

- Ballpark Lofts (past, ongoing);
- Ballpark Village (planned);
- City Garden (ongoing);
- Federal Reserve Bank of St. Louis (completed);
- Hyatt Regency St. Louis Riverfront (ongoing);
- Old Post Office Plaza (ongoing);
- Roberts Tower (ongoing);
- The Bottle District (future); and
- Chouteau’s Landing (ongoing).

Impairment of Park Resources

In addition to assessing the environmental consequences of implementing the alternatives, National Park Service (NPS) management policies require that a determination be made as to whether actions would impair park resources. The fundamental purpose of

the National Park Service, as established by the 1916 Organic Act and reaffirmed by the General Authorities Act of 1970, mandates the conservation of park resources and values. The NPS managers always must seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values, when necessary and appropriate, to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. That discretion is limited, however, by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that would otherwise exist for the enjoyment of those resources and values. An impact to any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment if it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the park’s establishing legislation or proclamation;
- Key to the park’s natural or cultural integrity; or
- Identified as a goal in the park’s General Management Plan or other relevant NPS planning document.

The National Park Service has determined the following to be fundamental resources and values at Jefferson National Expansion Memorial:

- Jefferson National Expansion Gateway Arch and designed landscape – a National Historic Landmark (NHL) – integrated by a purposeful approach, scale, and aesthetic qualities, including the relationship to the river and to the Old Courthouse and the corresponding views.

- The Old Courthouse, site of the Dred Scott case and a tangible reminder of intangible concepts such as civil rights, citizenship, and freedom, as well as an innovative and outstanding example of mid-19th century civic architecture.
- The museum objects and archival records in the Memorial collection, vital to the interpretation and education of the visiting public on the topic of the westward expansion of the United States.
- The iconic, inspirational and transcendent nature of the Gateway Arch, as one of the unique and enduring symbols of national identity.

In addition to the Memorial’s fundamental resources and values, character-defining features and essential character-defining features have been identified for the Memorial’s landscape. These features, and the distinction between the two classifications, are discussed in Section 4.2. While the identification of the Gateway Arch and the Memorial grounds as fundamental resources and values necessitates their overall preservation, the identification of the Memorial’s character-defining features provides a detailed inventory of the key elements of the historic landscape.

In the impact analysis provided below, a determination of impairment is made within the conclusion section for each impact topic related to the Memorial’s cultural and natural resources. A determination of impairment is not required for impact topics such as visitor experience, regional socioeconomics, land use, transportation and access, and NPS operations.

Impacts to Cultural Resources and Section 106 of the NHPA

This study considers both impacts to cultural resources, as defined under NEPA and corresponding Council on Environmental Quality regulations, and effects to cultural resources as defined by the NHPA. In accordance with NEPA, impacts to historic buildings, structures, sites, objects, and districts; cultural landscapes; archeological resources; and curatorial resources and museum collections

identified within this document are characterized by their intensity, duration, context, and type, as discussed above. Thus, both adverse and beneficial impacts are identified for each of the alternatives.

In accordance with Section 106 of the NHPA, this study also assesses effects on cultural resources. Section 106 of the NHPA defines an “effect” as follows: “an undertaking has an effect on a historic property when the undertaking may alter the characteristics of the property that may qualify the property for the National Register” (36 CFR 800.5).

According to 36 CFR 800.5(a)(1), “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, are farther removed in distance, or are cumulative.

Adverse effects on historic properties include, but are not limited to:

- Physical destruction of or damage to all or part of the property.
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the *Secretary’s Standards for the Treatment of Historic Properties* (36 CFR part 68) and applicable guidelines.
- Removal of the property from its historic location.
- Changes in the character of the property’s use or of physical features within the prop-

erty's setting that contribute to its historic significance.

- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.
- Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an American Indian tribe or Native Hawaiian organization.
- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

If an undertaking is determined to have an adverse effect on properties included in, or eligible for, the National Register, the lead federal agency and the State Historic Preservation Officer (SHPO) enter into consultation to identify ways to avoid or reduce adverse effects. The Advisory Council on Historic Preservation and other interested parties can also participate in the consultation. Consultation typically results in a Memorandum of Agreement that stipulates the measures required to mitigate adverse effects and identifies the responsible parties and implementation schedule.

The Secretary of the Interior's Standards for Rehabilitation for the Treatment of Historic Properties are intended to promote preservation practices that protect important cultural resources. Treatments include preservation, rehabilitation, restoration, and reconstruction. Preservation suggests that measures are undertaken to stabilize the resource to ensure that it does not deteriorate further from its existing condition, and then to maintain and repair historic features and materials. Restoration focuses on the retention of materials from the most significant time in a property's history, while permitting the removal of materials from other periods. Reconstruction establishes limited opportunities to recreate a non-surviving site,

landscape, building, structure, or object in all new materials. According to the *Cultural Landscape Report for Jefferson National Expansion Memorial*, rehabilitation is the appropriate overall standard for the treatment of the Memorial landscape, buildings and structures, and features associated with the NHL. This treatment involves protecting and maintaining a cultural landscape's character-defining features and materials, but allowing for the replacement of extensively deteriorated, damaged, or missing features and for compatible new uses that do not radically change, obscure, or destroy character-defining spatial organization and land patterns or features and materials (NPS 1996b).

The Secretary's Standards for Rehabilitation are as follows:

- 1) A property will retain its historic use, or will appropriate a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.
- 2) The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
- 3) Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.
- 4) Changes to a property that have acquired historic significance in their own right will be retained and preserved.
- 5) Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.
- 6) Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be

substantiated by documentary and physical evidence.

- 7) Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
- 8) Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
- 9) New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old, and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
- 10) New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment will be unimpaired.

These standards have been clarified for landscapes through the *Guidelines for the Treatment of Cultural Landscapes* (NPS 1996b). The guidelines illustrate how to apply the four treatment standards of preservation, restoration, reconstruction, and rehabilitation to cultural landscapes in a way that meets the National Park Service's standards. This document was referenced both in the development of the CLR for the Memorial, as well as in the analysis that follows within *Jefferson National Expansion Memorial General Management Plan and Environmental Impacts Statement*.

4.2 METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

Cultural Resources

Chapter 3 established that historic buildings, structures, sites, objects and districts; cultural landscapes; archaeological resources; and

curatorial resources and museum collections would be analyzed in detail in this environmental analysis.

HISTORIC BUILDINGS, STRUCTURES, SITES, OBJECTS AND DISTRICTS, AND CULTURAL LANDSCAPES

Historic buildings, structures, sites, objects, districts, and cultural landscapes listed in the National Register were identified. For each of the alternatives, a determination was made regarding adverse effect. In addition, thresholds were defined to identify the intensity of impacts to historic structures and cultural landscapes under NEPA. These thresholds are as follows:

- *Negligible*: The impact does not result in any noticeable changes to the resource or its visual context. For the purposes of Section 106, the determination of effect would be no adverse effect.
- *Minor*: A minor adverse impact occurs when there are visible changes to the resource or its visual context, but there is no affect on the resource's character-defining features or integrity. For the purposes of Section 106, the determination of effect would be no adverse effect. A minor beneficial impact occurs when the historic resource is maintained and stabilized. For the purposes of Section 106, the determination of effect would be no adverse effect.
- *Moderate*: A moderate adverse impact results in a change in one or more of the resource's character-defining features, but would not diminish the integrity of the resource to the extent that its National Register eligibility would not be lost. For the purposes of Section 106, the determination of effect would be adverse effect. A moderate beneficial impact results in the preservation or rehabilitation of character-defining features, and thus improves the integrity of the design. For the purposes of Section 106, the determination of effect would be no adverse effect.
- *Major*: A major adverse impact results in changes to essential character-defining features such that it could compromise the integrity of the resource to the extent that it

would no longer be eligible for listing in the National Register. For purposes of Section 106, the determination of effect would be adverse effect. A major beneficial impact occurs when essential character-defining features are preserved or rehabilitated, and thus substantially improve the integrity of the design. For the purposes of Section 106, the determination of effect would be no adverse effect.

The thresholds defined above distinguish between character-defining features and essential character-defining features. While the landscape features outlined in Chapter 3 all contribute to the historic significance of the Memorial, some features are more critical to the integrity of the NHL.

Mary Hughes, in her article “Dan Kiley’s Site Design for the Gateway Arch,” provides clarification as to what constitutes an essential element of the Memorial landscape. She writes: “It is the overall concept that is of paramount importance on the ninety-one acre site: the circulation system that reflects the gentle curvature of the Arch, the spatial quality of open lawn areas framed by dense tree plantings, the views of the Arch structured by the plantings and reflected in the lagoons, the grading that subtly screens the railroad line and service functions, and the bold simplicity of the planting plan through use of a single dominant species to reinforce the geometry of the walks” (Hughes 1999). As such, the preservation and rehabilitation of these elements is essential to maintaining the integrity of the NHL.

ARCHEOLOGICAL RESOURCES

Archeological resources are non-renewable. Once an impact occurs, the effect is irreversible and permanent; therefore duration is not identified within this analysis. Any impacts to historical archeological resources are assumed to be local to the historic downtown St. Louis area, unless identified as regional within the analysis. Any effects to prehistoric archeological resources are assumed to have regional impacts, unless otherwise identified in the analysis in this document.

A number of resources were used to analyze impacts to archeological resources. These are

discussed in Chapter 3 and include reports on past archeological investigations within the Memorial grounds as well as records kept by the SHPO of investigations in the immediate vicinity. Although these investigations provide some information on the potential for archeological materials to be present, they do not cover the entire project area and can only be used as predictive tools.

Thresholds describing the severity of potential impacts to archeological resources resulting from the proposed alternatives were developed for the impact analysis. Both adverse and beneficial impacts may occur due to the proposed alternatives. Adverse impacts result from the disruption or displacement of archeological resources as a result of earthmoving activities, soil compaction, and related ground disturbing activities associated with construction and planting efforts. Beneficial impacts are those that better protect an archeological resource as a result of changes in patterns of visitor use or management action.

The impact thresholds developed for the discussion of archeological impacts are as follows:

- *Negligible*: The impact is barely measurable, with no perceptible adverse or beneficial consequences.
- *Minor*: A minor adverse impact affects archeological sites with the potential to yield important information in prehistory or history. Impacts are detectable and measurable, but do not diminish the overall integrity of the resource. The impact does not result in changes to defining features or aspects of integrity that contribute to eligibility to the National Register. For purposes of Section 106, the determination of effect is no adverse effect. A minor beneficial impact maintains and preserves an archeological resource. Impacts are measurable and localized. For purposes of Section 106, the determination of effect is no adverse effect.
- *Moderate*: A moderate adverse impact is sufficient to cause a noticeable change, substantially affecting archeological sites with the potential to yield information, even if most of the resource can be avoided, and

resulting in loss of overall integrity that consequently jeopardizes a site's National Register eligibility. Impacts include measurable change to character-defining elements. For purposes of Section 106, determination of effect is adverse effect. A moderate beneficial impact is measurable, with the stabilization of currently threatened sites serving as an example. For purposes of Section 106, determination of effect is no adverse effect.

- *Major:* A major adverse impact consists of highly noticeable disturbance, degradation, or destruction of an archeological resource, and results in the loss of most or all of the site and its potential to yield important information. These impacts result in the loss of overall integrity and substantial changes to character-defining elements to the extent that the resource is no longer eligible for National Register listing. For the purposes of Section 106, the determination of effect is adverse effect. A major beneficial impact consists of active intervention undertaken to preserve a site. Effects are measurable and contribute to the overall stability of the site. For purposes of Section 106, the determination of effect is no adverse effect.

CURATORIAL RESOURCES AND MUSEUM COLLECTIONS

Museum collections are a critical element of the Memorial. Within this analysis, short-term impacts are defined as those that would result from the movement of the resources from one location to another. Long-term impacts are defined as those impacts that would result from ongoing conditions or treatment of the resources. It is assumed that all impacts are local and confined to collections housed within the Memorial. Collections housed within other repositories in St. Louis are not considered in the subsequent analysis. The thresholds determining the intensity of impacts on curatorial resources and museum collections are as follows:

- *Negligible:* There is no noticeable change in the condition or treatment of resources, nor is there an increase in the number of resources on display or housed within Memorial collections.

- *Minor:* A minor adverse impact occurs when there is a slight but noticeable degradation of the condition or treatment of resources; and/or there is a slight decrease in the number of resources on display or housed within Memorial collections. A minor beneficial impact occurs when there is a slight but noticeable improvement in the condition or treatment of resources; and/or there is a slight increase in the number of resources on display or housed within Memorial collections.
- *Moderate:* A moderate adverse impact occurs when the degradation of the condition or treatment of resources is highly noticeable; and/or there is a modest decline in the number of resources on display or housed within Memorial collections. A moderate beneficial impact occurs when improvements to the condition or treatment of resources is highly noticeable; and/or there is a modest increase in the number of resources on display or housed within Memorial collections.
- *Major:* A major adverse impact occurs when the degradation in the condition or treatment of resources is severe, resulting in the loss of a substantial portion of the Memorial's collections; and/or there is a substantial decrease in the number of resources on display or housed within Memorial collections. A major beneficial impact occurs when the improvement in the condition or treatment of resources is exceptional, resulting in the long-term preservation of a substantial portion of the Memorial's collections; and/or there is a substantial increase in the number of resources on display or housed within Memorial collections.

Natural Resources

Potential natural resource impacts from the action and no action alternatives have been evaluated, including impacts on vegetation, threatened and endangered species, and soundscapes. The evaluation of impacts was based on interpretation of the data collected from numerous reports and regulatory documents, discussions with resource agency

personnel, site visits, and geographic information system (GIS) data analysis.

VEGETATION

Visitor use and construction activities can impact vegetation through a number of mechanisms. Direct impacts include trampling and removal of vegetation when walking off pathways or clearing vegetation as part of site preparation and construction. A single trampling event might adversely impact one or more individuals of a species. Repeated trampling of the vegetation along a path can lead to changes in the vegetation and habitat alteration. Soil compaction from the use of heavy machinery or repeated trampling can also indirectly impact vegetation communities on the site.

Introduction or spread of invasive species can also result from visitor use, landscape management and maintenance practices, and construction activities. Establishment of invasive species often results in changes to both the plant and wildlife composition of the infested area. Visitors may unwittingly introduce or spread propagules (e.g., seeds) of invasive species by picking clinging seeds off of shoes or clothing. Many commonly used plants, including those used on the Memorial grounds (such as English ivy), are also invasive. Construction equipment, if not properly cleaned between job sites, is another primary means of spreading invasive species.

Impacts on vegetation communities were evaluated by comparing projected changes resulting from the action alternatives with the no action alternative. The impacts of potential visitation increases have been factored into the analysis.

The thresholds to determine impacts on vegetation are defined as follows:

- *Negligible*: Impacts are barely detectable and/or affect a minimal area of vegetation.
- *Minor*: Impacts are slight, but detectable, and/or affect a small area of vegetation. The severity and timing of changes are not expected to be outside natural variability spatially or temporally. Key ecosystem

processes and community structure are retained at the local level.

- *Moderate*: Impacts are readily apparent and/or affect a large area of vegetation. The severity and timing of changes are expected to be outside natural variability spatially and/or temporally; however, key ecosystem processes and community structure are retained at the regional level.
- *Major*: Impacts are severely adverse or exceptionally beneficial and/or affect a substantial area of vegetation. The severity and timing of changes are expected to be outside natural variability both spatially and temporally. Key ecosystem processes and community structure may be disrupted.

THREATENED AND ENDANGERED SPECIES

Impacts to federally listed or candidate species were evaluated by comparing projected changes resulting from the action alternatives to existing conditions. These evaluations were based on potential occurrences of Threatened and Endangered species within the East St. Louis addition, the distribution of their preferred habitats within these areas, and the distribution of any designated critical habitat. The impacts of potential visitation increases have been factored into the analysis. The federally designated Threatened species addressed in this document is the decurrent false aster (*Boltonia decurrens*).

Impact thresholds for the addressed federally listed or candidate species are defined based on USFWS Section 7 impact terminology as follows:

- *No Effect*: This means there are absolutely no effects to the species or its critical habitat, either positive or negative. A no-effect determination does not include effects that are unlikely to occur. If effects are insignificant (in size) or discountable (extremely unlikely), a determination of not likely to adversely affect is appropriate.
- *Not Likely to Adversely Affect*: This means that all effects to the species or its critical habitat are beneficial, insignificant, or discountable. Beneficial effects have

contemporaneous positive effects without adverse effects to the species. Insignificant effects relate to the size of the impact and should not reach the scale where a taking occurs. Discountable effects are considered extremely unlikely to occur. Determinations of not likely to adversely affect, due to beneficial, insignificant, or discountable effects typically require written concurrence from the USFWS.

- *Likely to Adversely Affect:* This means that an adverse effect to the species or its critical habitat may occur as a direct or indirect result of an action, and the effect is not discountable, insignificant, or beneficial. In the rare event that adverse effects cannot be avoided, the project would either be discontinued or NPS staff would request formal consultation with the USFWS.

SOUNDSCAPE

The impacts of each alternative on the soundscape of the Memorial were assessed qualitatively by evaluating the noise generated from construction, noise generated from the operation of various plan components, and the noise reduction potential of certain design elements such as the construction of the three-block lid over Interstate 70 (I-70).

Within this analysis, it is assumed that the construction contractor would manage construction operations to comply with local noise ordinances and restrictions at all times, and that the majority of construction activities would occur between 7:00 a.m. and 7:00 p.m., Monday through Friday.

The thresholds to determine the level of impact on noise are defined as follows:

- *Negligible:* The noise generated during construction or operation is not discernable above background noise levels.
- *Minor:* The noise generated during construction or operation is sometimes discernable above background noise levels.
- *Moderate:* The noise is readily apparent and/or is easily discernable by users of the Memorial grounds above background noise

levels, but remains below levels established by regulatory guidelines. The effects are primarily local; however, noise is periodically noticeable offsite.

- *Major:* The noise generated by the construction or operation of the proposed elements exceeds levels established by regulatory guidelines, greatly impacts users' enjoyment of the Memorial grounds, or is frequently noticeable offsite.

Unless otherwise noted, all impacts on the soundscape are assumed to be local impacts that affect only the immediate area of the noise source. No impacts on the regional soundscape are anticipated from any of the proposed alternatives.

Visitor Opportunities and Use

Impacts on visitor opportunities including recreation and interpretive experiences, access, and scenic resources, were evaluated by comparing projected impacts from the action alternatives to the no action alternative. These evaluations included consideration of the Memorial's purpose, significance, fundamental resources and values, and what contributes or detracts from desirable visitor opportunities.

Changes in annual visitor use may be affected by management zoning, visitor opportunities, changing economic conditions, construction projects, and other aspects of the various alternatives. Differences and uncertainties about when specific actions might occur provide a limited basis upon which to project changes in visitor use over time. Consequently, the approach to projecting visitor use relies on the professional judgment of the NPS staff and their assessment of the effects of changes in opportunities, capacities, activities, and promotion or discouragement of use. Estimates of future visitor use are not intended to be predictive or absolute, but rather to provide a means of comparing the likely relative order in visitation changes under each alternative.

Impacts to visitor use and/or experience may be beneficial, adverse, or indeterminate. Beneficial impacts are those that many indi-

viduals or groups would accept or recognize as improving visitor use and/or experience in general or for a specific group of people. Adverse impacts are those that most individuals or groups would accept or generally recognize as diminishing visitor use and/or experience, either in general or for a specific group of people. Indeterminate impacts are those for which the size, timing, location, individuals, or groups that would be impacted cannot be determined, or those that include both beneficial and negative effects, in some instances affecting different communities, populations, public entities, or jurisdictions such that the net effect is indeterminate.

The thresholds for this impact topic are as follows:

- *Negligible:* Visitors would likely be unaware of any effects associated with implementation of the alternative. There would be no noticeable change in visitor use and experience or in any defined indicators of visitor satisfaction or behavior.
- *Minor:* Changes in visitor use and/or experience would be slight though detectable, but would not appreciably enhance or diminish critical characteristics of the visitor experience. Visitor satisfaction would remain stable.
- *Moderate:* Few critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be altered. The visitor would be aware of the effects associated with implementation of the alternative and would likely be able to express an opinion about changes. Visitor satisfaction would begin to either decline or increase as a direct result of the effect.
- *Major:* Multiple critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be greatly reduced or increased. The visitor would be aware of the effects associated with implementation of the alternative and would likely express a strong opinion about the change. Visitor satisfaction would markedly decline or increase

Transportation and Access

The Memorial is near numerous modes of transportation that provide local and regional access and strongly shape the visitor experience. Future management alternatives for the Memorial may lead to changes to the various transportation resources that serve it. These changes may incur impacts in several ways. Any alterations to the way visitors arrive, exit, or move through the Memorial would have an impact on the transportation resource.

In determining whether an impact to the transportation resource is adverse or beneficial, the critical criterion is how the change influences the visitor's experience. Therefore, traditional quantitative means for assessing transportation-related systems, such as Level of Service, are not applicable within the context of this plan. Rather, starting from the perspective of the visitor experience, this plan measures the impacts to transportation in a qualitative manner, considering how well they meet context-sensitive solutions.

The following thresholds measure the impacts of the management alternatives on the transportation resources of the Memorial:

- *Negligible:* The impact is barely detectable and/or results in no measureable or perceptible change to the transportation resource.
- *Minor:* The impact is slight but detectable and/or results in small but measurable changes to the transportation network either within the Memorial or adjacent to it; the affect is localized to the Memorial or adjacent transportation networks.
- *Moderate:* The impact is readily apparent and/or easily detectable to visitors to the Memorial grounds. However, the affects primarily occur within one-quarter mile of the Memorial.
- *Major:* The impact affects both the transportation network adjacent to the Memorial as well as the regional transportation system. A major adverse impact occurs if changes generated by the construction or operation of additional projects lead to significant failure, without remediation, of particular modes of transportation

or significantly alter/degrade the flow of people and goods in the region.

Socioeconomics

In the socioeconomic impact analysis, the economic contributions of the Memorial, as well as population, employment, income and poverty are combined under the discussion of socioeconomics. The analysis of land use impacts is discussed separately.

SOCIOECONOMICS

The Memorial has been and remains a very important visitor destination and symbol for the City of St. Louis. Proposed changes in the management of the Memorial could impact regional socioeconomics, and are a matter of keen public interest. Potential economic impacts include changes in local employment and income resulting from changes in visitor use and spending. In addition, modification in the NPS operations could have indirect impacts on the local economy and government revenue. However, it was concluded early in the planning process that alternative management schemes would not impact certain social parameters such as population, demographics, or environmental justice.

The analytical approach to evaluating economic impacts focused on two factors:

- Changes to visitor use and spending.
- Changes in the NPS budgets and staffing to administer, maintain, restore and support new construction projects under each alternative.

Total annual visitation has averaged three million visitors per year. However, when evaluating local economic impacts from Memorial grounds visitation, the analysis focuses on new expenditures in the local economy. To account for this, the analysis excluded visitation due to special events and parking-only patrons because these individuals are likely to be local residents that are not introducing new expenditures to the area. Thus, the economic analysis considered current annual visitation to be 1.8 million visits per year.

Management guidance and zoning established under the *Draft Jefferson National Expansion Memorial General Management Plan and Environmental Impact Statement* is expected to attract higher visitor use under all of the action alternatives, as compared to the no action alternative. This assumption is based on the goals of each alternative to improve, enhance or develop facilities and activities available to visitors, improve connections with other parts of St. Louis and improve access into and throughout the Memorial.

Estimates of future visitor use are not intended to be predictive, but instead representative of the relative order of magnitude of increases to visitor use over time. Actual changes in visitor use would depend on a number of factors, many outside the control of the National Park Service, including general economic conditions at the regional and national levels.

Estimated implementation costs of the alternatives to operate and maintain the Memorial were based on current budgets. Actual future budgets would reflect future NPS policies, actual conditions, unanticipated events and opportunities, as well as Congressional approval of the NPS budgets. The information on visitor expenditures and the NPS operations was used in combination with the regional economic impact model to estimate changes in employment and income.

Thresholds were developed to assess the magnitude of socioeconomic impacts resulting from the alternatives under consideration. In the development of these thresholds, it was assumed that beneficial impacts are those that many individuals or groups would accept or recognize as improving economic conditions, either in general or for a specific group of people, businesses, organizations, or institutions. Examples of beneficial effects include lower unemployment, higher personal income, increases in economic diversity and sustainability. Adverse impacts are those that most individuals or groups would generally recognize as diminishing economic welfare, either in general or for a specific group of people, businesses, organizations, or institutions. Examples of adverse effects include fewer job

opportunities and increases in the cost of living without matching increases in higher income.

The following thresholds were used to determine the magnitude of impacts on socioeconomics:

- *Negligible:* Very few individuals, businesses, or government entities are impacted. Impacts are nonexistent, barely detectable, or detectable only through indirect means and with no discernible impact on regional economic conditions.
- *Minor:* A few individuals, businesses, or government entities are impacted. Impacts are small but detectable, limited to a small geographic area, comparable in scale to typical year-to-year or seasonal variations, and not expected to substantively alter economic conditions over the long term.
- *Moderate:* Many individuals, businesses, or government entities are impacted. Impacts are readily apparent and detectable across a wider geographic area, and may have noticeable effect on economic conditions over the long term.
- *Major:* A large number of individuals, businesses, or government entities are impacted. Impacts are readily detectable and observed, extend across much of the study area, and have substantial influence on economic conditions over the long term.

LAND USE

Jefferson National Expansion Memorial is an important visitor destination and symbol of the City of St. Louis. The 91 acres occupied by the Memorial are a focal point for the city in many ways. This section evaluates how planned policies and actions under each alternative may affect area land use, particularly in light of the Memorial's location within an active urban corridor and its significance as an urban green space.

In evaluating potential impacts to land use, it is essential to examine the physical context of the Memorial – an urbanized area in the heart of downtown St. Louis. The site is bordered by major transportation routes and the Mississippi River. Relevant land use plans,

including those published by the National Park Service, the City of St. Louis, and private developers, were evaluated to determine the interaction between these plans and land use at the Memorial. The plans considered include:

- St. Louis Strategic Land Use Plan;
- St. Louis Gateway Mall Master Plan;
- East St. Louis, IL Comprehensive Plan;
- St. Louis Downtown Development Action Plan;
- Legacy 2035;
- St. Louis Downtown Access, Circulation, and Traffic Study; and
- Ball Park Village.

Thresholds were developed to assess the magnitude of land use impacts resulting from the alternatives under consideration. Beneficial impacts are those that would improve land use or values in general or for a specific group of people, businesses, organizations, or institutions. Adverse impacts are those that would diminish land use or values, either in general or for a specific group of people, businesses, organizations, or institutions.

The following thresholds were used to determine the magnitude of impacts on land use:

- *Negligible:* Very few individuals, businesses or government entities are impacted. Impacts are nonexistent, barely detectable, or detectable only through indirect means and with no discernible impact on land use.
- *Minor:* A few individuals, businesses or government entities are impacted; however, impacts to land use and values are minimal, though detectable. Mitigation measures, if needed to offset adverse effects, are simple and successful.
- *Moderate:* Many individuals, businesses or government entities are impacted. Impacts result in a change to land use and values that are readily detectable, measurable, and consequential. Mitigation measures, if

needed to offset adverse impacts, may be extensive, though likely successful.

- *Major:* A large number of individuals, businesses or government entities are impacted. Impacts result in a change to land use and values that have substantial consequences. Extensive mitigation measures are needed to offset any adverse impacts, and their success is not guaranteed.

National Park Service Operations

This impact topic refers to the ability of the NPS staff to protect and preserve Jefferson National Expansion Memorial resources, and to provide opportunities for effective and enjoyable visitor experiences. It also addresses the effectiveness and efficiency with which the NPS staff are able to perform such tasks. Information about the NPS operations was compiled from various sources, including the Memorial's managers and other staff. Information gathered includes Memorial staffing, maintenance, and expense records, business plans, annual reports, volunteer records, and other documents. Operational considerations include the needs of the Ranger Activities, Museum Services and Interpretive, Maintenance, and Administrative Divisions, as well as the Volunteers in the Park and current partnerships/associations.

The following thresholds measure the impacts of the management alternatives on the NPS operations at the Memorial:

- *Negligible:* Effects on the existing NPS operations would be at or below the level of detection.
- *Minor:* Effects on the existing level of NPS operations would be small but detectable. The change would be noticeable to staff but probably not to the public.
- *Moderate:* Effects on the NPS operations would be readily apparent to staff and possibly to the public.
- *Major:* Effects on the NPS operations would be substantial, widespread, and apparent to staff and the public.

4.3 CURRENT MANAGEMENT ALTERNATIVE – NO ACTION

Cultural Resources

HISTORIC BUILDINGS, STRUCTURES, SITES, OBJECTS, AND DISTRICTS

ANALYSIS OF DIRECT AND INDIRECT IMPACTS As it has for more than 40 years, the 1962 Conceptual Master Plan would continue to guide park managers, upholding the current management approach at the Memorial. The National Park Service would continue to look for opportunities to complete unfinished portions of the original Memorial design, contingent on project approval and funding. The preservation of the NHL and the fundamental resources and values of the Memorial would remain of paramount importance.

Under the no action alternative, all historic structures within the Memorial would be maintained in their current condition. The roof at the Old Courthouse, which currently leaks, would not be repaired until funding is available. Over time, this could result in the degradation of the building's historic fabric and thus minor to moderate long-term local adverse impacts. In addition, repairs and maintenance of site walkways, benches, and plantings would be accomplished; however, these actions would only have negligible local short- and long-term indirect impacts on historic buildings, structures, sites, objects, and districts. The no action alternative would not directly or indirectly impact resources located outside of the Memorial boundary. If the Old Courthouse roof is not replaced, over time this could result in an adverse effect under Section 106. There would be no adverse effects on other buildings, structures, sites, objects, or districts located on the Memorial grounds or within the APE as a result of the no action alternative.

ANALYSIS OF CUMULATIVE IMPACTS As detailed above, there could be minor to moderate long-term local adverse impacts to the Old Courthouse. These impacts, when considered together with projects planned or ongoing within the surrounding area, would not contribute to cumulative impacts to

historic buildings, structures, sites, objects or districts.

CONCLUSION AND IMPAIRMENT FINDING

The implementation of the no action alternative would result in minor to moderate long-term local adverse impacts to the Old Courthouse if the building's roof is not repaired or replaced. Short-term, long-term, and cumulative impacts to other historic buildings, structures, sites, objects and districts would be local and negligible. The potential deterioration of the Old Courthouse due to the leaking roof could result in an adverse effect under Section 106, but the National Park Service would address the deficiency before the condition constituted an adverse effect leading to impairment.

CULTURAL LANDSCAPES

ANALYSIS OF DIRECT AND INDIRECT

IMPACTS Under the no action alternative, the 1962 Conceptual Master Plan would continue to guide the management of the Memorial. The National Park Service would continue to look for opportunities to complete unfinished portions of the design, contingent on project approval and funding. All actions impacting the Memorial's historic landscape would be undertaken in consultation with the Missouri SHPO. Ultimately, the preservation of the NHL and the fundamental resources and values of the Memorial would be of paramount importance.

The appearance of the Memorial grounds would remain largely unchanged, and the landscape features contributing to the historic character of the Memorial would be preserved. There would be no changes to the topography of the site, surrounding land uses, natural features, viewsheds, and water features. The spatial organization of the Memorial – including the combination of open monumental spaces and enclosed, human-scale spaces – and the critical viewsheds are of paramount importance to the integrity of the cultural landscape. These elements would largely be unchanged. Over time, repairs and maintenance of site walkways, benches, and plantings would be accomplished, resulting in

minor to moderate long-term local beneficial impacts. Overall, there would be no adverse effect to the Memorial's cultural landscape as a result of the no action alternative.

ANALYSIS OF CUMULATIVE IMPACTS

Under the no action alternative, there may be minor to moderate long-term beneficial impacts to the cultural landscape of the Memorial. These impacts, when considered together with projects planned or ongoing within the surrounding area, would not contribute to cumulative impacts to this historic resource.

CONCLUSION AND IMPAIRMENT FINDING

Overall, short-term, long-term, and cumulative impacts to cultural landscapes would be minor to moderate, beneficial and local. Under Section 106, there would be no adverse effect on the Memorial landscape. In addition, there would be no impairment of the historic landscape as a result of the no action alternative.

ARCHEOLOGICAL RESOURCES

ANALYSIS OF DIRECT AND INDIRECT

IMPACTS Under the no action alternative, ground disturbances may occur if streetscape improvements are undertaken along the roadways that border the Memorial.

Most of these improvements are likely to occur within previously disturbed contexts of existing streets, and have a low likelihood of impacting intact archeological resources. However, intact archeological features are more likely to be encountered in the area of improvements in Luther Ely Smith Square and along the riverfront, where the original ground surface generally coincides with the current ground surface. If archeological resources are encountered during ground disturbance, the disturbances proposed under the no action alternative would be addressed by the NPS standard operating procedures, which encourage preservation through avoidance. Under the no action alternative, there could be negligible, local and regional, long-term adverse impacts and no adverse effects under Section 106.

ANALYSIS OF CUMULATIVE

IMPACTS Cumulative impacts would occur from the incremental impact of this alternative when added to other past, present, and foreseeable future actions. The geographic area that was considered for cumulative impacts on this alternative consists of historic downtown St. Louis. Under this alternative, however, the National Park Service would control all activities according to their standard operating procedures, which encourage preservation of archeological sites. Therefore, there would be continued preservation and no cumulative impact to archeological resources under this alternative.

CONCLUSION AND IMPAIRMENT FINDING

The no action alternative would consist of minor to moderate ground disturbances resulting in negligible, local and regional, long-term adverse impacts to archeological resources. There would be no cumulative impacts. Under Section 106, there would be no adverse effects to archeological resources. In addition, there would be no impairment to archeological resources as a result of the no action alternative.

CURATORIAL RESOURCES AND MUSEUM COLLECTIONS

ANALYSIS OF DIRECT AND INDIRECT

IMPACTS Under the no action alternative, those portions of the collection on display would continue to be housed as they are in the Museum of Westward Expansion and the Old Courthouse. The balance would still be housed in the dedicated collections room in the Old Courthouse. Current space, access, electrical and HVAC limitations would continue. Water incursions into the space may occur in the future. Thus, there would be minor to moderate long-term local adverse impacts to curatorial resources and museum collections.

ANALYSIS OF CUMULATIVE IMPACTS

Under the no action alternative, there would be minor to moderate long-term local adverse impacts to curatorial resources and museum collections. These impacts, when considered together with projects planned or ongoing within the surrounding area, would not

contribute to cumulative impacts to museum collections.

CONCLUSION AND IMPAIRMENT FINDING

Overall, short-term, long-term, and cumulative impacts to curatorial resources and museum collections would be minor to moderate, adverse and local. There would be no impairment of curatorial resources and museum collections as a result of the no action alternative.

Natural Resources

VEGETATION

ANALYSIS OF DIRECT AND INDIRECT

IMPACTS Under the no action alternative, the Memorial grounds would continue to function much the way it does today and management of the site would remain unchanged. Management of vegetation communities at the East St. Louis addition would remain unchanged. There would be no direct impacts due to trampling or removal of vegetation at any of these locations; nor would any secondary impacts from soil compaction associated with construction equipment occur. Negligible long-term impacts from the spread of invasive species would continue since much of the vegetation community on the east side of the river already consists of invasive species.

ANALYSIS OF CUMULATIVE IMPACTS

Past land use practices have completely removed the original forested land cover of the St. Louis/East St. Louis area and created the urban/developed land cover that exists today. Since the no action alternative would have no additional impacts on vegetation, there would be no cumulative impacts to vegetation communities as a result of this alternative.

CONCLUSION AND IMPAIRMENT FINDING

Under the no action alternative, there would be no new construction or change to management or maintenance policies within the study area and no cumulative impacts to vegetation communities. There would be no impairment of Memorial resources.

THREATENED AND ENDANGERED SPECIES

ANALYSIS OF DIRECT AND INDIRECT IMPACTS Under the no action alternative, no changes to management practices, site uses, or available habitat would occur. The federally designated threatened decurrent false aster is present on the east bank of the Mississippi River below the levee. Current conditions apparently provide favorable habitat; favorable conditions for this species would remain.

ANALYSIS OF CUMULATIVE IMPACTS None of the projects considered as part of the cumulative impacts analysis are located on the east side of the river where the current local population of decurrent false aster is present. Thus, there would be no cumulative impacts to the decurrent false aster resulting from the no action alternative.

CONCLUSION AND IMPAIRMENT FINDING Since there would be no additional development, loss of habitat, or changes in maintenance or management practices that may disturb decurrent false aster populations on the east side of the river, there would be no impact to this threatened species and no impairment of Memorial grounds resources within the study area.

SOUNDSCAPE

ANALYSIS OF DIRECT AND INDIRECT IMPACTS There would be minor, short-term noise impacts from the construction of the pedestrian enhancements and streetscape improvements at the Memorial. There would be continuing minor long-term noise impacts from the existing maintenance-related activities on the Memorial grounds, including lawn mowing and testing of the emergency generators. Due to the infrequent nature and the short duration (typically less than one day) of special events on the Memorial grounds, the impacts to the soundscape of the Memorial from special events would be considered minor. There would be no new noise-generating activities on the East St. Louis addition.

ANALYSIS OF CUMULATIVE IMPACTS There would be minor short- and long-term adverse

impacts to noise under the no action alternative. These impacts, when considered together with recently completed, ongoing, and planned projects within the study area, would not contribute to cumulative impacts to this resource.

CONCLUSION AND IMPAIRMENT FINDING The no action alternative could result in minor short-term adverse impacts to noise from construction activities associated with pedestrian and streetscape improvements at the Memorial. There would also be continuing minor long-term adverse noise impacts from the existing maintenance activities. There would be no impairment of the soundscape of the Memorial from this alternative.

Visitor Opportunities and Use

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Visitor opportunities would largely remain the same at the Memorial as they are today under the no action alternative. Visitors would continue to have access to heritage programs and educational activities at the Museum of Westward Expansion and the Old Courthouse. Additionally, visitors would continue to have access to recreational activities on the Memorial grounds. Without changes to facilities and programs, it is expected that most visitors would come to the Memorial to ride the tram and spend approximately two hours at the site while other facilities would remain underutilized (e.g., the museum and Old Courthouse). Impacts to visitor opportunities are expected to be negligible under the no action alternative, as visitors would not discern any changes in opportunities with implementation of the alternative.

Implementation of the no action alternative is expected to have moderate adverse long-term local impacts on visitor opportunities and use. Some visitors would continue to be adversely impacted by a lack of barrier-free and Americans with Disabilities Act/Architectural Barriers Act Accessibility Standard (ADA/ABAAS)-compliant access to the Memorial. Self-directed educational opportunities would remain limited due to the absence of wayside exhibits throughout the Memorial. The Memorial would continue to attract one-time

users (or return visitors after several years) without modernizing exhibits and opportunities throughout the Memorial grounds, including the introduction of new technology.

ANALYSIS OF CUMULATIVE IMPACTS

The no action alternative would result in moderate long-term adverse impacts to visitor opportunities and use. These impacts, when considered together with ongoing or planned projects within the study area, would not contribute to a cumulative impact to visitor opportunities and use.

CONCLUSION

The no action alternative is expected to have a moderate adverse long-term local impact on visitor experience and use. With a lack of barrier-free access points to the Memorial, some visitors are discouraged from visiting the site. In addition, without any modification or rehabilitation to exhibits and education programs such as the introduction of new technology, it is expected that visitors would continue to come to the Memorial mainly for the tram ride and would fail to utilize other facilities (museum and Old Courthouse). This management action would be expected to continue to attract one-time visitors (or repeat visitors after several years). Unfriendly streetscapes to and from the Memorial into downtown would be expected to have a long-term adverse impact on visitor experience, as visitors would be less likely visit other downtown attractions. In addition, some local residents and employees would be less likely to visit the Memorial.

Transportation and Access

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

In the no action alternative, no changes would occur to the roadway network surrounding the Memorial. Thus, impacts would be negligible.

Under the no action alternative, current public transportation conditions would continue in downtown St. Louis. Impacts to the existing bus routes on adjacent streets in downtown St. Louis would be negligible.

With the continuation of the current management practices at the Memorial, the pedestrian and bicycle circulation environment would

remain problematic. The undesirable conditions for pedestrians crossing Memorial Drive would continue, although minor improvements, in coordination with the City and State, could be made. No new accessible routes or new bicycle facilities would be developed.

On-site parking facilities, primarily the Arch Parking Garage and Old Cathedral Parking Lot, would remain under the no action alternative. The continued shortage of oversized vehicle parking would persist. There would be no changes to water transportation under the no action alternative. The existing partnership with the Riverboat ferry operator would remain, with no new additional water-based transportation.

ANALYSIS OF CUMULATIVE IMPACTS

Under the no action alternative, adverse transportation and access conditions at the Memorial would remain. However, ongoing and planned projects within the study area, when considered together with these adverse impacts, would not contribute to a cumulative impact to transportation and access.

CONCLUSION

The no action alternative would result in the short term continuation of minor adverse transportation conditions at the Memorial. Over time, transportation conditions could further deteriorate, causing negligible to minor long-term adverse impacts.

Socioeconomics

SOCIOECONOMICS

ANALYSIS OF DIRECT AND INDIRECT IMPACTS The no action alternative would continue to generate a steady state of spending within the region over the life of the plan. This spending would have beneficial economic impacts. The National Park Service must use its budget to pay for operating expenditures such as payroll, utilities, supplies, and materials to operate the Memorial. The National Park Service has estimated that the implementation of the no action alternative would cost \$19.7 million per year and require approximately 282 full-time equivalents (FTE) in employment. This infusion of federal agency spending into the economy is estimated to generate an addi-

tional 95 jobs and \$3.6 million in labor income from additional economic activity.

A greater economic impact is generated by the tourists that travel from outside the area to visit the Memorial. The National Park Service has estimated that visitation to the Memorial is approximately 3.0 million visitors per year. Of this total, 1.8 million visitors enjoy Memorial grounds resources. Of the 1.8 million visits, approximately 78 percent arrive from outside the area, and through their spending provide an influx of revenue for the local economy. This influx of revenue is estimated to generate over 1,950 jobs and \$52 million in income in the region.

The economic effects of operations and visitor use at the Memorial under the no action alternative would have a long-term minor to moderate beneficial impact. The economic contribution to some industries (hotel and restaurants) and geographical areas is noteworthy (downtown St. Louis) and is expected to continue throughout the life of the plan.

ANALYSIS OF CUMULATIVE IMPACTS An examination of all relevant planning documents for the immediate area surrounding the Memorial reveals that the area would remain highly urbanized. Other plans to further develop the Gateway Mall may also introduce more visitors to the downtown area, potentially augmenting visitation to the Memorial. While this may increase the number of residents visiting the Memorial, it is not likely to have more than a negligible impact on out-of-town visitors, and thus offers a negligible economic impact. The cumulative economic impact would be beneficial but minor, with impacts limited primarily to local businesses in the downtown area.

CONCLUSION Management of the Memorial would not significantly change from current conditions under the no action alternative. The Memorial would continue to be a major attraction for visitors coming to the St. Louis area. Under this alternative, visitation to and operation of the Memorial would continue to have a long-term minor to moderate local beneficial economic impact to the region.

LAND USE

ANALYSIS OF DIRECT AND INDIRECT IMPACTS The no action alternative would be expected to have minor adverse long-term impacts on local land use. Under this alternative, the National Park Service would continue to focus its attention on the west side of the Mississippi River. By not proactively participating in the planning of development for the east side of the river, the National Park Service may not be able to limit incompatible development of land which could adversely impact the Memorial. In addition, while the National Park Service continues to partner with the City of St. Louis to improve at-grade crossings at Memorial Drive, improvements have not been made to date and there are no firm plans to improve the at-grade crossings at this time.

ANALYSIS OF CUMULATIVE IMPACTS The land use environment in which the Memorial is located is dynamic, and is not isolated from land use changes in the surrounding community. The Memorial is located in a highly urbanized area; new development, or redevelopment of existing properties, is being discussed and undertaken. Some plans call for the redevelopment of areas near the Memorial such as Ballpark Village, which could provide additional residential and commercial spaces within a short distance of the site. Because land use under this alternative is not expected to change, cumulative impacts on land use are likely to be negligible.

CONCLUSION The no action alternative is expected to have a minor long-term adverse impact on local land use. With a lack of focus on planning activities in East St. Louis, the National Park Service may lose the ability to influence future land use in the East St. Louis addition. Also, under this alternative, the National Park Service would not make any substantial changes in land use on the Memorial.

NPS Operations

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Assuming current funding trends persist and staffing levels remain similar to those present, the Memorial would continue to be unable to

fully achieve desired conditions in program areas such as museum and interpretive services and administration. In addition, the deferred maintenance backlog would continue to grow over time. The no action alternative would have ongoing long-term minor to moderate adverse impacts on the NPS operations, but there would be no new impacts.

ANALYSIS OF CUMULATIVE IMPACTS

Ongoing and planned maintenance repairs of site walkways, benches, and planting projects would have minor beneficial impacts over time. The contributions of any existing planned projects would be limited, due to the funding and staffing challenges outlined above. Therefore, the no action alternative would have long-term minor adverse cumulative impacts.

CONCLUSION

Ongoing impacts (long-term minor to moderate local and adverse) would continue.

Unavoidable Adverse Impacts

Some negligible to minor adverse impacts to soils and vegetation would result from the continued use of the Memorial by visitors. In addition, the maintenance of the Memorial over time would have minor long-term adverse impacts on the soundscape of the Memorial. These impacts are considered unavoidable.

Irreversible and Irrecoverable Commitments of Resources

Irreversible commitments of resources are actions that result in the loss of resources that cannot be reversed. Irrecoverable commitments of resources are actions that result in the loss of resources for a period of time. With the exception of the consumption of fuels and raw materials for maintenance activities, no actions in this alternative would result in the use of nonrenewable natural resources or the use of renewable resources that would preclude other uses for a period of time.

Relationship of Short-Term Uses and Long-Term Productivity

Jefferson National Expansion Memorial would continue to be used by the public as a cultural

and recreational resource, and the National Park Service would manage the Memorial to preserve its cultural and natural resources. Actions would be taken with care to ensure that uses do not adversely affect the long-term utilization of cultural and natural resources at the site.

4.4 IMPACTS OF ALTERNATIVE 3 – PROGRAM EXPANSION

Cultural Resources

HISTORIC BUILDINGS, STRUCTURES, SITES, OBJECTS AND DISTRICTS

ANALYSIS OF DIRECT AND INDIRECT IMPACTS Under the Program Expansion alternative, the Memorial is revitalized by expanded programming, facilities, and partnerships through a design competition similar to the 1947 competition. The selected design would also expand interpretation, education opportunities, and visitor amenities. New development would occur at the north or south ends of the site, or potentially along portions of Memorial Drive. Development would not occur within the main north-south axis through the Memorial grounds. However, development could occur within Luther Ely Smith Square. Through guidelines established within the competition program, the National Park Service would strive to preserve the essential character-defining features of the NHL and the designed landscape. Impacts to the Memorial would range greatly depending on the location of the new elements and their above-ground expression. All actions affecting the historic structures on the Memorial grounds or within the APE would be undertaken in consultation with the Missouri and Illinois SHPOs and the Advisory Council on Historic Preservation.

The following discussion outlines impacts on historic buildings, structures, sites, objects, and districts, both on-site and within the surrounding area.

Gateway Arch: The ramps and stairs at the existing entrances to the Museum of Westward Expansion would be redesigned to meet ADA/ABAAS standards. This would generate minor short- and long-term adverse impacts on the

Gateway Arch. The construction of design elements within the competition zone may have a range of impacts, depending on the location of the new elements and the degree to which built elements are visible above grade. Proposed new elements constructed at the north or south ends of the Memorial grounds, in the areas that currently house the parking garage and maintenance facility, could potentially alter views of the Gateway Arch, depending on the height, scale, and massing of new built elements. Thus, long-term adverse impacts would be negligible to major. If proposed new elements are located along Memorial Drive outside of the east-west axis, long-term adverse impacts would be negligible to moderate and local, depending on the degree to which new elements are visible from the base of the Gateway Arch. The construction of built elements within the east-west axis, including bridges or a deck over Memorial Drive, or a building within Luther Ely Smith Square, may generate short- and long-term negligible to moderate local adverse impacts on the Gateway Arch. If built elements are visible within views between the Gateway Arch and the Old Courthouse, impacts would have a greater degree of severity than if they are partially or wholly below grade. Thus, depending on the location and above-grade expression of new built features, there could be an adverse effect under Section 106.

Old Courthouse: Under this alternative, the Old Courthouse would be preserved and the leaking roof would be repaired. This would result in a moderate long-term local beneficial impact on the building. West of the Gateway Arch, there may be any combination of a single elevated deck, multiple bridges, and improved at-grade pedestrian crossings at Memorial Drive. Ventilation may be required for a tunnel below Memorial Drive. If the ventilation can be achieved through a below-grade apparatus, long-term local adverse impacts to the Old Courthouse would be negligible. However, if a low scale, but still above-grade apparatus, is required for ventilation, it could be apparent in views from the Old Courthouse towards the Gateway Arch grounds, resulting in minor indirect long-term local adverse impacts on the Old Courthouse structure. In addition, the deck may obstruct views of the Old Courthouse from certain points along the east-

west axis, resulting in indirect short- and long-term negligible to moderate adverse impacts. Streetscape improvements proposed around the Old Courthouse would be accomplished in a manner such that the setting of the historic structure and its key features, including the sundial and fountain, are not compromised. Under this alternative, development could occur within Luther Ely Smith Square. If the square is re-planted in accordance with the Saarinen-Kiley concept, with allées of uniform trees, long-term moderate beneficial impacts could result. If an above-grade structure is proposed within Luther Ely Smith Square such that it blocks views of the Old Courthouse from the Gateway Arch, there would be long-term moderate local adverse impacts to the Old Courthouse. Thus, there could be an adverse effect to the Old Courthouse under Section 106.

Grand Staircase: Barrier-free routes would be provided from the Gateway Arch to the riverfront. These paths would likely be visible from the Grand Staircase, resulting in minor short- and long-term local adverse impacts on this historic structure. However, the new access routes would be designed in accordance with the *Secretary of the Interior's Standards for Rehabilitation* and the *Guidelines for the Treatment of Cultural Landscapes* and thus there would be no adverse effect under Section 106.

North and South Overlooks: If the design competition proposes new elements at the north or south ends of the Memorial grounds, there may be indirect impacts on the North and South Overlooks. Depending on the height and mass of the above ground expression, there may be short- and long-term minor beneficial to moderate adverse impacts on the Overlooks. This could result in an adverse effect under Section 106.

Railroad Tunnels: There would be negligible short- or long-term adverse impacts on the railroad tunnels. In addition, there would be no adverse effect under Section 106.

Resources within the APE: Under the Program Expansion alternative, new design elements may be proposed in the vicinity of the Old Cathedral. Depending on the nature and loca-

tion of these features, there may be negligible to major short- and long-term adverse impacts on the Old Cathedral. If the competition results in new construction at the north end of the Memorial grounds, views south from Eads Bridge would be altered. If there is an above-grade expression, such that it obstructs views of the Gateway Arch from the bridge, long-term local adverse impacts to Eads Bridge could be moderate. This could result in an adverse effect under Section 106. Instead, if a new structure was placed below grade, with a planted surface expression, there could be minor long-term local beneficial impacts to Eads Bridge. In addition, streetscape improvements along Washington Avenue may have negligible to minor adverse impacts on the bridge, depending on the location and extent of improvements. The proposed design resulting from the competition may further impact historic structures and districts north and west of the Memorial, including the Laclede's Landing Historic District, the J. Kennard Carpet Company Building, the Missouri Athletic Club Association Building, the Mississippi Valley Trust Company Building, the International Fur Exchange, the Security Building, and Pet Plaza (see Figure 3.4 for the location of these resources). These historic resources have visual connections to the Memorial grounds. Depending on the potential height and location of new features proposed in the design competition, there may be negligible to minor long-term local adverse impacts on these historic buildings and districts.

ANALYSIS OF CUMULATIVE IMPACTS

There may be moderate beneficial to moderate adverse short- and long-term local impacts on historic structures as a result of the implementation of the Program Expansion alternative. These impacts, when considered together with the residential, mixed-use, and commercial developments that are planned and underway in downtown St. Louis, would not contribute to a cumulative impact on historic buildings, structures, sites, objects, and districts.

CONCLUSION AND IMPAIRMENT FINDING

Within the Memorial boundary, there may be negligible to major short- and long-term local adverse impacts on the Gateway Arch, and potential moderate adverse to moderate

beneficial short- and long-term local impacts on the Old Courthouse. In addition, there may be minor short- and long-term adverse local impacts on the Grand Staircase and short- and long-term minor beneficial to major adverse local impacts on the North and South Overlooks. Outside of the Memorial, there may be minor to moderate short- and long-term local adverse impacts on the Old Cathedral, and short- and long-term minor beneficial to moderate adverse local impacts on Eads Bridge. Finally, there may be negligible to minor long-term local adverse impacts on various historic structures and districts that have a visual relationship with the Gateway Arch grounds, including the Laclede's Landing Historic District, the J. Kennard Carpet Company Building, the Missouri Athletic Club Building, the Mississippi Valley Trust Company Building, the International Fur Exchange, the Security Building, and Pet Plaza. Under Section 106, there could be adverse effects to the Gateway Arch, the Old Courthouse, the North and South Overlooks, and Eads Bridge. None of these adverse effects, taken singly or together, constitute or would lead to impairment.

CULTURAL LANDSCAPES

ANALYSIS OF DIRECT AND INDIRECT IMPACTS Under the Program Expansion alternative, the Memorial would be revitalized by expanded programming, facilities, and partnerships. This revitalization would be achieved through a design competition that proposes new elements for the Memorial grounds. The competition zone was drawn to protect certain critical viewsheds and landscape spaces. Through guidelines established within the competition program, the National Park Service would strive to preserve the essential character-defining features of the NHL. Impacts to the Memorial would range greatly depending on the location of the new buildings and their above-ground expression. Thus, there is the potential for this alternative to diminish the Memorial's fundamental resources and values, specifically the NHL Gateway Arch and designed landscape, with their purposeful approach, scale, and aesthetic qualities, including the relationship to the river and to the Old Courthouse and the corresponding views. Although the National Park

Service assumes there would be changes to the look of the Memorial and, potentially, changes to the NHL as a result of a design competition, ultimately, the National Park Service would not allow the implementation of a design element that would cause the NHL to be delisted.

The spatial organization of the site is of paramount importance to the maintenance of the integrity of the NHL. Disruption of this organization has the potential to generate major adverse impacts and thus adverse effects under Section 106. Construction of new buildings, parking, and other amenities within the competition zone would alter the Memorial's spatial organization dramatically. The potential for dense development within the competition zone, changing large landscaped areas to built areas, could alter the intended relationship between open and closed spaces on the Memorial grounds, resulting in a major long-term adverse local impact to the Memorial landscape. Long-term adverse impacts would be negligible to minor and local if development is minimized and placed below grade or within the East St. Louis addition.

Potential development of above-grade facilities along the west edges of the ponds would alter the intimate experience of the water features and the surrounding landscape, including the Bald Cypress Circles. Depending on the height, mass, and scale of such facilities, there could be minor to major long-term local adverse impacts to these essential elements of the Memorial's spatial organization.

The east-west axis that stretches from the Old Courthouse east towards the Gateway Arch and the river is both an organizing element in the landscape and an essential view. These features may be altered under the Program Expansion alternative. If an elevated deck is proposed to connect the Old Courthouse and Gateway Arch, it could obstruct views along the east-west axis of the Memorial. If elevated pedestrian walkways are proposed to connect the Old Courthouse and Gateway Arch, the established spatial organization of the cultural landscape may be enhanced along the strong east-west axis. If a lid is developed over Memorial Drive, ventilation may be required. If the ventilation can be achieved through a below-grade apparatus, long-term

impacts to the east-west axial viewshed would be negligible. However, if a low-scale, but still above-grade apparatus is required, it could be apparent in views from the Old Courthouse towards the Gateway Arch grounds, resulting in minor to moderate long-term adverse impacts on this designed view. Further, under this alternative, development could occur within Luther Ely Smith Square. If there is no above-grade expression and the square is re-planted in accordance with the Saarinen-Kiley concept (allées of uniform trees), long-term moderate beneficial local impacts could result. If an above-grade structure is proposed within the Square, long-term adverse impacts to the cultural landscape could be minor to major and local, depending on the degree to which these elements obstruct the important designed view since this axis has been classified as an essential character-defining feature.

Views along the north-south axis may also be impacted under the Program Expansion alternative. If buildings or features are constructed at the north or south ends of the Memorial, short-term local adverse impacts would be minor to moderate. Long-term local impacts may be minor and beneficial, if the above-grade expression of the current parking garage is replaced by a surface planted expression. However, if built features are visible from the base of the Gateway Arch, impacts would be long-term local major and adverse.

Views from the North and South Reflecting Ponds, from the North and South Overlooks, and from East St. Louis may be impacted by the Program Expansion alternative. Views from the overlooks could be impacted by construction at the north and south ends of the Memorial. Depending on the height and mass of the above-ground expression, there may be short- and long-term minor beneficial to moderate adverse impacts on these views. The view from East St. Louis looking west towards the Gateway Arch may be improved if a facility is constructed on the east side of the river that offers visitors an unobstructed view over the levee of the Gateway Arch and grounds. Potential long-term impacts on this view would be negligible to moderate beneficial.

The construction of new structures, parking, or other amenities within the competition

zone would alter topography at the Memorial, an essential character-defining feature of the landscape. Changes to topography at the Memorial should not alter spatial relationships between different parts of the grounds and key views of the Gateway Arch, also essential character-defining features of the NHL. Overall, there is potential for minor long-term local beneficial impacts (if Luther Ely Smith Square is regraded and planted according to the Saarinen-Kiley design concept) to major long-term adverse impacts on the site's topography within the competition zone. East of the competition zone, the redesign of the entrances to the Gateway Arch and accessible ramps to the riverfront may cause minor long-term local adverse impacts on the site's topography.

Increased connectivity between the Old Courthouse and the Gateway Arch is a goal included within the guidelines for the design competition. Proposals for increased connectivity may include any combination of a single elevated deck, multiple bridges, and improved at-grade pedestrian crossings across Memorial Drive. If completed in accordance with the Saarinen-Kiley concept, these elements may result in long-term minor to moderate beneficial impacts on spatial organization and circulation at the Memorial.

New proposed circulation elements (pathways, access drives, parking, etc.) have the potential to disrupt existing circulation patterns on the site, resulting in negligible to major long-term local adverse impacts. To minimize impacts, proposed circulation elements should be restricted to those necessary to provide access to new facilities and should not disrupt the Saarinen-Kiley designed circulation patterns that are critical to a visitor's experience of the historic landscape.

The potential construction of built features within the design competition zone may impact critical vegetation, such as sections of the ash plantings along the walks. These plantings may require removal during construction, resulting in moderate to major local adverse impacts on the cultural landscape. However, if it is possible to reconstruct the plantings after new facilities are constructed, the impact would be mitigated and would result in

negligible to minor long-term adverse impacts on the cultural landscape. Depending on the density of development within the competition zone, there may be a substantial loss of vegetation on the Memorial grounds. This would result in moderate to major long-term local adverse impacts.

The potential increase in visitation at the Memorial as a result of new educational and interpretive programs and visitor amenities may increase commercial activity within the surrounding neighborhood, enhancing the urban environment and resulting in minor to moderate long-term local beneficial impacts to the natural and constructed setting. However, the potential increase in visitors may result in crowding and higher wear and tear on the landscape, culminating in a minor to moderate short-term local adverse impact on the vegetation at the Memorial, possibly leading to minor to moderate long-term local adverse impacts.

There may be changes to small-scale features as a result of the implementation of the Program Expansion alternative. Impacts may be short- and long-term local and negligible to moderate. These impacts may be mitigated by replacement of the features after construction. The Program Expansion alternative has the potential to have an adverse effect under Section 106 on the cultural landscape of the Memorial. According to (c)(2) Section 110(f) of the NHPA, approval of any Federal undertaking which may directly and adversely affect any NHL requires that the head of the responsible Federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark, and shall afford the Advisory Council a reasonable opportunity to comment on the undertaking .

ANALYSIS OF CUMULATIVE IMPACTS The implementation of the Program Expansion alternative would result in short and long-term moderate beneficial to major local adverse impacts on the cultural landscape at the Memorial. These impacts, in particular the increased wear and tear on the Memorial landscape as a result of higher visitation levels, could contribute to a minor to moderate short-term local adverse cumulative impact,

when considered together with the residential, mixed-use, and commercial developments that are planned and underway in downtown St. Louis.

CONCLUSION AND IMPAIRMENT FINDING

The Program Expansion alternative may result in short- and long-term moderate beneficial to moderate adverse local impacts on the cultural landscape at Jefferson National Expansion Memorial. Although changes to the NHL likely would occur as a result of a design competition, and the implementation of the winning entry may result in long-term, minor to moderate adverse effects, the multiple levels of protection put into place by the NPS to ensure the protection of the Memorial's fundamental resources, would prevent adverse effects leading to impairment.

ARCHEOLOGICAL RESOURCES

ANALYSIS OF DIRECT AND INDIRECT

IMPACTS Several components of this alternative include a ground-disturbing element that may impact buried archeological resources. These elements constitute different levels of ground disturbance and are located in areas that have varying levels of archeological sensitivity. The impact assessments take these two factors into account, recognizing that most elements have not yet been designed and that the precise locations of archeological resources are not known. The following table (Table 4.1) summarizes the components that are likely to disturb the ground and the archeological sensitivity of the area of disturbance. This is followed by a discussion of the level of disturbance and its potential impact on archeological resources.

Component with Potential for Ground Disturbances	Type of Disturbance Likely	Archeological Sensitivity	Impact Assessment
Increased connectivity between Old Courthouse and Gateway Arch	Minor disturbance from street improvements for pedestrian access	High	Minor to Moderate
Increased connectivity between Old Courthouse and Gateway Arch	Moderate disturbance for pedestrian bridges	High	Moderate
Increased connectivity between Old Courthouse and Gateway Arch	Major disturbances for elevated decks	High	Major
Encourage compatible riverfront improvements	Minor to moderate disturbances from improvements compatible with the park	Low to Moderate	Negligible to Moderate
ADA/ABAAS compliance	Minor disturbance from excavation for ADA/ABAAS compliant railings or ramps	Moderate	Negligible to Moderate
Expanded on-site RV parking	Minor disturbances from reconfiguring parking area	Moderate	Negligible to Moderate
Expanded on-site RV parking	Moderate to major disturbances if parking is moved elsewhere	Low to High	Negligible to Major
Streetscape improvements	Minor disturbances from installation of landscape elements, signage, etc.	Low to Moderate	Negligible to Moderate
Move maintenance facility	Major disturbances from footings/foundation for new facility	Low to High (depending on placement of facility)	Minor to Major
Design competition	Major disturbances possible from placement of new structures	Low to High (depending on placement of facilities)	Moderate to Major

Table 4.1 Impacts to Archeological Resources in Alternative 3 - Program Expansion

Many of the ground disturbing activities, such as the installation of ADA/ABAAS ramps would have at most a minor local or regional, long-term adverse impact (no adverse effect) on archeological resources. A few of the activities in this alternative have the potential to cause major local or regional, long-term adverse impacts (adverse effect) on archeological resources. These include construction of the elevated decks, which may cause a large disturbance within an area that has a high archeological sensitivity. The design competition, the potential movement of the maintenance facility, and the relocation of parking are other components that may precipitate major local or regional, long-term adverse impacts (adverse effect) on archeological resources, especially if new facilities are placed in areas of high archeological sensitivity.

If archeological resources are encountered during any of the moderate to major ground disturbing activities but the activity is then modified to avoid the resource, this would comprise a beneficial local or regional, long-term impact (no adverse effect) because the location of the site would then be known and protected from future inadvertent impact. Likewise, elements of this alternative that do not include ground disturbing activities would have minor local or regional, long-term beneficial impacts (no adverse effect) on potential archeological sites that may remain preserved as a result. One element of this alternative is the boundary modification of the Memorial, which adds approximately 50 acres in East St. Louis. This represents a moderate local or regional, long-term beneficial impact (no adverse effect), as it places any archeological resources that might be located on the parcel under the NPS jurisdiction, therefore protecting them by federal law.

ANALYSIS OF CUMULATIVE IMPACTS

If important archeological resources are encountered as a result of this alternative, cumulative impacts would occur from the incremental impact of this alternative when added to other past, present, and foreseeable future actions. The geographic area that was considered for cumulative impacts on this alternative consists of historic downtown St. Louis and the East St. Louis riverfront area.

Multiple projects are planned or have recently been completed in downtown St. Louis, while less development has occurred or is planned in the East St. Louis riverfront area. Past projects in St. Louis, such as Cochran Gardens and Walsh's Row, have yielded archeological evidence of the historic use of the downtown, indicating that intact, potentially significant subsurface deposits remain within historic downtown St. Louis. It is likely that the planned projects would also impact archeological sites.

Archeological sites are protected by both local and non-local laws and ordinances (as outlined in Chapter 1). Archeological sites are non-renewable resources. In general, impacts on significant archeological sites are mitigated by data collection, and that data collection, along with subsequent development of the site, causes the destruction of that archeological site. Because of the likelihood that past, present, and foreseeable future actions in the cumulative study area would impact archeological resources, any adverse impacts/effects on archeological sites discovered as a result of this alternative would have a major local or regional, long-term cumulative impact.

CONCLUSION AND IMPAIRMENT FINDING

Overall, the Program Expansion alternative would have local or regional, long-term impacts ranging from minor beneficial to major adverse, depending on the level of ground disturbance. Thus, there could be an adverse effect under Section 106.

The ground disturbing activities on this alternative may encounter significant archeological resources. Depending on the size of the disturbance, these activities would have a local or regional, long-term adverse impact ranging from minor (no adverse effect) to major (adverse effect). The range of potential impacts under this alternative are due, in part, to the lack of specific information regarding the exact nature and location of physical actions which would be identified through the design competition. These impacts would need to be further refined as the elements and locations are finalized.

Elements of this alternative that would not disturb the ground or would be adjusted

to avoid archeological sites would have no adverse impact (no adverse effect) on archeological resources, and may have a minor local or regional, long-term beneficial impact if the resources remain preserved below the surface.

Out of all of the alternatives, this one has the greatest potential for an adverse impact on archeological resources due to the many components that may cause large disturbances in areas with high archeological sensitivity.

CURATORIAL RESOURCES AND MUSEUM COLLECTIONS

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Under the Program Expansion alternative, those portions of the collection on display would continue to be housed in the Museum of Westward Expansion and the Old Courthouse. The balance would continue to be housed in the dedicated collections room in the Old Courthouse. Current space and access would remain limited. Thus, there would be minor long-term local adverse impacts on curatorial resources and museum collections. However, the roof of the Old Courthouse, that currently allows water incursions into the storage space, would be repaired, and electrical supply and climate control would be upgraded resulting in moderate long-term local beneficial impacts.

ANALYSIS OF CUMULATIVE IMPACTS

Under the Program Expansion alternative, there would be minor adverse to moderate beneficial long-term impacts on curatorial resources and museum collections. Given the fact that projects considered under cumulative impacts within the St. Louis area would not have any effects on museum collections, and considering that there would be no additional adverse effects under this alternative beyond those direct and indirect impacts already identified in this chapter, there would not be any cumulative impacts to curatorial resources under this alternative.

CONCLUSION AND IMPAIRMENT FINDING

The implementation of the Program Expansion alternative would result in long-term minor adverse to moderate beneficial local impacts on curatorial resources and

museum collections. There would be no impairment of curatorial resources and museum collections as a result of the Program Expansion alternative.

Natural Resources

VEGETATION

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Minor to moderate impacts on vegetation in the East St. Louis addition would occur as a result of clearing related to construction of new design elements. However, this would also create opportunities to restore and enhance the planting in these areas. Negligible to moderate impacts might occur as a result of the design competition. Since this area is currently dominated by early successional or invasive species, overall impacts would be beneficial.

ANALYSIS OF CUMULATIVE IMPACTS

Past land use practices have completely removed the original forested land cover of the St. Louis/East St. Louis area and created the urban/developed land cover that exists today. Since impacts on vegetation communities within the study area would generally be considered beneficial due to the removal of invasive species, there would be no cumulative impacts on vegetation communities.

CONCLUSION AND IMPAIRMENT FINDING

Potential impacts on vegetation communities range from beneficial to moderate adverse. Final design entries would undergo additional environmental review by the National Park Service to determine the impacts of various design alternatives with greater specificity. Long-term beneficial impacts would result from the removal of invasive species; however, there would be a short-term temporary disruption of the successional habitat community. No impairment of Memorial grounds resources is anticipated from this alternative.

THREATENED AND ENDANGERED SPECIES

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

The current location of the federally designated Threatened decurrent false aster on the east bank of the Mississippi River below the

levee is within the area included in the design competition. However, the presence of the decurrent false aster in the area would necessitate a field survey to establish its precise location and extent of locally available habitat to be protected. Thus, the Expanded Programming alternative would not likely adversely affect this species.

ANALYSIS OF CUMULATIVE IMPACTS

None of the projects considered as part of the cumulative impacts analysis are located on the east side of the river where the current local population is present. Thus, cumulative impacts on the decurrent false aster as a result of the Program Expansion alternative would be unlikely.

CONCLUSION AND IMPAIRMENT FINDING

Until the design competition is completed, there would be no additional development, loss of habitat, or changes in maintenance or management practices in the near-term in decurrent false aster population areas on the east side of the river. Any future development that might result from the design competition would be preceded by a site survey to determine whether or not the species is present. If the species and any critical habitat is present, the USFWS would be consulted. Thus, impacts on this threatened species are unlikely and no impairment of Memorial grounds resources within the study area would occur.

SOUNDSCAPE

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

There would be minor short-term impacts on the soundscape of the Memorial from the construction of the pedestrian enhancements, streetscape improvements, pedestrian crossings over Memorial Drive, accessible ramps to the riverfront, and other facilities proposed through the design competition. Noise from these activities would be greatest in the immediate vicinity of the construction activity, and would diminish as visitors migrate away from the activity. Given the existing background noise levels throughout much of the Memorial, noise from construction would only be periodically discernable above background noise levels and would generally not interfere with a user's enjoyment of the Memorial grounds.

There would be continuing minor long-term impacts on the soundscape of the Memorial from the existing maintenance-related activities on the Memorial grounds including lawn mowing and testing of the emergency generators. In addition, if the grounds maintenance facility is moved off the Memorial grounds, there would be minor long-term impacts on the soundscape as maintenance vehicles would be operated in off-site areas.

Increased visitation and vehicular traffic on the Memorial grounds and the East St. Louis addition would result in a minor long-term impact on the soundscape of these areas. Increased special events programming would result in large numbers of people driving to and congregating on the Memorial grounds. The crowd noise and amplified music or public address systems would constitute a minor to moderate short-term impact on the soundscape of the Memorial.

If a broad elevated deck is constructed over Memorial Drive as a result of the design competition, this would have a minimal impact on the soundscape of the Memorial grounds. However, depending on the use of noise-absorbing materials on the underside of the deck, some of the traffic noise may be either reflected or absorbed. Overall impacts of an elevated deck on the soundscape of the Memorial would be negligible.

ANALYSIS OF CUMULATIVE IMPACTS

There would be negligible to moderate short-term adverse impacts and minor long-term adverse impacts on the soundscape of the Memorial. When considered together with the ongoing and planned projects within the study area, there would be a minor short-term adverse impact on the soundscape within the study area.

CONCLUSION AND IMPAIRMENT FINDING

There would be negligible to moderate short-term adverse impacts and minor long-term adverse impacts on the soundscape of the Memorial. These impacts would not impair the soundscape of the Memorial.

Visitor Opportunities and Use

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Visitor opportunities are expected to improve with the redesign of exhibits to include more interactive experiences. In addition, the results of the design competition might introduce more elements to the Memorial that would provide state-of-the-art exhibits and exhibitions. While the magnitude of impacts from these new facilities on visitor experience is indeterminate until details of the design competition are known, it is likely they would be beneficial over the long-term. Visitors would continue to have access to recreational activities on the surface of the Memorial grounds.

Visitors would be expected to benefit from the expansion of food services throughout the Memorial. Visitor opportunities would improve with the development of barrier-free access and improved streetscapes and connections with downtown and local neighborhoods. Short-term adverse impacts might occur to visitor opportunities due to disruption caused by the construction of new facilities. Short-term adverse impacts would also occur during peak periods due to crowding at popular sites.

Implementation of the Program Expansion alternative would have a short-term moderate to major beneficial impact on visitor use. If the results of the design competition introduce more facilities to the Memorial, this might result in a short-term increase in visitors and residents coming to experience a new attraction. Under this scenario, visitation would be expected to decline over the long-term, which is common for other similar facilities. As discussed above, visitor opportunities would be expected to improve under the Program Expansion alternative with the rehabilitation of exhibits, the introduction of more interactive experiences and expansion of food services. This could encourage more repeat visitors to the site, increase the number of first-time visitors, and/or encourage visitors to extend their stay at the Memorial. The development of barrier-free and ADA/ABAAS-compliant access to the Memorial could encourage more people to visit the site. Visitation would also be

expected to increase with the addition of more special events. Overall impacts to visitor use would be moderate to major and beneficial in the short-term and moderate and beneficial in the long-term.

ANALYSIS OF CUMULATIVE IMPACTS

Under this alternative, it is expected that the design competition would introduce new ideas for improved connection between the Memorial and downtown St. Louis. Improving connectivity with the urban setting around the Memorial would expand the types of activities and amenities visitors would have access to while visiting the Memorial. Visitors would be more likely to support local businesses and other attractions in the downtown area, which would benefit other entities. In addition, individuals visiting or working in downtown would be more likely to visit the Memorial under these conditions. Overall, this alternative would create a minor beneficial cumulative impact on visitor use and experience of downtown St. Louis.

CONCLUSION

Implementation of the Program Expansion alternative would likely have moderate to major beneficial short-term impacts on visitor use and moderate beneficial long-term impacts. The development of new elements as a result of the design competition might encourage significant increases in visitation of new attractions at the Memorial. In addition, modification and rehabilitation of exhibits and heritage programs, including more interactive experiences would improve visitor opportunities, attracting new visitors and encouraging more use of underutilized facilities. Improvements in streetscapes would increase connectivity to local neighborhoods in downtown St. Louis and have a long-term beneficial impact on local visitor opportunities and use.

Transportation and Access

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Under the Program Expansion alternative, changes may occur to the roadway network surrounding the Memorial. The largest of these changes would impact I-70 and the Memorial Drive corridor, both of which are

part of the design competition zone. As such, the potential range of impacts is broad, with multiple configurations possible, including any combination of a single elevated deck, multiple bridges, or improved at-grade crossings. Given the unknown nature of the winning design, the impacts on the roadway network would be either adverse or beneficial.

Public transportation to and from the Memorial could experience moderate to major beneficial impacts under the Program Expansion alternative. Part of the benefit derives from the potential removal of the Arch Parking Garage as part of the design competition and its replacement with a structure or facility that better mediates the access between the Metro Link Station at the Eads Bridge and the Gateway Arch. In addition, potential programmatic changes to areas within the design competition zone might lead to increased visitor demand at the Memorial. Some of the new visitors and increased staff, would arrive via public transportation, particularly if substantial new parking facilities are not included as part of the winning design entry.

The results of the design competition would result in moderate positive impact on pedestrian circulation from an elevated deck over Memorial Drive. In addition, there would be minor positive impact on pedestrian circulation resulting from enhanced connections to Laclede's Landing and to the downtown at the Northwest Plaza. Within the Memorial, new barrier-free routes to the riverfront, as well ADA/ABAAS-accessible entrances to the Museum of Westward Expansion would enhance the pedestrian experience. New and existing partnerships for transportation could include additional bicycle infrastructure and facilities. In addition, new facilities within the design competition zone might be more accommodating to the regional bicycle networks that traverse the Memorial grounds than the current surface streets. The impacts on pedestrian and bicycle circulation are expected to be moderate and beneficial.

The increase in visitor parking demand near the Old Courthouse and Luther Ely Smith Square resulting from enhanced programming would cause a minor impact on the parking in the area. Improving the bus drop-off at the

Old Cathedral would have a minor beneficial impact. Potential changes to the Arch Parking Garage, as part of the design competition zone, might result in minor to major impacts, depending upon the amount of parking provided.

The Program Expansion alternative contains no explicit plans for enhanced water transportation between the Memorial and the East St. Louis side of the river. The design competition zone includes the East St. Louis side, so the results of the competition might introduce a water-based transportation enhancement. The range of impact would be negligible to minor beneficial.

ANALYSIS OF CUMULATIVE IMPACTS

The cumulative impacts of the Program Expansion alternative could be substantial. Again, much depends on the outcome of the design competition. Major new cultural facilities, in conjunction with the Gateway Arch, could stimulate visitor use to include both increased local and regional trips to the Memorial. Together with future changes to the regional transportation network, including planned and proposed Metro rail expansion, a new I-70 bridge crossing the Mississippi River north of the Memorial, and the introduction of high speed rail, linking St. Louis to Chicago and Kansas City, as outlined by the Midwest Regional Rail Initiative, the changes to the Memorial could result in moderate to major beneficial impacts from investments in transportation infrastructure.

CONCLUSION

The Preferred alternative could result in moderate to major long-term adverse to beneficial impacts on the transportation resources of the Memorial. This determination derives from the unknown, yet potentially substantial changes to the existing transportation conditions, depending upon the outcome of the design competition.

Socioeconomics

SOCIOECONOMICS

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Implementing the Program Expansion alternative would increase expenditures on operations and staffing over the no action alternative. Annual expenditures would increase by \$5.4 million to over \$25.1 million total, while staffing is estimated to rise by an additional 64 FTE over the no action alternative. Increases in expenditures and staffing would have minor beneficial long-term economic impacts on the region as more federal expenditures are made in the local area. In addition to ongoing operations, a potential beneficial short-term economic impact might occur with the construction of new design elements resulting from the design competition. The actual magnitude of this impact is indeterminate without details on the size and number of these elements.

It is expected that expanded programming and facilities would increase visitation to the Memorial. New programming and facilities might generate a short-term moderate beneficial economic impact from visitation to the Memorial, as residents and visitors come to participate in new attractions and activities. Over time, new activities and/or attractions have the potential to generate a net increase in visitation and average visitor stay. Increased connectivity at Memorial Drive would have a minor beneficial economic impact on businesses in the downtown area by encouraging visitor traffic between the Memorial and downtown. Prolonged increases in visitation due to revitalization of exhibits and addition of special events would have long-term, minor beneficial economic impacts. A new visitor transportation system would have a minor to moderate beneficial economic impact on downtown St. Louis, depending on the route. If the route reaches to other major attractions and locations in the city, visitors might extend their stay and patronage to more local businesses throughout downtown. The magnitude of economic impacts under the Program Expansion alternative cannot be determined precisely without additional details on the size and type of design elements and programs.

However, it is expected that the impact would be beneficial in both the short- and long-term due to an increase in visitor use.

ANALYSIS OF CUMULATIVE IMPACTS

The implementation of the Program Expansion alternative would have a minor to moderate beneficial economic impacts. When this impact is considered together with other ongoing and planned projects in the study area, this could result in a minor long-term beneficial cumulative impact to socioeconomic resources, with impacts limited to businesses in the downtown area.

CONCLUSION

Management of the Memorial under the Program Expansion alternative would focus on increasing programming, facilities, and partnerships. The Memorial would continue to be a major attraction for visitors coming to the St. Louis area, and its appeal to local residents and visitors would increase with the additional programming and elements of this alternative. Visitation to the Memorial would have a long-term beneficial economic impact on the St. Louis metropolitan area due to visitor spending and expenditures associated with operations at the Memorial, although the precise impact cannot be determined. Cumulative impacts from other projects and planning activities have the potential to increase visitation to the Memorial and the downtown, which would have a minor beneficial impact on downtown retailers and businesses.

LAND USE

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Implementation of the Program Expansion alternative might lead to substantial changes in land use upon the Memorial grounds. This could include the expansion of facilities as a result of the design competition, the potential off-site relocation of the maintenance facility, development of barrier-free entrances, improvements in streetscapes surrounding the Memorial, and changes in visitor parking. The impacts of new, moved, or rehabilitated facilities as a result of the design competition are indeterminate, as the impacts might be both beneficial and adverse. However, development

of new facilities on the surface would negatively impact existing green space with the loss of portions of the Saarinen-Kiley design.

The National Park Service has current authorization to expand the boundaries of the Memorial to include 50 acres in East St. Louis. This could have a long-term beneficial impact to land use as changes in management would alter land use in East St. Louis to be compatible with adjacent land uses (Metro Parks) as well as the Memorial on the west side of the Mississippi River.

ANALYSIS OF CUMULATIVE IMPACTS

The cumulative impacts on land use under this alternative are indeterminate. Development of new facilities at the Memorial might have positive or negative impacts on the surrounding land uses depending on their compatibility with the existing urban environment. For instance, increased development at the Memorial might influence the further redevelopment of adjacent areas such as Chouteau's Landing and bring more visitors to Laclede's Landing and other parts of downtown. Improvements in connectivity and streetscapes could be expected to have a beneficial impact on surrounding land uses.

CONCLUSION

The Program Expansion alternative would have both beneficial and adverse impacts on land use. The alternative would implement various changes in land use including development of new facilities, improvements in connectivity with downtown St. Louis, and changes in management of the East St. Louis addition. While improvements to streetscapes and connectivity with local neighborhoods would have long-term beneficial impacts on land use within and immediately outside the Memorial, development of new facilities could lead to long-term adverse impacts to green spaces within the Memorial. Changes in management in the East St. Louis addition would have long-term beneficial impact on local land use.

NPS Operations

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

The changes proposed in this management alternative would have significant impacts on the operational resources of the Memorial. According to analysis provided by current staff at the Memorial, the changes to the operation of the Memorial related to Program Expansion would require an increase of 64 additional FTE. The final outcome of the design competition would largely influence the extent of the impacts under this alternative. Potential expansion in food service, movement of the maintenance facility, potential movement of the ranger station, expanded educational opportunities, and visitor amenities such as restaurants and restrooms could all contribute to the need for additional operational resources. Therefore, the direct impact would be moderate to major and adverse over the long-term.

ANALYSIS OF CUMULATIVE IMPACTS

Given the current underfunding of operations at the Memorial, the proposed expansion of programming at the Memorial would have moderate to major adverse impacts. These impacts, when considered with other ongoing and planned projects, could contribute to a cumulative impact to operations, since the projects outside of the Memorial grounds could increase the number of people visiting the Memorial. However, the potential for additional partnerships in implementing and managing the successful outcome of the design competition could mitigate these impacts if the existing operational resources are supplemented and enhanced by additional resources.

CONCLUSION

The long-term impacts of the Program Expansion alternative could range from moderate/major beneficial to adverse. Much depends on the outcome of the design competition, and whether the new programs and elements that emerge from the competition come with additional financial resources for operations.

Unavoidable Adverse Impacts

The Program Expansion alternative has the potential to have an adverse effect under Section 106 on the cultural landscape of the Memorial. Depending on the level of ground disturbance, the Program Expansion alternative could have unavoidable impacts on subsurface archeological resources. Adverse impacts on vegetation in East St. Louis would result from the development of design elements. In addition, the maintenance of the Memorial over time would have minor long-term adverse impacts on the soundscape of the Memorial. These impacts are considered unavoidable.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are actions that result in the permanent loss of resources. Irretrievable commitments of resources are actions that result in the loss of resources for a period of time. Construction of the various elements of the Program Expansion alternative would result in an irreversible and irretrievable commitment of resources used in the construction of the facilities. However, since these facilities would be put to beneficial use, these commitments of resources are not considered to be a significant impact of this alternative.

Relationship of Short-Term Uses and Long-Term Productivity

Jefferson National Expansion Memorial would continue to be used by the public as a cultural and recreational resource, and the National Park Service would manage the Memorial to preserve its cultural and natural resources. Actions taken under this alternative would be consistent with the NPS mission and would provide for the long-term protection of the cultural and natural resource values for which the Memorial was established.

4.5 IMPACTS OF ALTERNATIVE 4 – PORTALS

Cultural Resources

HISTORIC BUILDINGS, STRUCTURES, SITES, OBJECTS AND DISTRICTS

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Under the Portals alternative, sensitive rehabilitation and renovation of the Memorial's buildings and structures would be undertaken to improve accessibility and security, and to modestly increase heritage education. These improvements would be achieved in accordance with the *Secretary of the Interior's Standards for Rehabilitation*, and thus the NHL and the fundamental resources and values of the Memorial would be protected. In addition, all actions affecting the historic structures on the Memorial grounds or within the APE would be undertaken in consultation with the Missouri and Illinois SHPOs and the Advisory Council on Historic Preservation.

The following discussion outlines impacts on historic structures, both on-site and within the surrounding area:

Gateway Arch: Accessible entrances to the Museum of Westward Expansion are proposed under this alternative. These entrances would be constructed either at the base of the Gateway Arch or on Memorial Drive. If constructed at the base of Gateway Arch, there would be minor short- and long-term local adverse impacts on this historic structure. The construction of a new entrance to the underground complex near Memorial Drive may alter the experience of the approach to the Gateway Arch, resulting in minor to moderate long-term local adverse impacts. The renovation of facilities at the north end of the Memorial grounds would be designed in accordance with the *Secretary of the Interior's Standards for Rehabilitation* to ensure that there are no long-term adverse impacts on views to or from the Gateway Arch. The addition to the Museum of Westward Expansion would be accomplished in accordance with the *Secretary of the Interior's Standards for Rehabilitation* to ensure that long-term adverse impacts to the underground structure are

negligible. Under Section 106, there would be no adverse effect on the Gateway Arch or the Museum of Westward Expansion.

Old Courthouse: Under this alternative, the Old Courthouse would be preserved and the leaking roof would be repaired. This would result in a moderate long-term local beneficial impact on the building. West of the Gateway Arch, a nearly three-block at-grade lid would be constructed over Memorial Drive. Ventilation may be required for the lid. If the ventilation can be achieved through a below-grade apparatus, long-term local adverse impacts to the Old Courthouse would be negligible. However, if a low-scale, but still above-grade apparatus is required, it could be apparent in views from the Old Courthouse towards the Gateway Arch grounds, resulting in minor indirect long-term adverse local impacts on the Old Courthouse. Streetscape improvements proposed around the Old Courthouse would be accomplished so that the setting of the historic structure and its key features are not compromised. The construction of a below-grade visitor orientation facility at Luther Ely Smith Square may also impact the Old Courthouse. However, the modifications would be achieved in accordance with the *Secretary of the Interior's Standards for Rehabilitation* and thus adverse impacts would be negligible to minor. Under Section 106, there would be no adverse effect on the Old Courthouse.

Grand Staircase: Barrier-free routes would be provided from the Gateway Arch to the riverfront. These paths would likely be visible from the Grand Staircase, resulting in minor long-term local adverse impacts on this historic structure. However, the new access routes would be designed in accordance with the *Secretary of the Interior's Standards for Rehabilitation*, and thus there would be no adverse effect under Section 106.

North and South Overlooks: The North and South Overlooks would be renovated to accommodate heritage education and visitor amenities. In accordance with the *Secretary of the Interior's Standards for Rehabilitation*, new additions, exterior alterations, or related

new construction would not destroy historic materials, features, and spatial relationships that characterize the property. The new work would be differentiated from the old and would be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment. Thus, there would be no adverse effect under Section 106 to the North and South Overlooks.

Railroad Tunnels: There would be negligible short- or long-term local adverse impacts on the railroad tunnels. In addition, there would be no adverse effect under Section 106.

Resources within the APE: Under the Portals alternative, parking at the Old Cathedral would be moved below grade and a surface landscape treatment would be installed. This would have a minor to moderate long-term local beneficial impact on the Old Cathedral. The renovation of the current parking facility at the north end of the Memorial grounds would alter views from Eads Bridge, resulting in minor adverse to minor beneficial long-term local impacts on Eads Bridge. In addition, streetscape improvements along Washington Avenue may have negligible to minor long-term adverse impacts on the bridge, depending on the location and scope of the improvements. The renovation of the North Overlook, also visible from Eads Bridge, may result in short- and long-term minor adverse local impacts on this historic structure. There could also be long-term negligible to minor adverse local impacts on the Missouri Athletic Club Association Building and the J. Kennard and Sons Carpet Company Building, as both have visual connections to the north end of the Memorial. The Portals alternative would not directly or indirectly impact other historic structures located within the APE that are listed in the National Register or the City Landmark's registry. Under Section 106, there would be no adverse effects on historic buildings, structures, sites, objects, and districts located within the APE.

ANALYSIS OF CUMULATIVE IMPACTS

There would be minor short- and long-term local adverse impacts and minor to moderate long-term local beneficial impacts on historic

buildings and structures as a result of the implementation of the Portals alternative. These impacts, when considered together with the residential, mixed-use, and commercial developments that are planned and underway in downtown St. Louis, would not result in cumulative impacts to historic buildings, structures, sites, objects, and districts.

CONCLUSION AND IMPAIRMENT FINDING

Within the Memorial boundary, there would be short- and long-term minor local adverse impacts on the Gateway Arch. There would also be potential negligible to minor short- and long-term local adverse impacts and long-term moderate beneficial impacts on the Old Courthouse. In addition, there would be minor short- and long-term local adverse impacts on the Grand Staircase, and negligible to minor short- and long-term local adverse impacts on the North and South Overlooks. Outside of the Memorial, there would be long-term minor to moderate beneficial impacts on the Old Cathedral, and long-term minor adverse to minor beneficial impacts on Eads Bridge. There could also be long-term negligible to minor adverse local impacts on the Missouri Athletic Club Association Building and the J. Kennard and Sons Carpet Company Building. Under Section 106, there would be no adverse effect to historic buildings, structures, sites, objects, and districts. In addition, there would be no impairment of historic buildings, structures, sites, objects, and districts as a result of the Portals alternative.

CULTURAL LANDSCAPES

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Under the Portals alternative, sensitive rehabilitation and renovation of the Memorial landscape would be undertaken to improve accessibility and security, and to modestly increase heritage education. These improvements would be achieved in accordance with the *Secretary of the Interior's Standards for Rehabilitation* and the *Guidelines for the Treatment of Cultural Landscapes*, and thus the NHL and the fundamental resources and values of the Memorial would be protected.

The spatial organization of the site is of paramount importance to the maintenance of the integrity of the NHL. The proposed changes to the connections between the Old Courthouse and the Memorial, through the three-block lid and elevated pedestrian walkways, may enhance the established spatial organization of the cultural landscape along the strong east-west axis. Such a connection was envisioned within the Saarinen-Kiley concept for the Memorial, but was never completed. These changes would result in minor short-term local adverse impacts and moderate to major long-term local beneficial impacts on spatial organization at the Memorial. If the design of the landscape within Luther Ely Smith Square is enhanced through the inclusion of additional plantings consistent with the Saarinen-Kiley concept, there would be moderate to major long-term local beneficial impacts on spatial organization. The renovation of the facility at the north end of the Memorial grounds for visitor orientation would result in minor long-term local beneficial impacts if the renovated facility has a planted surface expression. The addition of new amenities at the North and South Overlooks would result in negligible to minor long-term local adverse impacts, depending on the height and scale of the proposed elements.

The essential view that stretches from the Old Courthouse east towards the Gateway Arch and the river would be enhanced by the three-block lid, as it would partially mitigate the freeway's disruption and connect the east and west portions of the Memorial grounds. The view would further be accentuated by the pedestrian bridges over Memorial Drive. These changes would result in moderate long-term local beneficial impacts. If ventilation is required for the Interstate tunnel, it could potentially impact views along the east-west axis. If possible, the ventilation would be achieved through a below-grade apparatus. If an above-grade expression is required, it would be located outside of the central east-west view corridor. Thus, long-term local impacts would be negligible to minor adverse. The construction of the below-grade visitor orientation facility at Luther Ely Smith Square may generate minor short-term local adverse

impacts resulting from construction, and minor long-term local adverse impacts due to the potential visibility of the entrance to the new facility. This impact could be partially mitigated if a vegetative screen is employed to shield this entrance. The addition of a new entrance to the expanded below-grade museum would be located in such a manner as to not disrupt the open visual axis of the cultural landscape between the Gateway Arch and the Old Courthouse.

Views along the north-south axis may also be impacted under the Portals alternative due to the renovation of the facility at the north end of the Memorial grounds. Long-term impacts may be minor, local and beneficial, if the above-grade expression of the current parking garage is replaced by a surface planted expression. The renovated facility would not obstruct views along the essential north-south axis.

Views from East St. Louis may experience both beneficial and adverse impacts under the Portals alternative. Views may improve if visitors are able to observe the Gateway Arch without the obstruction of the levee, resulting in moderate long-term beneficial impacts on this view corridor. However, new development on the west side of the river, such as infrastructure for the water taxi, may generate minor short- and long-term local adverse impacts on views from the east side of the river. To partially mitigate this impact, infrastructure for the water taxi should be located north or south of the central axis through the Gateway Arch.

New walkways and bridges around the north and south reflecting ponds may have minor short- and long-term local adverse impacts on views from the ponds. While potentially included within views of the Gateway Arch, such elements would not obstruct views of the Gateway Arch. Views north and south along the river from the overlooks could also be impacted under the Portals alternative, due to the renovation of the parking facility at the north end of the Memorial. Depending on the height and mass of the above ground expression, there may be short- and long-term minor beneficial to minor adverse impacts on these views.

The Portals alternative could also have slight impacts on the site's topography. Although below grade, the construction of the proposed visitor orientation facility at Luther Ely Smith Square may alter the topography of this portion of the site. However, the sunken garden was not part of the original Saarinen-Kiley concept, and thus long-term impacts on the cultural landscape would be negligible. The redesign of the entrances to the Gateway Arch and accessible ramps to the riverfront may cause negligible to minor long-term adverse impacts on the site's topography. The expansion of the underground museum complex would not alter the topography west of the Gateway Arch.

The Portals alternative proposes widespread changes to circulation elements at the Memorial. The addition of pedestrian bridges between Luther Ely Smith Square and the Gateway Arch (due to the fulfillment of Saarinen-Kiley Master Plan proposal) would result in moderate long-term local beneficial impacts on circulation. Enhanced connections at Pine and Walnut Streets, and general streetscape improvements have the potential to generate minor short-term adverse impacts and potential minor long-term adverse to moderate beneficial local impacts, depending on the scope of the improvements within and outside the Memorial grounds. The removal of at-grade parking at the Old Cathedral would alter the Memorial's landscape and may require additional access routes to the proposed underground parking, resulting in minor to moderate long-term local adverse impacts. However, the installation of a landscape expression in lieu of surface parking may mitigate this adverse impact. Finally, the circulation system to the north and south reflecting ponds would likely have local short-term minor adverse impacts during construction and local long-term minor adverse impacts, due to the potential location and treatment of walkways and crossings.

The potential increase in visitation at the Memorial as a result of enhanced services may support commercial activity within the surrounding neighborhood, enhancing the urban environment and resulting in minor to

moderate local long-term beneficial impacts to the natural and constructed setting. However, an increase in visitors may result in crowding and greater degradation of the landscape, resulting in a minor short-term local adverse impact on the cultural landscape, possibly leading to local minor long-term adverse impacts.

Under the Portals alternative, there would be no direct changes to the north or south reflecting ponds as part of this alternative. However, if the proposed pathways and bridges are implemented, there would be minor long-term indirect adverse impacts on the ponds.

There are no proposed changes to the existing small-scale features at the Memorial grounds, though there may be minor adverse impacts on lights and benches as a result of construction projects. These impacts may be mitigated by replacement of the features after construction.

ANALYSIS OF CUMULATIVE IMPACTS

The implementation of the Portals alternative would result in moderate to major beneficial and negligible to minor adverse short- and long-term local impacts on the cultural landscape at the Memorial. These impacts, in particular the increased wear and tear on the Memorial landscape as a result of higher visitation levels, could contribute to a minor short-term local adverse cumulative impact, when considered together with the residential, mixed-use, and commercial developments that are planned and underway in downtown St. Louis.

CONCLUSION AND IMPAIRMENT FINDING

The Portals alternative may result in local negligible to minor long-term adverse and moderate to major long-term beneficial impacts on the cultural landscape at Jefferson National Expansion Memorial. Under Section 106, there would be no adverse effect on the Memorial landscape. In addition, there would be no impairment of the historic landscape as a result of the Portals alternative.

ARCHEOLOGICAL RESOURCES

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Several components of this alternative include a ground-disturbing element which may impact buried archeological resources. These elements constitute different levels of ground disturbance and are located in areas that have varying levels of archeological sensitivity. The impact assessments consider these two factors, recognizing that elements have not yet been designed and that the precise locations of archeological resources are not known. The following table (Table 4.2) summarizes the components that are likely to disturb the ground, the archeological sensitivity of the area of disturbance, and the impact that disturbance might have on significant archeological resources. This is followed by a discussion of the activities that are likely to have the most impact on archeological resources.

Component with Potential for Ground Disturbances	Type of Disturbance Likely	Archeological Sensitivity	Impact Assessment
The north and south ends of the Memorial grounds are renovated	Moderate disturbances from renovation	Low	Negligible to Minor
Luther Ely Smith Square is redeveloped	Major disturbances for underground parking	High	Major
Increased connectivity between adjacent neighborhoods	Minor disturbance from street improvements for pedestrian access	Low to Moderate	Negligible to Minor
Increased connectivity between adjacent neighborhoods	Moderate disturbance for pedestrian overcrossings and at-grade lid	Low to High	Negligible to Moderate
Perimeter security and public safety issues continue to be addressed	Minor disturbances if additional fencing or bollards are needed	Low to High	Negligible to Minor
New entrance to Museum of Westward Expansion	Major disturbances for underground entrance	Moderate to High	Moderate to Major
Parking lot at the Old Cathedral is placed underground	Major disturbances for underground parking	Moderate to High	Moderate to Major
Entrances into the visitor center and the Museum of Westward Expansion renovated to meet codes	Minor disturbance from excavation for ADA/ABAAS-compliant railings or ramps	Low	Negligible to Minor
Entrances into the visitor center and the Museum of Westward Expansion renovated to meet codes	Moderate to major disturbances for nearby entrance creation	Moderate	Minor to Moderate
Museum of Westward Expansion is enlarged	Major disturbances for expansion	Moderate to High	Moderate to Major
Unify streetscape	Minor disturbances from installation of landscape elements, signage, etc.	Low to Moderate	Negligible to Moderate
Encourage compatible riverfront improvements	Minor to moderate disturbances from improvements compatible with the Memorial grounds	Low to Moderate	Negligible to Moderate
Develop partnership for creation of water taxi	Minor to moderate disturbances	Low to Moderate	Negligible to Moderate
Rehabilitation of the designed landscape	Minor disturbances from rehabilitation	Low to Moderate	Negligible to Moderate
Accessibility and heightened security design on all new facilities	Minor to major disturbances for ADA/ABAAS-compliant ramps or railing installation	Low to High	Negligible to Major

Table 4.2. Impacts to Archeological Resources in Alternative 4 - Portals

Many of the ground disturbing activities, such as the installation of ADA/ABAAS railings, would have at most a minor local or regional, long-term adverse impact (no adverse effect) on archeological resources under this alternative. A few of the activities, however, have the potential to cause major local or regional, long-term adverse impacts (adverse effect) on archeological resources. These include the underground parking at Luther Ely Smith Square and the Old Cathedral, and the expansion of the museum under the Gateway Arch. All of these are in areas with at least moderate sensitivity for archeological resources.

Under this alternative, the boundary of the Memorial would be amended to add approximately 50 acres in East St. Louis. This would have a moderate local or regional, long-term beneficial impact (no adverse effect) due to the fact that it would place any archeological resources that might be located on the parcel under NPS jurisdiction.

ANALYSIS OF CUMULATIVE IMPACTS

If important archeological resources are encountered as a result of this alternative, cumulative impacts would occur from the incremental impact of this alternative when added to other past, present, and foreseeable future actions. The geographic area that was considered for cumulative impacts on this alternative consists of historic downtown St. Louis and the East St. Louis riverfront area.

In general, impacts on archeological sites can be mitigated by data collection although that data collection, along with subsequent development of the site, causes the destruction of that archeological site. Because of the likelihood that past, present, and foreseeable future actions in the cumulative study area would impact archeological resources, any adverse impacts on archeological sites discovered as a result of this alternative would have a moderate local long-term cumulative impact.

CONCLUSION AND IMPAIRMENT FINDING

Overall, the Portals alternative would have local, long-term impacts on archeological resources that could range from minor beneficial to major adverse. Under Section 106, these would range from no adverse effects to adverse

effects. Adverse effects on archeological resources could be avoided through mitigation and by having cultural resource observers present during ground disturbing activities in areas likely to contain archeological resources. Mitigation of impacts would ensure that there would be no impairment of archeological resources.

Activities occurring on the western portion of the Memorial grounds are expected to have a greater likelihood of encountering archeological resources since the original historic grade is near the surface in this area. If archeological sites were discovered during construction activities, and the sites were recorded, such findings could yield beneficial information regarding the history or prehistory of the area. The recording and/or preservation of previously undiscovered sites would be considered a beneficial impact.

CURATORIAL RESOURCES AND MUSEUM COLLECTIONS

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Under the Portals alternative, the exhibits at the Old Courthouse and in the Museum of Westward Expansion would be redesigned to provide more interactive and engaging experiences for visitors. In addition, the existing museum would be renovated and expanded, and a new state-of-the-art storage facility for collections and archives would be provided. The provision of more up-to-date exhibits and archivally sound storage area for collections would result in moderate long-term beneficial impacts on curatorial resources and museum collections.

ANALYSIS OF CUMULATIVE IMPACTS

Under the Portals alternative, there would be moderate long-term beneficial impacts on curatorial resources and museum collections. These impacts, when considered together with projects planned or ongoing within the surrounding area, would not contribute to cumulative impacts on museum collections.

CONCLUSION AND IMPAIRMENT FINDING

The implementation of the Portals alternative would result in moderate long-term beneficial

impacts on curatorial resources and museum collections. There would be no impairment of curatorial resources and museum collections as a result of the Portals alternative.

Natural Resources

VEGETATION

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Minor to moderate impacts on vegetation in the East St. Louis addition would occur as a result of clearing related to construction of new facilities. However, this would also create opportunities to restore and enhance the planting in these areas. Negligible to moderate impacts might occur as a result of the design competition. Since this area is currently dominated by early successional or invasive species, overall impacts would be beneficial.

ANALYSIS OF CUMULATIVE IMPACTS

Past land use practices have completely removed the original forested land cover of the St. Louis/East St. Louis area and created the urban/developed land cover that exists today. Since impacts on vegetation communities within the study area would generally be considered beneficial due to the removal of invasive species, there would be no cumulative impacts on vegetation communities.

CONCLUSION AND IMPAIRMENT FINDING

The Portals alternative would have long-term beneficial to short-term moderate adverse impacts on the vegetation communities of the East St. Louis addition. Long-term beneficial impacts would result from the removal of invasive species; however, there would be a short-term temporary disruption of the successional habitat community. Overall, the Portals alternative would have a beneficial impact on vegetation communities within the study area.

THREATENED AND ENDANGERED SPECIES

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

The current location of the federally designated Threatened decurrent false aster on

the east bank of the Mississippi River below the levee is outside of the area to be impacted under the Portals alternative, at least in the short term. Current plans for the Portals alternative designate the east bank of the river for streetscape/riverscape improvements at some point in the future; however, the presence of the decurrent false aster in the area would necessitate a field survey to establish its precise location and extent of locally available habitat to be protected. If a new dock for the water taxi were to be constructed on the east bank of the Mississippi River, there could be construction impacts within areas of potential habitat for the decurrent false aster. However, surveys would be conducted prior to construction to determine whether or not the species is present. Thus, the Portals alternative is not likely to adversely affect this species.

ANALYSIS OF CUMULATIVE IMPACTS

Surveys for local populations of decurrent false aster would be conducted prior to construction. In addition, none of the projects considered as part of the cumulative impacts analysis are located on the east side of the river where the current local population is present. Thus, there would be no cumulative impacts on the decurrent false aster as a result of the Portals alternative.

CONCLUSION AND IMPAIRMENT FINDING

There would be no additional development, loss of habitat, or changes in maintenance or management practices in the near term in areas that may disturb decurrent false aster populations present on the east side of the River. Any future development that may occur along the east bank of the Mississippi River would be preceded by a site survey to identify the exact location of the species and any available habitat to be protected. Thus, there would be no impact on this threatened species and no impairment of Memorial resources within the study area.

SOUNDSCAPE

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

There would be minor short-term adverse impacts on the soundscape of the Memorial

from the construction of the pedestrian enhancements, streetscape improvements, riverfront improvements, pedestrian bridges over Memorial Drive, nearly three-block lid over I-70, accessible ramps to the riverfront, recreational vehicle parking area, below-grade parking areas at Luther Ely Smith Square and the Old Cathedral, below-grade visitor orientation facilities, and the expanded underground Museum of Westward Expansion. Noise from these activities would be greatest in the immediate vicinity of the construction activity and would diminish as visitors migrate from the activity. Given the existing background noise levels throughout much of the Memorial grounds, noise from construction would only be periodically discernable above background noise levels, and would generally not interfere with a user's enjoyment of the Memorial. Construction activities in the west-central portion of the Memorial grounds may cause individuals to avoid this area during the construction period.

There would be continuing minor long-term adverse impacts on the soundscape of the Memorial from the existing maintenance-related activities on the Memorial grounds, including lawn mowing and testing of the emergency generators. Implementation of a visitor transportation system would introduce a new noise source to the Memorial grounds and the surrounding streets. Implementation of the water taxi service between the Memorial and the East St. Louis addition would introduce a new noise source to the Mississippi River and the riverfront area. The long-term adverse impacts on the soundscape associated with the visitor transportation system and the water taxi service are expected to be minor.

Increased visitation and vehicular traffic on the Memorial grounds and the East St. Louis addition would result in a minor long-term adverse impact on the soundscape of these areas. There would be minor long-term adverse impacts on the soundscape resulting from increased vehicular traffic entering and exiting the new parking garages at Luther Ely Smith Square and the Old Cathedral, and the renovated parking structure at the north end of the Memorial.

The addition of the nearly three-block lid over I-70 may have a minor to moderate beneficial impact on the soundscape of Luther Ely Smith Square and the central portion of the Memorial grounds. The lid would cover much of the depressed section of I-70 and would dampen much of the reflected traffic noise from this portion of the freeway. There may be a slight increase in traffic noise at the tunnel entrances as a result of the lid; however, the overall impact of the lid on the soundscape of the Memorial is expected to be beneficial.

ANALYSIS OF CUMULATIVE IMPACTS

There may be minor adverse and minor to moderate beneficial impacts on the soundscape as a result of the implementation of the Portals alternative. These impacts, when considered together with that of ongoing or planned projects in the vicinity of the Memorial may contribute to a minor adverse cumulative impact on the soundscape of the Memorial.

CONCLUSION AND IMPAIRMENT FINDING

The Portals alternative would have minor short-term adverse impacts on the soundscape from the construction of the pedestrian enhancements, streetscape improvements, riverfront improvements, pedestrian bridges over Memorial Drive, a nearly three-block lid over I-70, accessible ramps to the riverfront, recreational vehicle parking area, below-grade parking areas at Luther Ely Smith Square and the Old Cathedral, below-grade visitor orientation facilities, and the expanded underground Museum of Westward Expansion. There would also be continuing minor long-term adverse impacts on the soundscape from existing maintenance activities. Implementing a water taxi and visitor transportation system would result in minor long-term adverse impacts on the soundscape.

The addition of the nearly three-block lid over I-70 may have a minor to moderate long-term beneficial impact on the soundscape of the Memorial grounds, potentially improving visitor experience of the Memorial. There would be no impairment of the soundscape of the Memorial resulting from this alternative.

Visitor Opportunities and Use

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

The focus of the Portals alternative is to revitalize the Memorial through enhanced visual and physical connections with surrounding downtown neighborhoods and East St. Louis. Changes implemented under this alternative would be expected to have moderate beneficial long-term impacts on visitor opportunities. Visitor opportunities are expected to improve with the redesign of exhibits, including more interactive experiences at the Museum of Westward Expansion and at the Old Courthouse. Visitor experiences are expected to improve with the development of barrier-free access to the riverfront and the Museum of Westward Expansion, including a new entrance on Memorial Drive. Also, visitors would be able to access the Memorial from East St. Louis via a water taxi. Visitors would have more opportunities for heritage education and orientation with new facilities developed at Luther Ely Smith Square, the north end of the site, and the North and South Overlooks. Visitors would continue to have access to recreational activities on the surface of the Memorial grounds. Short-term adverse impacts may also occur during peak periods due to crowding at popular sites.

Implementation of the Portals alternative may have a short- and long-term moderate beneficial impact on visitor use. The rehabilitation of exhibits and the introduction of more interactive experiences may encourage more repeat visitors to the site, increase the number of first-time visitors, and/or encourage visitors to extend their stay while at the Memorial. In addition, the development of barrier-free and ADA/ABAAS-compliant access to the Memorial and the addition of more special events may encourage more visitors to the site.

ANALYSIS OF CUMULATIVE IMPACTS

The increased connectivity and provision of new access points would improve visitor experience both within and outside the Memorial grounds. These connections may introduce visitors to amenities in other parts of downtown and East St. Louis, causing a beneficial cumulative impact on local businesses. In addition, individuals visiting or working in down-

town are more likely to visit the Memorial under these conditions. Overall, this alternative would create a beneficial cumulative impact on visitor use and experience of downtown St. Louis and East St. Louis.

CONCLUSION

Implementation of alternative 4 may have moderate long-term beneficial impacts on visitor opportunity and use. Visitor opportunities and use are expected to improve with the redesign of exhibits at the Museum of Westward Expansion and the Old Courthouse. Visitor experiences are expected to improve with the development of barrier-free access to the riverfront and museum including a new entrance on Memorial Drive. Improvements in streetscapes, the introduction of a new transportation system, and a water taxi service are expected to increase connectivity to local neighborhoods in downtown St. Louis and East St. Louis, and have a long-term beneficial impact on visitor opportunities and use.

Transportation and Access

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Under the Portals alternative, several changes may occur that would impact the roadway network surrounding the Memorial. The most significant impact would be the construction of a three-block, at-grade lid centered on the Old Courthouse over I-70. The construction of the lid would have a short-term moderate adverse impact on vehicular traffic on the Interstate, as well as a moderate short-term adverse impact on vehicular traffic on Memorial Drive. In the long term, the level of service on Memorial Drive would experience a minor to moderate adverse impact, due to the improved pedestrian connections across Memorial Drive. While improving the pedestrian and visitor experience, these changes would lead to increased vehicular delay and lower speeds on Memorial Drive, and this would be considered an adverse impact on traffic flow. However, since the visitor experience would be greatly enhanced, these changes would have an overall beneficial impact.

Public transportation would experience a moderate beneficial long-term impact under

this alternative. Two projects in particular would increase the volume of potential users of public transportation. The first is the reconstruction of the Arch Parking Garage at the north end of the Memorial to put parking facilities below grade, allowing for a better connection to the existing Metro station at Eads Bridge. The second, more substantial project would be the implementation of a visitor transportation system, which would link attractions within and outside the Memorial. Envisioned as a rubber-tired trolley or bus, the proposed visitor transportation system would operate on a circuit around the Memorial and key stops within downtown St. Louis. This transportation system is envisioned to operate at 15- to 20-minute intervals and in partnership with downtown business organizations and/or Metro.

The nearly three-block lid over Memorial Drive, the two elevated pedestrian bridges, and the enhanced connections at Pine and Walnut streets, combined with a new visitor entrance on Memorial Drive would result in a major positive impact on pedestrian circulation. The enhanced connections to Laclede's Landing and to downtown at the Northwest Plaza would contribute to improved pedestrian circulation conditions as well.

This alternative would improve parking near the Memorial due to the construction of parking under Luther Ely Smith Square and a new underground parking facility that would replace the existing parking lot at the Old Cathedral. The reconstruction of the Arch Parking Garage to include oversize recreational vehicle parking would result in a moderate beneficial impact. There would be a minor seasonal impact on visitor parking demand due to the implementation of a water taxi across the river. Improving bus drop-off at the Old Cathedral would also have a minor beneficial impact.

ANALYSIS OF CUMULATIVE IMPACTS

The cumulative impacts of the Portals alternative on the transportation resources of the Memorial would be minor to moderate long-term and beneficial. Current investments in downtown St. Louis would require changes to the transportation and circulation patterns there, such as the potential removal

of one-way streets and increased demands on parking facilities. Changes to transportation resulting from this alternative would build upon the ongoing trends in downtown St. Louis, particularly the improved pedestrian environment.

CONCLUSION

The Portals alternative would result in minor to moderate long-term local beneficial impacts on transportation on and around the Memorial. This determination is due to significant improvements to pedestrian circulation and parking resources, as well as the implementation of a visitor transportation system.

Socioeconomics

SOCIOECONOMICS

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Implementing the Portals alternative would increase expenditures on operations and staffing over those estimated under the no action alternative. Annual expenditures are expected to increase by \$6.3 million to over \$26.1 million total when all programs are implemented, while staffing is estimated to increase by an additional 77 FTE over the no action alternative. Increases in expenditures and staffing would have minor beneficial long-term economic impacts on the region, as more federal expenditures are made in the local area and future employees spend their incomes near their place of employment and residence.

Under the Portals alternative, it is expected that visitation to the Memorial would increase above the baseline conditions of the no action alternative. Minor to moderate increases in visitation to the Memorial are anticipated due to the expansion of special events and addition of a water taxi to East St. Louis. In addition, increased connectivity at Memorial Drive, Washington Avenue, and Laclede's Landing would likely improve access and support of local businesses by visitors. These actions would have a minor positive long-term economic impact, with impacts limited to a small geographic area immediately adjacent to the Memorial. A new visitor transportation system would have a minor to moderate beneficial economic impact on downtown

St. Louis, depending on the route. If the route extends to other major attractions and locations in the city, visitors would likely prolong their stays and patronage to more local businesses throughout downtown.

ANALYSIS OF CUMULATIVE IMPACTS

The implementation of the Portals alternative would have a minor to moderate beneficial economic impact. When this impact is considered together with other ongoing and planned projects in the study area, this could result in a minor long-term beneficial cumulative impact to socioeconomic resources, with impacts limited to businesses in the downtown area.

CONCLUSION

Management of the Memorial and the East St. Louis addition would focus on improving physical and visual connections from the surrounding neighborhoods. The Memorial would continue to be a major attraction for visitors coming to the St. Louis area, and its appeal to local residents and visitors is expected to have a minor beneficial increase in visitation under this alternative. Visitation to the Memorial would have a long-term minor beneficial economic impact due to visitor spending and expenditures associated with operations at the Memorial, though the impact would be focused within the local geographic area. Cumulative impacts from other projects may increase visitation to the Memorial and downtown, which would have a minor beneficial impact on downtown retailers and businesses.

LAND USE

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Implementation of alternative 4, with its emphasis on portals into the Memorial, may have beneficial impacts on land use. Improving access to the Memorial through the development of barrier-free entrances and improved visitor screening and security would improve land use within the Memorial. Development of a nearly three-block lid and pedestrian walkways would have beneficial long-term impacts on land use by improving the connectivity of the Memorial with other parts of downtown.

Reconstructing the parking lot at the Old Cathedral as an underground facility would have a long-term local beneficial impact on land use by renovating the surface to accommodate bus/shuttle drop-off and re-designing the surface to be more compatible with surrounding land use. A long-term moderate local adverse impact on land use may occur with the development of a new barrier-free entrance to the underground museum on Memorial Drive, with the removal of existing greenspace. Expansion of the Memorial's boundary to include 50 additional acres in East St. Louis would have moderate long-term local beneficial impacts on land use. The National Park Service would be able to influence development of areas along the east bank of the Mississippi River that are compatible with the existing Memorial grounds on the west side of the river, as well as land uses planned by Metro Parks for park facilities on the east side of the river.

ANALYSIS OF CUMULATIVE IMPACTS

Implementation of the Portals alternative may have positive long-term impacts on land use within and outside the Memorial. When these impacts are considered together with recently completed, ongoing, and planned projects in the area, there may be a minor beneficial impact on land use by further connecting uses at the Memorial with other compatible uses outside the Memorial grounds. NPS actions in East St. Louis would not only enhance the land uses planned by Metro Parks, but may also encourage other partnerships, further developing the area with compatible uses and consequently linking the east and west side of the river.

CONCLUSION

Implementation of the Portals alternative is expected to have a long-term moderate beneficial impact on local land use. While the development of a new barrier-free entrance to the underground museum would have adverse impacts in the loss of green space, those impacts are expected to be localized to that specific area of the Memorial grounds. Beneficial impacts are expected to occur with the development of a nearly three-block deck of Memorial Drive and pedestrian walkways, improving compatibility of the Memorial with

adjacent major roadways. Moderate beneficial impacts would also occur with the expansion of the Memorial's boundary into East St. Louis, encouraging compatible development with Metro Parks and other potential partners.

NPS Operations

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

The changes proposed in the Portals alternative would have moderate to major adverse impacts on the operational resources of the Memorial. According to analysis provided by current staff at the Memorial, the changes to the operation of the Memorial related to this alternative would require an increase of 77 additional FTE. An expanded visitor center and museum with new entrance on Memorial Drive, the below-grade expansion at Luther Ely Smith Square, the water taxi, the reconstructed Arch Parking Garage, and the expansion on the East St. Louis side of the Mississippi River would all require additional operational resources. Therefore, the direct impact would be moderate to major long-term and adverse.

ANALYSIS OF CUMULATIVE IMPACTS

Given the current underfunding of operations at the Memorial, the proposed expansion of programs and facilities at the Memorial would have moderate adverse impacts. These impacts, when considered with other ongoing and planned projects, could contribute to a cumulative impact to operations, since the projects outside of the Memorial grounds could increase the number of people living in or visiting the downtown, and thus the number of people visiting the Memorial.

CONCLUSION

The long-term impacts of the Portal alternative would be moderate and adverse. The expanded facilities would require a commensurate increase in NPS operational resources.

Unavoidable Adverse Impacts

Depending on the level of ground disturbance, the Portals alternative could have unavoidable impacts on subsurface archeological resources. Adverse impacts on vegetation would result

from the continued use of the Memorial by visitors. In addition, the maintenance of the Memorial over time would have minor long-term adverse impacts on the soundscape of the Memorial. These impacts are considered unavoidable.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are actions that result in the permanent loss of resources. Irretrievable commitments of resources are actions that result in the loss of resources for a period of time. Construction of the various elements of the Portals alternative would result in an irreversible and irretrievable commitment of resources used in the construction of the facilities. However, since these facilities would be put to beneficial use, these commitments of resources are not considered to be a significant impact of this alternative.

Relationship of Short-Term Uses and Long-Term Productivity

Jefferson National Expansion Memorial would continue to be used by the public as a cultural and recreational resource, and the National Park Service would manage the Memorial to preserve its cultural and natural resources. Actions taken under this alternative would be consistent with the NPS mission and would provide for the long-term protection of the cultural and natural resource values for which the Memorial was established.

4.6 IMPACTS OF ALTERNATIVE 5 – PARK INTO THE CITY

Cultural Resources

HISTORIC BUILDINGS, STRUCTURES, SITES, OBJECTS AND DISTRICTS

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Under the Park into the City alternative, sensitive rehabilitation and renovation of the Memorial's buildings and structures would be undertaken to improve accessibility and security, and to modestly increase heritage educa-

tion. These improvements would be achieved in accordance with the *Secretary of the Interior's Standards for Rehabilitation*, and thus the NHL and the fundamental resources and values of the Memorial would be protected. In addition, all actions affecting the historic structures on the Memorial grounds or within the APE would be undertaken in consultation with the Missouri and Illinois SHPOs and the Advisory Council on Historic Preservation.

The following discussion outlines impacts on historic buildings, structures, sites, objects, and districts, both on-site and within the surrounding area:

Gateway Arch: The existing ramps and stairs at the entrances to the Museum of Westward Expansion would be redesigned to meet ADA/ABAAS universal design standards. This would generate minor short- and long-term adverse impacts on the Gateway Arch. The renovation of facilities at the north end of the Memorial grounds, and the construction of a new education and research facility at the south end of the Memorial grounds would be accomplished in accordance with the *Secretary of the Interior's Standards for Rehabilitation*. Thus, new additions, exterior alterations, or related new construction would not destroy historic materials, features, and spatial relationships that characterize the property. The new work would be differentiated from the old and would be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment. There would be negligible long-term local impacts on views to or from the Gateway Arch as a result of the new and renovated buildings. Under Section 106, there would be no adverse effect on the Gateway Arch.

Old Courthouse: Under this alternative, the Old Courthouse would be preserved and the leaking roof would be repaired. This would result in a moderate long-term local beneficial impact on the building. West of the Gateway Arch, Memorial Drive would be rerouted away from the Memorial grounds between Poplar and Locust streets. With the removal of this major thoroughfare from within the Memorial's boundary, the axial connection between the Old Courthouse and the Gateway Arch would

be strengthened, resulting in minor long-term beneficial local impacts to this historic resource. I-70 would remain below grade, but would be housed within a tunnel that would require ventilation. If the ventilation can be achieved through a below-grade apparatus, long-term local adverse impacts to the Old Courthouse would be negligible. However, if a low scale, but still above-grade apparatus is required, it could be apparent in views from the Old Courthouse towards the Gateway Arch, resulting in minor indirect long-term adverse local impacts on the Old Courthouse. Streetscape improvements proposed around the Old Courthouse may result in negligible to minor long-term adverse impacts, but would be accomplished so that the setting of the historic structure and its key features are not compromised. Under Section 106, there would be no adverse effect on the Old Courthouse.

Grand Staircase: Barrier-free routes would be provided from the Gateway Arch to the riverfront. These paths would likely be visible from the Grand Staircase, resulting in minor short- and long-term local adverse impacts on this historic structure. However, the new access routes would be designed in accordance with the *Secretary of the Interior's Standards for Rehabilitation*, and thus there would be no adverse effect under Section 106.

North and South Overlooks: The renovation of the existing facility at the north end of the Memorial may result in indirect impacts on the North Overlook. These short- and long-term local impacts may range from minor beneficial to minor adverse in intensity, depending on the surface expression of the renovated structure. At the South Overlook, the construction of a new education and research center may result in short- and long-term minor beneficial to minor adverse local impacts. Although these renovated or new facilities would be visible from the North and South Overlooks, they would not block key historic designed views to the Gateway Arch or to the river. There would be no adverse effect on the North and South Overlooks under Section 106.

Railroad Tunnels: There would be negligible short- or long-term adverse impacts on the

railroad tunnels. In addition, there would be no adverse effect under Section 106.

Resources within the APE: The renovation of the current parking facility at the north end of the Memorial grounds would alter views from Eads Bridge, resulting in minor adverse to minor beneficial long-term local impacts on Eads Bridge. In addition, streetscape improvements along Washington Avenue may have negligible to minor long-term adverse impacts on the bridge, depending on the location and scope of the improvements. The renovation of the North Overlook, also visible from Eads Bridge, may result in short- and long-term minor adverse local impacts on the bridge. There could also be long-term negligible to minor adverse local impacts on the Missouri Athletic Club Association Building and the J. Kennard and Sons Carpet Company Building, as both have visual connections to the north end of the Memorial. The relocation of the maintenance facility, potentially to a site within Chouteau's Landing, may result in negligible to minor adverse short- and long-term visual impacts on the Crunden-Martin Manufacturing Company Historic District and St. Mary of Victories Church. The degree of impact on these resources would depend on the location of the maintenance facility, and whether the National Park Service employs an existing structure or builds a new facility. The Park into the City alternative would not directly or indirectly impact other historic buildings, structures, sites, objects, or districts located within the APE that are listed in the National Register. Under Section 106, there would be no adverse effects on historic buildings, structures, sites, objects and districts located within the APE.

ANALYSIS OF CUMULATIVE IMPACTS

There would be minor to moderate long-term beneficial impacts and minor short- and long-term adverse impacts on historic buildings, structures, sites, objects, and districts as a result of the implementation of the Park into the City alternative. These impacts, when considered together with the residential, mixed-use, and commercial developments that are planned and underway in downtown St. Louis, would not result in cumulative impacts on historic buildings and structures.

CONCLUSION AND IMPAIRMENT FINDING

Within the Memorial boundary, there would be minor short- and long-term adverse impacts on the Gateway Arch. There would also be potential minor short- and long-term adverse impacts and moderate beneficial long-term impacts on the Old Courthouse. In addition, there would be minor short- and long-term adverse impacts on the Grand Staircase. Outside of the Memorial, there would be short- and long-term minor adverse to minor beneficial impacts on Eads Bridge. There could also be long-term negligible to minor adverse local impacts on the Missouri Athletic Club Association Building and the J. Kennard and Sons Carpet Company Building, as both have visual connections to the north end of the Memorial. Further, there may be negligible to minor long-term local adverse impacts on the Crunden-Martin Manufacturing District and St. Mary of Victories Church. Under Section 106, there would be no adverse effects to these historic resources. In addition, there would be no impairment to historic buildings, structures, sites, objects, and districts as a result of the Park into the City alternative.

CULTURAL LANDSCAPES

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Under the Park into the City alternative, sensitive rehabilitation and renovation of the Memorial landscape would be undertaken to improve accessibility and security, and to modestly increase heritage education. The visitor experience would be extended into the downtown and Memorial Drive would be rerouted, allowing for a series of plazas. These improvements would be achieved in accordance with the *Secretary of the Interior's Standards for Rehabilitation*, and thus the NHL and the fundamental resources and values of the Memorial would be protected.

The spatial organization of the site is of paramount importance to the maintenance of the integrity of the NHL. The proposed changes to the connections between the Old Courthouse and the Memorial, through the rerouting of Memorial Drive and the establishment of at-grade plazas, have the potential to enhance the spatial organization of the Memorial.

These changes would result in moderate to major long-term beneficial local impacts, as the east and west portions of the Memorial grounds would be unified. If the design of the landscape within Luther Ely Smith Square is enhanced through the inclusion of additional plantings consistent with the Saarinen-Kiley concept, there would be moderate to major long-term local beneficial impacts on spatial organization. The renovation of the facility at the north end of the Memorial for heritage education/visitor amenities, and the construction of a new research center at the south end of the Memorial, may result in moderate long-term local beneficial impacts if the facilities have a planted expression at grade.

The essential view that stretches from the Old Courthouse east towards the Gateway Arch and the river would be enhanced by the relocation of Memorial Drive, as it would mitigate the freeway's disruption and connect the east and west portions of the Memorial grounds. These changes would result in moderate to major long-term local beneficial impacts. If ventilation is required for the I-70 tunnel, it could potentially impact views along the east-west axis. If possible, the ventilation would be achieved through a below-grade apparatus. If an above-grade expression is required, it would be located outside of the central east-west view corridor. Thus, long-term local impacts would be negligible to minor adverse.

Views along the north-south axis may also be impacted under the Park into the City alternative due to the renovation of the facility at the north end of the Memorial. Long-term impacts may be minor, local and beneficial, if the above-grade expression of the current parking garage is replaced by a surface planted expression. The renovated facility would not obstruct views along the essential north-south axis.

Views from East St. Louis back towards the Gateway Arch may be improved if an education facility is constructed on the east side of the river, as visitors may view the Gateway Arch without the obstruction of the levee. Local impacts would be long-term and moderate beneficial. Views from the North and South Overlooks along the river could be impacted by construction at the north and south ends of the Memorial. Depending on the height and

mass of the above-ground expression, there may be short- and long-term minor beneficial to minor adverse local impacts on these views.

The Park into the City alternative could also result in modest changes to the site's topography. The construction of a new research center at the south end of the Memorial may result in slight changes to the topography, depending on the design of the new facility; long-term local adverse impacts would be negligible to minor. The redesign of the entrances to the Gateway Arch and accessible ramps to the riverfront may cause negligible to minor long-term adverse impacts on the site's topography.

The relocation of Memorial Drive and the creation of at-grade plazas would result in minor local short-term adverse impacts and moderate long-term local beneficial impacts on circulation. Enhanced connections at Pine and Walnut Streets and general streetscape improvements have the potential to generate minor short-term adverse impacts and potential minor adverse to moderate beneficial impacts, depending on the scope of the improvements within and outside the Memorial grounds. The removal of at-grade parking at the Old Cathedral and the installation of a landscape expression in its place would result in a minor long-term beneficial local impact.

The potential increase in visitation at the Memorial resulting from the implementation of the Park into the City alternative may increase commercial activity within the surrounding neighborhood, enhancing the urban environment and resulting in minor to moderate long-term beneficial impacts to the Memorial's constructed setting. However, the increase in visitors may result in crowding and greater degradation of the landscape, resulting in a minor short-term adverse impact on the cultural landscape, possibly leading to minor long-term adverse impacts.

Under the Park into the City alternative, there are no proposed changes to the existing small-scale features at the Memorial grounds, though there may be minor adverse impacts on lights and benches as a result of construction

projects. These impacts may be mitigated by replacement of the features after construction.

ANALYSIS OF CUMULATIVE IMPACTS

The implementation of the Park into the City alternative would result in long-term moderate to major beneficial and minor adverse impacts on the cultural landscape at the Memorial. Additional visitation at the Memorial, when viewed together with the residential, mixed-use, and commercial developments that are planned and underway in downtown St. Louis, may generate minor short-term adverse cumulative impacts on the landscape through additional degradation.

CONCLUSION AND IMPAIRMENT FINDING

The Park into the City alternative may result in long-term moderate to major beneficial and minor adverse local impacts on the cultural landscape at Jefferson National Expansion Memorial. Under Section 106, there would be no adverse effect on the Memorial landscape. In addition, there would be no impairment of

the historic landscape as a result of the Park into the City alternative.

ARCHEOLOGICAL RESOURCES

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Several components of this alternative include ground-disturbing activities which may impact buried archeological resources. These elements constitute different levels of ground disturbance and are located in areas that have varying levels of archeological sensitivity. The impact assessments take these two factors into account, recognizing that most elements have not yet been designed and that the precise locations of archeological resources are not known. The following table (Table 4.3) summarizes the components that are likely to disturb the ground, the archeological sensitivity of the area of disturbance, and the impact that disturbance might have on significant archeological resources. This is followed by a discussion of the activities that are likely to have the most impact on archeological resources.

Component with Potential for Ground Disturbances	Type of Disturbance Likely	Archeological Sensitivity	Impact Assessment
Remove Memorial Drive	Moderate to major disturbances assumed to be mostly within street right-of-way	Low to Moderate	Negligible to Minor
North and south ends zoned for amenities	Minor to moderate disturbances	Low to Moderate	Negligible to Minor
Parking lot at the Old Cathedral is eliminated	Minor disturbances from landscaping and resurfacing	Moderate to High	Minor to Moderate
Unify streetscape	Minor disturbances from installation of landscape elements, signage, etc.	Low to moderate	Negligible to Moderate
Encourage compatible riverfront improvements	Minor to moderate disturbances from improvements compatible with the Memorial grounds	Moderate	Negligible to Moderate
Move maintenance facility	Major disturbances from footings/foundation for new facility	Low to High (depending on placement of facility)	Negligible to Major
Rehabilitation of the designed landscape and structures	Minor disturbances from rehabilitation	Low to Moderate	Negligible to Moderate
Accessibility and heightened security design on all new facilities	Minor to major disturbances for ADA/ABAAS-compliant railing installation	Low to High	Negligible to Major

Table 4.3. Impacts to Archeological Resources in Alternative 5 - Park into the City

Several of the ground-disturbing activities proposed under the Park into the City alternative have the potential to cause major long-term adverse impacts (adverse effect) on archeological resources if these activities are conducted in areas of high sensitivity. These include the relocation of the maintenance facility (especially if it is moved to an area of high archeological sensitivity) and the renovation of the parking garage to a multimodal transportation facility.

One of the elements of this alternative is that the boundary of the Memorial would be amended to add approximately 100 acres in East St. Louis. This would represent a moderate local or regional, long-term beneficial impact (no adverse effect) since it would place any archeological resources that might be located on the parcel under NPS jurisdiction and therefore would be protected by federal law.

ANALYSIS OF CUMULATIVE IMPACTS

If important archeological resources are encountered as a result of this alternative, cumulative impacts would occur from the incremental impact of this alternative when added to other past, present, and foreseeable future actions. The geographic area that was considered for cumulative impacts on this alternative consists of historic downtown St. Louis and the East St. Louis riverfront area.

In general, impacts on archeological sites are mitigated by data collection, and recording of that data prior to site development. Because of the likelihood that past, present, and foreseeable future actions in the study area would impact archeological resources, any adverse impacts on archeological sites discovered as a result of this alternative would have a moderate local long-term cumulative impact.

CONCLUSION AND IMPAIRMENT FINDING

Overall, the Park into the City alternative would have local long-term impacts ranging from minor beneficial to major adverse. Under Section 106, these would range from no adverse effects to adverse effects. Adverse effects on archeological resources could be avoided through mitigation and by having cultural resource observers present during ground disturbing activities in areas likely to

contain archeological resources. Mitigation of impacts would ensure that there would be no impairment of archeological resources.

Activities occurring on the western portion of the Memorial Grounds are expected to have a greater likelihood of encountering archeological resources since the original historic grade is near the surface in this area. If archeological sites were discovered during construction activities, and the sites were recorded, such findings could yield beneficial information regarding the history or prehistory of the area. The recording and/or preservation of previously undiscovered sites would be considered a beneficial impact.

Out of all of the alternatives, the Park into the City alternative has the lowest potential for an adverse impact on archeological resources because it has fewer components that may cause large disturbances in areas with high archeological sensitivity.

The impacts identified for this alternative are a result of ground disturbing activities which may encounter significant archeological resources. Depending on the size of the disturbance, these activities would have a local or regional, long-term adverse impact ranging from minor (no adverse effect) to major (adverse effect). The range of potential impacts under this alternative is due, in part, to the lack of specific information regarding the location of the maintenance facility. These impacts would need to be further refined once the location for the maintenance facility has been identified.

CURATORIAL RESOURCES AND MUSEUM COLLECTIONS

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Under the Park into the City alternative, the exhibits at the Old Courthouse and in the Museum of Westward Expansion would be redesigned to provide more interactive and engaging experiences for visitors. In addition, a new state-of-the-art storage facility for collections and archives would be provided and a new education and research facility would be constructed at the south end of the Memorial grounds. The provision of more up-to-date

exhibits and an archivally sound storage area for collections would result in local long-term moderate beneficial impacts on curatorial resources and museum collections.

ANALYSIS OF CUMULATIVE IMPACTS

Under the Park into the City alternative, there would be local moderate long-term beneficial impacts on curatorial resources and museum collections. These impacts, when considered together with projects planned or ongoing within the surrounding area, would not contribute to cumulative impacts on museum collections.

CONCLUSION AND IMPAIRMENT FINDING

The implementation of the Park into the City alternative would result in local moderate long-term beneficial impacts on curatorial resources and museum collections. There would be no impairment of curatorial resources and museum collections as a result of the Park into the City alternative.

Natural Resources

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Minor to moderate impacts on vegetation in the East St. Louis addition would occur as a result of clearing related to construction of new facilities. However, this would also create opportunities to restore and enhance the planting in these areas. Negligible to moderate impacts might occur as a result of the design competition. Since this area is currently dominated by early successional or invasive species, overall impacts would be beneficial.

ANALYSIS OF CUMULATIVE IMPACTS

Past land use practices have completely removed the original forested land cover of the St. Louis/East St. Louis area and created the urban/developed land cover that exists today. Since impacts on vegetation communities within the study area would generally be considered beneficial due to the removal of invasive species, there would be no cumulative impacts on vegetation communities.

CONCLUSION AND IMPAIRMENT FINDING

The Park into the City alternative would have long-term beneficial to short-term moderate adverse impacts on the vegetation communi-

ties of the East St. Louis addition. Long-term beneficial impacts would result from the removal of invasive species; however, there would be a short-term temporary disruption of the successional habitat community. Overall, the Park into the City alternative would have a minor to moderate beneficial impact on vegetation communities within the study area.

THREATENED AND ENDANGERED SPECIES

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

The current location of the federally designated Threatened decurrent false aster on the east bank of the Mississippi River below the levee is outside of the area to be impacted under the Park into the City alternative, at least in the short term. Current plans for the Park into the City alternative designate the east bank of the river for streetscape/riverscape improvements at some point in the future; however, the presence of the decurrent false aster in the area would necessitate a field survey to establish its precise location and extent of locally available habitat to be protected. Thus, the Park into the City alternative is not likely to adversely affect this species.

ANALYSIS OF CUMULATIVE IMPACTS

Surveys for local populations of decurrent false aster would be conducted prior to construction and avoiding potential habitat areas would mitigate the potential for impacts to this species. In addition, none of the projects considered as part of the cumulative impacts analysis are located on the east side of the river where the current local population is present. Thus, there would be no cumulative impacts on the decurrent false aster as a result of the Park into the City alternative.

CONCLUSION AND IMPAIRMENT FINDING

There would be no additional development, loss of habitat, or changes in maintenance or management practices in the near term in areas that may disturb decurrent false aster populations present on the east side of the River. Any future development that may occur along the east bank of the Mississippi River would be preceded by a site survey to identify the exact location of the species and any available habitat to be protected. Thus, there would be no impact on this threatened species and no

impairment of Memorial resources within the study area.

SOUNDSCAPE

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

There would be minor short-term adverse impacts on the soundscape of the Memorial from the construction of the pedestrian enhancements, streetscape/riverscape improvements, and pedestrian plaza on Memorial Drive, the pedestrian plazas over I-70, accessible ramps to the riverfront, renovations to the parking garage, the multimodal transit center, and the education and research facility. Noise from these activities would be greatest in the immediate vicinity of the construction activity, and would diminish as visitors migrate from the activity. Given the existing background noise levels throughout much of the Memorial, noise from construction would only be periodically discernable above background noise levels, and would generally not interfere with a user's enjoyment of the Memorial grounds.

There would be continuing minor long-term adverse impacts on the soundscape of the Memorial from the existing maintenance-related activities, including lawn mowing and testing of the emergency generators. In addition, moving the grounds maintenance facility off the Memorial grounds would result in minor long-term impacts on the soundscape as maintenance vehicles would be operated in off-site areas. Implementation of a visitor transportation system would introduce a new noise source to the Memorial grounds and the surrounding streets. The long-term impacts on the soundscape of the Memorial associated with the visitor transportation system are expected to be minor.

Increased visitation to the Memorial grounds and the East St. Louis addition would result in a minor long-term adverse impact on the soundscape of these areas. Increased special events programming would result in large numbers of people driving to and congregating on the Memorial grounds. The crowd noise and amplified music or public address systems would constitute a minor to moderate short-

term adverse impact on the soundscape of the Memorial.

Removal of parking from the Old Cathedral and north parking garage would have a minor beneficial impact on the soundscape of the Memorial, but would result in increased noise in other areas of St. Louis, as visitors would need to travel further to look for parking. The removal of vehicular traffic from Memorial Drive and the creation of a pedestrian plaza would also result in a beneficial impact on the soundscape of the Memorial grounds, but would transfer this traffic noise to downtown streets.

ANALYSIS OF CUMULATIVE IMPACTS

There would be minor short-term and long-term adverse impacts and minor to moderate long-term beneficial impacts on the soundscape of the Memorial as a result of the implementation of the Park into the City alternative. These impacts, when considered together with the impact of ongoing or planned projects in the vicinity of the Memorial, may contribute to a minor long-term beneficial cumulative impact on the soundscape of the Memorial. This beneficial cumulative impact would result primarily from the removal of traffic from Memorial Drive and the creation of the pedestrian plaza.

CONCLUSION AND IMPAIRMENT FINDING

The Park into the City alternative would have minor short-term adverse impacts on the soundscape of the Memorial from the construction of the pedestrian enhancements, streetscape improvements, riverfront improvements, and pedestrian plaza on Memorial Drive, and accessible ramps to the riverfront, education and research facility, and multimodal transit center. There would also be continuing minor long-term adverse impacts on the soundscape from the existing maintenance activities. Moving the grounds maintenance facility off the Memorial grounds and implementing a visitor transportation system would result in minor long-term adverse impacts on the soundscape. Increased special events programming would result in minor to moderate short-term adverse impacts on the soundscape of the Memorial.

The removal of traffic from Memorial Drive and the creation of the pedestrian plaza would have a minor to moderate beneficial impact on the soundscape of the Memorial grounds, likely improving visitor experience. However, the rerouting of traffic through downtown St. Louis would result in minor to moderate local increases in traffic noise on downtown streets. Overall, there would be no impairment of the soundscape of the Memorial, and there may be an improvement of the current soundscape of the Memorial if all elements of this alternative are implemented.

Visitor Opportunities and Use

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

The focus of the Park into the City alternative is to extend the visitor's experience of the Memorial into downtown St. Louis and the surrounding neighborhoods, including East St. Louis. Changes implemented under this alternative are expected to have moderate beneficial long-term impacts on visitor opportunities. Visitor opportunities are expected to improve with the redesign of exhibits, including more interactive experiences at the Museum of Westward Expansion and the Old Courthouse. Visitor experiences are expected to improve with the development of barrier-free access to the riverfront and the museum. Visitors would have more opportunities for heritage education and orientation with new facilities developed at the north end of the Memorial and the North and South Overlooks. In addition, the north and south ends of the Memorial have been zoned to include more amenities and heritage education, improving visitor experience. Visitors would continue to have access to recreational activities on the surface of the Memorial grounds. Short-term adverse impacts may also occur during peak periods due to crowding at popular sites.

Implementation of the Park into the City alternative may have short- and long-term moderate beneficial impacts on visitor use. The rehabilitation of exhibits and the introduction of more interactive experiences may encourage more repeat visitors to the site, increase the number of first-time visitors, and/or encourage visitors to extend their stay while at the Memorial. In addition, more amenities

and opportunities for heritage education may have a long-term beneficial impact on visitor use, and may encourage visitors to extend their stay while at the Memorial. The development of barrier-free and ADA/ABAAS-compliant access to the Memorial may attract additional visitors to the site. Visitation is also expected to increase with the addition of more special events.

ANALYSIS OF CUMULATIVE IMPACTS

The rerouting of Memorial Drive may have beneficial impacts on residents, visitors, and employees working in downtown St. Louis. These improvements would include a series of plazas that would improve the connectivity of the Memorial with Luther Ely Square and the Old Courthouse. In addition, the improvements would further fulfill the goals of the Gateway Mall, connecting the existing Mall with the Memorial and unifying the entire corridor. This would likely improve the desirability of downtown St. Louis as a place to live, work, and visit. A new transportation system that would link visitors with attractions both inside and outside the Memorial may generate beneficial cumulative impacts by improving the visitor's experience, further supporting other businesses in downtown St. Louis, and more effectively linking the Memorial with the overall urban setting. Overall, this creates a beneficial cumulative impact on visitor use and experience of downtown St. Louis.

CONCLUSION

Implementation of the Park into the City alternative would have moderate long-term beneficial impact on visitor opportunity and use. Visitor opportunities are expected to improve with the redesign of exhibits at the Museum of Westward Expansion and the Old Courthouse. Visitor experiences are expected to improve with the development of barrier-free access to the riverfront and the museum. Improvements in streetscapes and the introduction of a new transportation system are expected to increase connectivity to local neighborhoods in downtown St. Louis, and to have a long-term beneficial impact on visitor opportunities and use.

Transportation and Access

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Under the Park into the City alternative, the elimination/realignment of Memorial Drive would result in a potential long-term minor adverse impact on traffic and congestion on city streets near the Memorial. This action would add traffic to adjacent downtown streets, in particular Fourth Street and Broadway Street. The removal of parking from the parking garage would result in a moderate beneficial impact on traffic patterns and vehicle movement along Washington Avenue, but could increase traffic and congestion on streets in downtown St. Louis and Laclede's Landing. The removal of the NPS maintenance facility outside of the Memorial boundary would result in a minor adverse impact on traffic on adjacent city streets, due to maintenance equipment operating on those streets.

Public transportation would experience a moderate to major beneficial long-term impact under this alternative. The elimination of parking at the Arch Parking Garage would allow for a better connection to the existing Metro station in the Eads Bridge. The new facility would include a multimodal transit center, which would serve as a base of operations for a new visitor transportation system. This rubber-tired trolley or bus system would link attractions within and outside the Memorial, including key stops within downtown St. Louis. This transportation system is anticipated to operate in 15- to 20-minute headways in partnership with downtown business organizations and/or Metro.

The closing of Memorial Drive to vehicular traffic would result in major beneficial impacts on pedestrian circulation within the vicinity of the Memorial. The space currently used for vehicles on Memorial Drive would become a large community plaza, softening the edge of the Memorial grounds and creating a connection between Luther Ely Smith Square and the Gateway Arch. In addition, there would be a minor to moderate positive impact on pedestrian circulation due to enhanced connections to Laclede's Landing and Chouteau's Landing and to downtown at the Northwest Plaza.

The elimination of parking on the Memorial grounds would have a major adverse impact on the parking resources of the Memorial, as well potential ramifications on the agreement between the National Park Service and Metro. There would be long-term moderate adverse impacts due to the elimination of the Old Cathedral parking lot, including the loss of 23 employee parking spots. Improving bus drop-off at the Old Cathedral would have a minor beneficial impact. The proposed visitor transportation system would alleviate some of the issues caused by moving parking offsite.

ANALYSIS OF CUMULATIVE IMPACTS

The cumulative impacts of the Park into the City alternative on the transportation resources of the Memorial would be moderate to major beneficial. The transformation of Memorial Drive into a pedestrian plaza fits well with other investments in downtown St. Louis to improve the pedestrian atmosphere, including increased residential development and the implementation of the Gateway Mall Master Plan. In addition, the visitor transportation system would improve visitor connections within the Memorial and surrounding areas.

CONCLUSION

The Park into the City alternative would result in moderate to major long-term beneficial impacts on transportation on and around the Memorial. This determination is due to the significant improvements to pedestrian circulation and transit enhancements, particularly the implementation of a visitor transportation system. This finding assumes that the loss of on-site parking is considered a benefit to the overall visitor experience of the Memorial, rather than a hindrance.

Socioeconomics

SOCIOECONOMICS

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Implementing the Park into the City alternative would increase expenditures on operations and staffing over those estimated under the no action alternative. Annual expenditures are expected to increase by \$6.5 million to over \$26.2 million total when all programs are

implemented, while staffing is estimated to increase by an additional 68 FTE as compared to those under the no action alternative. Increases in expenditures and staffing would have minor beneficial long-term economic impacts on the region, as more federal expenditures are made in the local area, and future employees spend their incomes near their places of employment and residence, generating additional economic activity.

Under the Park into the City alternative, it is expected that visitation to the Memorial would increase over those of the no action alternative. Minor to moderate increases in visitation to the Memorial are expected due to an expansion of special events, which would have a minor beneficial economic impact over the long term. Negligible beneficial economic impacts would occur from an increase in visitation to the education/research center at the Memorial. Minor, positive economic impacts are expected from food service vendors on the plazas along Memorial Drive. Enhanced connectivity to local neighborhoods and Memorial Drive may increase average visit time and patronage of local businesses, resulting in a minor long-term beneficial economic impact. A new visitor transportation system would have a minor to moderate beneficial economic impact on downtown St. Louis, depending on the route. If the route reaches to other major attractions and locations in the city, visitors would likely extend their stays and increase patronage of local businesses throughout downtown.

ANALYSIS OF CUMULATIVE IMPACTS

The implementation of the Park into the City alternative would have a minor to moderate beneficial economic impacts. When this impact is considered together with other ongoing and planned projects in the study area, this could result in a minor long-term beneficial cumulative impact to socioeconomic resources, with impacts limited to businesses in the downtown area.

CONCLUSION

Management of the Memorial would focus on extending the visitor's experience at the Memorial and into downtown St. Louis. The Memorial would continue to be a major

attraction for visitors coming to the St. Louis area, and its appeal to local residents and visitors is expected to generate a minor positive increase in visitation. Visitation to the Memorial would have a long-term minor to moderate beneficial economic impact due to visitor spending and expenditures associated with operations at the Memorial. Impacts would be largely focused within a small geographic area near the Memorial, but may be expanded if a visitor transportation system travels near other important downtown sites and businesses. Cumulative impacts from other projects and planning activities have the potential to increase visitation to the Memorial and downtown, which would have a minor beneficial impact on downtown retailers and businesses.

LAND USE

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

Implementation of the Park into the City alternative, with its emphasis on extending the Memorial into downtown St. Louis and surrounding neighborhoods may have beneficial impacts on land use. Changes in routing of Memorial Drive would have a long-term beneficial impact on land use in and around the Memorial by improving the connectivity of the Memorial with other parts of downtown, and extending the urban park experience of the Memorial into the city. Eliminating on-site parking would improve the utilization of parking facilities in downtown, while allowing existing parking areas to be redeveloped and used for more heritage education and visitor amenities consistent with the Memorial's purpose and goals.

Expansion of the Memorial's boundary to include 100 additional acres in East St. Louis would have moderate beneficial impacts on land use. As a result of this expansion, the National Park Service would be able to influence development of areas along the east bank of the Mississippi River that are compatible with the existing Memorial grounds.

ANALYSIS OF CUMULATIVE IMPACTS

Implementation of the Park into the City alternative may have beneficial, long-term

impacts on land use within and outside the Memorial, when considered together with recently completed, ongoing, and planned projects within the study area. The rerouting of Memorial Drive may generate long-term moderate beneficial impacts on land use in and around the Memorial. By eliminating traffic along Memorial Drive adjacent to one of the major entrances to the Memorial, the site would become much more connected to other parts of downtown including Luther Ely Smith Square, the Old Courthouse, and the Gateway Mall. This action would enable the City's goal of connecting the Gateway Mall with the Memorial, and enhancing the entire corridor as an important amenity for residents and visitors alike. Moving significant facilities off the Memorial Grounds, such as the maintenance facilities and parking garage, may have positive beneficial impacts on land use depending on where the facility is located. For instance, locating the maintenance facility within Chouteau's Landing may encourage redevelopment of the area, a major goal of the City's development community. NPS actions in East St. Louis would not only enhance the land uses planned by Metro Parks, but may also encourage other partnerships that can further develop the area with compatible uses, linking the east and west sides of the river.

CONCLUSION

Implementation of alternative 5 is expected to have a long-term moderate beneficial impact on local land use. The rerouting of Memorial Drive has the potential to generate long-term moderate beneficial impacts on land uses in and around the Memorial. Eliminating on-site parking would allow the Memorial to expand opportunities for heritage education and visitor amenities. This action may also cause parking facilities downtown to be utilized more efficiently. Moderate beneficial impacts would also occur with the expansion of the Memorial's boundary into East St. Louis, which would encourage compatible development with Metro Parks and other potential partners.

NPS Operations

ANALYSIS OF DIRECT AND INDIRECT IMPACTS

The changes proposed in this management alternative would have moderate to major adverse impacts on the operational resources of the Memorial. According to analysis provided by current staff at the Memorial, the changes to the operation of the Memorial related to this alternative would require an increase of 68 additional FTE. The construction of new heritage and educational facilities at the north and south ends of the Memorial, as well as the new plaza in place of Memorial Drive, would require additional maintenance, law enforcement, and curatorial staff. Therefore, the direct impact would be moderate to major adverse over the long-term.

ANALYSIS OF CUMULATIVE IMPACTS

Given the current underfunding of operations at the Memorial, the proposed expansion of facilities and programs at the Memorial would have moderate to major adverse impacts. These impacts, when considered with other ongoing and planned projects, could contribute to a cumulative impact to operations, since the projects outside of the Memorial grounds could increase the number of people living in or visiting the downtown, and thus the number of people visiting the Memorial.

CONCLUSION

The long-term impacts of the Park into the City alternative would be moderate and adverse. The expanded facilities would require a commensurate increase in NPS operational resources.

Unavoidable Adverse Impacts

Depending on the level of ground disturbance, the Park into the City alternative could have unavoidable impacts on subsurface archeological resources. Adverse impacts on vegetation would result from the continued use of the Memorial by visitors. In addition, the maintenance of the Memorial over time would

have minor long-term adverse impacts on the soundscape of the Memorial. These impacts are considered unavoidable.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are actions that result in the permanent loss of resources. Irretrievable commitments of resources are actions that result in the loss of resources for a period of time. Construction of the various elements of the Park into the City alternative would result in an irreversible and irretrievable commitment of resources used in the construction of the facilities. However, since these facilities would be put to beneficial use, these commitments of resources are not considered to be a significant impact of this alternative.

Relationship of Short-Term Uses and Long-Term Productivity

Jefferson National Expansion Memorial would continue to be used by the public as a cultural and recreational resource, and the National Park Service would manage the Memorial to preserve its cultural and natural resources. Actions taken under this alternative would be consistent with the NPS mission and would provide for the long-term protection of the cultural and natural resource values for which the Memorial was established.