



# Jefferson National Expansion Memorial

Environmental Assessment for Implementing  
CityArchRiver Initiative Elements





# Executive Summary

## PURPOSE OF AND NEED FOR ACTION

The purpose of the proposed action analyzed in this Environmental Assessment (EA) is to fulfill the goal of revitalizing Jefferson National Expansion Memorial, as called for by the selected action in the November 2009 Record of Decision (ROD) for the park's General Management Plan (GMP)/Environmental Impact Statement. While the GMP provided direction on the type of projects that could be implemented, the 2009 selected action called for the National Park Service (NPS), in close coordination with its partners, to initiate a design competition that would provide a wide breadth of ideas on how to meet this goal, and, ultimately, form the basis for the design of more specific projects.

The design competition began in December 2009 and the winning team and design were selected in September 2010. The NPS now needs to evaluate projects proposed by the winning team and park partners that have the potential to cause physical changes to the park grounds. Action is needed now so that projects may be finished in time for the 50th anniversary of completion of the Gateway Arch (October 28, 2015).

## OBJECTIVES IN TAKING ACTION

The National Park Service considers objectives to be those goals that must be achieved to a large degree for the action to be considered a success (NPS 2001). All alternatives selected for detailed analysis must meet project objectives and resolve the purpose of and need for action. Many of the objectives developed by NPS for this action incorporate or reflect the goals

of the design competition relevant to those project components. Additionally, goals for the Central Riverfront have been identified by Great Rivers Greenway District, and are also integrated in the objectives listed below.

### GENERAL

- Ensure that revitalization of the park reflects the iconic status of the Gateway Arch and embraces the Mississippi River, but does not violate requirements in the NPS Organic Act or NPS Management Policies 2006.
- Working with partners, catalyze increased vitality in the St. Louis region and create attractors to promote extended visitation to the Arch, the city, and the river.

### CULTURAL RESOURCES

- Ensure that the revitalization of the park and improvements to the Central Riverfront preserve the integrity and honor the character-defining elements of the National Historic Landmark and relevant National Register Historic Districts.
- Avoid unacceptable impacts on the cultural landscapes, historic resources, and archeological resources as a result of revitalizing the park and improving the Central Riverfront.

### VISITOR USE AND EXPERIENCE

- Ensure that revitalization of the park and the Central Riverfront improves connections amongst the city, the park, and the river.

- Enhance the experience at the park and along the Central Riverfront and reduce the adverse impacts from adjacent transportation systems.
- Ensure that visitor safety and accessibility for people with disabilities is improved and that the experience at the park and along the Central Riverfront is enhanced by creating a welcoming and accessible environment.

### **INTERPRETATION/EDUCATION**

- Improve visitor understanding of the purpose of the park, including the story of St. Louis as the gateway to American westward expansion.
- Along the Central Riverfront, provide opportunities for education connected to the Mississippi River and the historic levee.

### **PARK MANAGEMENT AND OPERATIONS**

- Incorporate sustainable methods into park management and operations while minimizing impacts of revitalization on financial resources, staffing requirements, and long-term maintenance requirements; improve Central Riverfront operations by reducing flood-related closures and cleanup activities.

## **ALTERNATIVES CONSIDERED**

The alternatives under consideration include a required “no action” alternative and two action alternatives that were developed by an interdisciplinary planning team and through feedback from the public and the design team during the planning process. The alternatives are described below. There are a number of elements that would be common to all alternatives as well as common to just the action alternatives, which are described in detail in the “Alternatives” chapter of this EA.

### **NO- ACTION ALTERNATIVE**

The no-action alternative primarily reflects current conditions and activities at the park and the Central Riverfront. Under the no-action alternative,

the National Park Service would landscape the surface of the Park Over the Highway structure across I-70 after its construction by the Missouri Department of Transportation (MoDOT). The other areas of the park and the Central Riverfront would continue to function much the way they do today. The no-action alternative “sets a baseline of existing impacts continued into the future against which to compare impacts of action alternatives” (NPS 2001). Long-term deferred maintenance projects could occur at the park over time as funding becomes available.

### **ACTION ALTERNATIVES**

The action alternatives (alternatives 2 and 3) would: alter visitor accessibility both to and within the park and the Central Riverfront; create new and enhance existing programming opportunities; and improve plantings by implementing key unrealized parts of Dan Kiley’s 1964 Final Conceptual Planting Plan (Office of Dan Kiley 1964). Changes to the existing landscape would maintain the integrity of the original design intent as defined in the 2010 Cultural Landscape Report (NPS 2010), and the park’s designation as a National Historic Landmark (NHL).

### **ALTERNATIVE 2: MODERATE CHANGE**

Under alternative 2, Luther Ely Smith Square would be re-graded to provide a large plaza at its western edge that slopes gently downward to the confluence of the extensions of the Processional Walks across the Park Over the Highway over I-70. Moving east, visitors would enter the lawn at its western edge, approaching a small rise before coming to a shallow valley that descends to the base of the Arch. The paths on either side of the lawn would be lower than the lawn with planted slopes of canopy trees on the exterior edges of the pathways that shield pedestrians from the noise and pollution of I-70. These paths would transition to meet with existing Processional Walks, creating an accessible link to the Arch across the Park Over the Highway. Plantings lining the paths from Luther Ely Smith Square and crossing over the Park Over the Highway would be comprised of shrubs that would not grow high enough to interfere with the Saarinen vista.

The Arch Parking Garage would remain under alternative 2 and the majority of new plantings in the North Gateway would be limited to the

northwest intersection, planting at or on the structure of the garage as feasible, and planting of the streetscape adjacent to the garage. An accessible route from the North Gateway to the existing Arch Parking Garage elevators would be provided for visitors with disabilities to access the park.

Changes to the highway and street infrastructure introduced by MoDOT would alter access to the garage. These changes would close Washington Avenue between 1st Street and Memorial Drive (at the northwest intersection). Access to the Arch Parking Garage would be provided through Laclede's Landing, Leonor K. Sullivan Boulevard, and via a "slip-lane" at the proposed northbound exit off the interstate highway at Memorial Drive.

Alternative 2 would renovate existing exhibit space at the Visitor Center/Museum. Accessible interior and exterior entrance and egress ramps would be added to supplement the existing ramps at the Arch legs entrances. Galleries and exhibits would also be renovated in the Old Courthouse and accessibility to and within the Old Courthouse would be improved with ramps on the exterior of the building and elevators on the interior of the building.

Two to four universally accessible paths would be integrated into the East Slopes from the park to the Central Riverfront. Plantings along the East Slopes would provide areas for sitting and gathering space. Universally accessible paths to and around the north and south reflecting ponds would be installed. Subtle grading and plantings would create swales to catch and detain stormwater runoff. The Processional Walks would be replaced to repair the subsurface and surface conditions. The adjacent ash trees would also be replaced with a more suitable species to protect against the loss of trees due to the emerald ash borer.

The elevation of Leonor K. Sullivan Boulevard would be raised to reduce the frequency of flood events and a multi-modal roadway would be established.

### **ALTERNATIVE 3: MAXIMUM CHANGE**

Alternative 3 proposes that the West Gateway serve as a major point of arrival for visitors to the park across the Park Over the Highway landscape over I-70. It would provide outdoor

spaces for group orientation and gathering, and spaces for individual rest and relaxation in an expanded Luther Ely Smith Square. The West Gateway would act as both a conceptual and literal bridge between the park grounds, the Old Courthouse, and downtown St. Louis. A plaza and ground-level West Entrance to the Visitor Center/Museum complex beneath the Gateway Arch would be installed. Plantings directly in front of the West Entrance to the Visitor Center/Museum across the Park Over the Highway would be comprised of shrubs and small trees that would not grow higher than the berm or interfere with the Saarinen vista.

The Arch Parking Garage would be demolished under alternative 3, and replaced with a new landscape in the North Gateway that would take advantage of local adjacencies to the Laclede's Landing neighborhood to the north and the Washington Avenue/ Convention Center corridor to the west. A parking strategy would be implemented to facilitate access to nearby parking for visitors, park staff, and others accessing the park and adjacent downtown activities. Demolition of the Arch Parking Garage would occur only after implementation of an alternative parking strategy.

The North Gateway slopes and valley between the park and the Eads Bridge would be a vegetated and mown area with scattered trees, which would preserve views into the park. A large lawn would use high-use turf intended to withstand heavy use. An "Explorers" garden would feature woodland plantings that would serve as educational tools, such as illustrating the botanical aspects of Lewis and Clark's journey.

Alternative 3 would create multiple accessible pedestrian passages between the park, the Washington Avenue corridor, Laclede's Landing, and the Mississippi riverfront. All four existing connections underneath the Eads Bridge between Laclede's Landing and the park would be made compliant for pedestrian accessibility, creating full access between the two downtown attractions. Washington Avenue between Memorial Drive and Leonor K. Sullivan Boulevard would be closed to through traffic, a drop-off area would be

established, and a shared pedestrian/bicycle path would be installed that would provide a pedestrian accessible route from the city to the Central Riverfront. Smaller paths off this route would make connections between Laclede's Landing and the rest of the park. An elevated walk installed in the North Gateway would make a connection over the bike path to create an accessible route from North 1st Street to the park. The intersection of Washington Avenue and Memorial Drive would become a four-way intersection with the closure of Washington Avenue to through traffic between Memorial Drive and Leonor K. Sullivan Boulevard. The new West Entrance would provide an accessible entrance and exit for visitors.

The existing spaces in the Visitor Center/ Museum beneath the Gateway Arch would be selectively renovated and an additional 35,000-50,000 square feet of space constructed, depending on design development. Accessible egress ramps would be added to supplement the existing ramps at the Arch legs entrances. Galleries and exhibits would also be renovated in the Old Courthouse and accessibility to and within the Old Courthouse would be improved with ramps on the exterior of the building and elevators on the interior of the building.

Two to four universally accessible paths would be integrated into the East Slopes from the park to the Central Riverfront. The East Slopes would be planted with areas for sitting and gathering space. Universally accessible paths to and around the north and south reflecting ponds would be installed. Subtle grading and plantings would create swales to catch and detain stormwater runoff. The Processional Walks would be replaced to repair the subsurface and surface conditions. The adjacent ash trees would also be replaced with a more suitable species to protect against the loss of trees due to the emerald ash borer.

The elevation of Leonor K. Sullivan Boulevard would be raised to reduce the frequency of

flood events and a multi-modal roadway would be established.

## **ENVIRONMENTAL CONSEQUENCES**

The summary of environmental consequences considers the alternatives being proposed and the cumulative impacts to resources from occurrences inside and outside the park unit. The potential environmental consequences of the alternatives are addressed for: cultural resources; vegetation; soundscape; floodplains; water resources; visitor use and experience; socioeconomics; and management and operations. The table on the following pages summarizes the results of the impacts analysis for these topics.

Impact Topic	Alternative 1: No-Action Alternative	Alternative 2: Moderate Change	Alternative 3: Maximum Change
Historic Buildings, Structures, Sites, Objects, and Districts	<p>Parkwide and locally, construction-related impacts under the no-action alternative would result in short-term minor adverse impacts to character-defining features of the NHL District such as vegetation and topography. The addition of the Park Over the Highway landscaping would also have long-term minor adverse impacts to these features, but would also have long-term beneficial impacts for example on the setting of the NHL District.</p>	<p>Parkwide and locally, construction would result in short-term moderate adverse impacts to the NHL District due to, for example, addition of ramps at the Visitor Center/Museum, paths around the ponds and along the East Slopes, and the addition of the Park Over the Highway landscaping. Modifications for accessibility would occur at the Old Courthouse.</p> <p>This alternative would involve some alteration of historic buildings, structures, sites, objects, and districts through the addition of accessibility and security measures that alter the visual character of the resources and their settings and parkwide and local long-term moderate adverse impacts would occur. Negligible to minor short-term and long-term impacts on resources within the cultural resources impact area would occur along the riverfront, affecting the NHL District and Eads Bridge. Beneficial impacts would result from changes such as the replacement of the ash trees and repair of the Processional Walks.</p>	<p>Parkwide and locally, construction would result in short-term moderate adverse impacts to the NHL District due to, for example, the addition of the new West Entrance, ramps at the Visitor Center/Museum, paths around the ponds and along the East Slopes, and changes to the park landscape along the Central Riverfront. Modifications for accessibility would occur at the Old Courthouse.</p> <p>This alternative would involve some alteration of historic buildings, structures, sites, objects, and districts through changes addition of accessibility and security measures that alter the visual character of the resources and their settings and parkwide and local long-term moderate adverse impacts would occur. Negligible to minor short-term and long-term impacts on resources within the cultural resources impact area would occur along the riverfront, affecting the NHL District and Eads Bridge. Beneficial impacts would result from changes such as the replacement of the ash trees, repair of the Processional Walks and removal of the Arch Parking Garage.</p>
Cultural Landscapes	<p>Parkwide, the no-action alternative would have short-term minor adverse impacts due to construction activities that would disrupt the cultural landscape. The Park Over the Highway landscape alterations and retention of portions of the park landscape with non-historic appearances would have long-term minor adverse impacts; however, the Park Over the Highway would also have long-term beneficial impacts by enhancing the primary axial connection between the Old Courthouse, the park, and the river.</p>	<p>Parkwide, alternative 2 would have short-term moderate adverse impacts due to construction activities that would disrupt the cultural landscape. Long-term minor adverse parkwide and local impacts would occur due to the Park Over the Highway landscape alterations, the addition of paths at the ponds and the East Slopes, ramps at the Visitor Center/Museum, and changes to the North and South Overlooks and the Grand Staircase. Long-term beneficial impacts would occur due to changes that are in keeping with the Saarinen/Kiley design intent, such as the addition of the landscaped Park Over the Highway and the replacement of ash trees and repair of the Processional Walks.</p>	<p>Parkwide, alternative 3 would have short-term moderate adverse impacts due to construction activities that would disrupt the cultural landscape. Long-term moderate adverse parkwide and local impacts would occur due to changes required to construct the new West Entrance, paths around the ponds and at the East Slopes, ramps at the Visitor Center/Museum, and changes to the North and South Overlooks and the Grand Staircase. Long-term beneficial impacts would occur due to changes that are in keeping with the Saarinen/Kiley design intent, such as the addition of the landscaped Park Over the Highway and the replacement of ash trees and repair of the Processional Walks. Removal of the non-historic parking garage would and the reduction of flooding along the Central Riverfront would also contribute to beneficial impacts.</p>

Impact Topic	Alternative 1: No-Action Alternative	Alternative 2: Moderate Change	Alternative 3: Maximum Change
Archeological Resources	Ground-disturbing activities related to maintenance activities and the installation of the Park Over the Highway landscape in the no-action alternative could disturb as-yet unidentified archeological resources; however, mitigation measures would be implemented to minimize impacts and alternative 1 would result in minor adverse impacts to archeological resources.	Parkwide and along the Central Riverfront, ground disturbances related to the project elements including the Park Over the Highway could disrupt or displace as-yet identified archeological resources; however, mitigation measures would be implemented and alternative 2 would result in moderate adverse impacts to archeological sites.	Parkwide and along the Central Riverfront, ground disturbances related to the project elements including the Park Over the Highway, the new West Entrance, and the Visitor Center/Museum addition could disrupt or displace as-yet identified archeological resources; however, mitigation measures would be implemented and alternative 3 would result in moderate adverse impacts to archeological sites.
Museum Collections	Existing collections storage and exhibit spaces, access, and climate control conditions would remain and alternative 1 would result in minor short-term adverse and long-term negligible to minor adverse impacts to museum collections.	The temporary disruption in access to museum collections during construction under alternative 2 would result in short-term minor adverse impacts. The improvements to collections storage, exhibit, and interpretation spaces would have long-term beneficial impacts to museum collections.	The temporary disruption in access to museum collections during construction under alternative 3 would result in short-term minor adverse impacts. The expansion of and improvements to collections storage, exhibit, and interpretation spaces would have long-term beneficial impacts to museum collections.
Vegetation	The no-action alternative would result in minor short-term adverse impacts due to temporary disturbances during implementation of the planted landscape across the Park Over the Highway. There would be negligible long-term impacts to vegetation as regular maintenance and existing conditions would continue.	Alternative 2 would result in moderate short-term adverse impacts due to temporary disturbances of a relatively large amount of vegetation during construction. Minor long-term adverse impacts to vegetation would occur due to the permanent removal of a limited amount of vegetation. Long-term beneficial impacts would also occur due to an increase in vegetation health and diversity.	Alternative 3 would result in moderate short-term adverse impacts due to temporary disturbances of a relatively large amount of vegetation during construction. Long-term beneficial impacts would occur from a substantial increase in the amount of vegetation as well as an increase in vegetation health and diversity.
Soundscape	The no-action alternative would result in minor short-term adverse impacts to soundscapes from noise generated by the installation of the Park Over the Highway landscape. The continuation occasional operational noises above background conditions would cause minor long-term adverse impacts to soundscapes.	Alternative 2 would result in moderate short-term adverse impacts to soundscapes due to intermittent noise above background conditions generated by construction activities to implement project elements. The continuation of occasional operational noises above background conditions would cause minor long-term adverse impacts to soundscapes. The potential for sound attenuation from landscape additions to the park would create long-term beneficial impacts by reducing noise intruding on the park's soundscape.	Alternative 3 would result in moderate short-term adverse impacts due to intermittent noise above background conditions generated by construction activities to implement project elements. The continuation of occasional operational noises above background conditions would cause minor long-term adverse impacts to soundscapes. The potential sound for attenuation from landscape additions to the park and the removal of vehicular traffic noise sources in the North Gateway would create long-term beneficial impacts by reducing noise intruding on the park's soundscape.

Impact Topic	Alternative 1: No-Action Alternative	Alternative 2: Moderate Change	Alternative 3: Maximum Change
Floodplains	There would be no disturbance to floodplains and therefore no short- or long-term impacts to floodplains in alternative 1.	Construction-related activities under alternative 2 would not change floodplain functions or values and no short-term impacts would occur. The changes to the Central Riverfront would not alter the nature of the development in the floodplain or its functions and values and would have negligible long-term impacts to floodplains.	Construction-related activities under alternative 3 would not change floodplain functions or values and no short-term impacts would occur. The changes to the Central Riverfront would not alter the nature of the development in the floodplain or its functions and values and would have negligible long-term impacts to floodplains.
Water Resources	Construction-related impacts under the no-action alternative would result in short-term minor adverse impacts to water resources due to an increased potential for soil erosion and transport of surface pollutants into adjacent water bodies and storm sewers. As the site would continue to operate under current conditions, pollutants in stormwater runoff would enter the Mississippi River during storm events and long-term minor adverse impacts to water resources and water quality would occur.	Alternative 2 would result in minor short-term adverse impacts during construction due to an increased potential for soil erosion and transport of surface pollutants into adjacent water bodies and storm sewers. Minor long-term adverse impacts would occur due to an increase in water use for irrigation in the park and the continued stormwater runoff that contains pollutants entering the Mississippi River during storm events. Beneficial impacts would also occur as new methods used to reduce and treat stormwater and a reduction in the use of pesticides would be implemented.	Alternative 3 would result in moderate short-term adverse impacts to water resources during construction due to an increased potential for soil erosion and transport of surface pollutants into adjacent water bodies and storm sewers. Minor long-term adverse impacts would occur due to an increase in water use for irrigation in the park and the continued stormwater runoff that contains pollutants entering the Mississippi River during storm events. Beneficial impacts would also occur due to new methods used to reduce and treat stormwater, increased vegetation, and a reduction in the use of pesticides.
Visitor Use and Experience	Construction of the Park Over the Highway landscape under the no-action alternative would result in short-term negligible to minor adverse impacts as visitor access to the West Gateway would be limited during construction. Long-term negligible to minor adverse impacts to visitor use and experience would occur as new destinations, activities, and improvements would not be added to the park and flooding events would continue to limit access to the Central Riverfront. The Park Over the Highway landscape would have long-term beneficial impacts to visitor use and experience due to the improved landscaped pedestrian connection between downtown and the park.	Construction-related impacts under alternative 2 would result in short-term moderate adverse impacts to visitor access to activities and destinations within areas of the park that could be limited or changed to accommodate construction. In the long term, there would be beneficial impacts to visitor experience and satisfaction due to the increase in destinations, activities, and accessibility within the park and along the Central Riverfront and the improved landscaped pedestrian connection between downtown and the park. Minor adverse impacts to visitor use and experience would also occur due to a continued shortage of oversize and short-term vehicle parking.	Construction-related impacts under alternative 3 would result in short-term moderate adverse impacts to visitor access to activities and destinations within areas of the park that could be limited or changed to accommodate construction. Long-term minor adverse impacts to visitor use and experience would occur due to the change in the designed visitor's entry approach to the Visitor Center/Museum and a continued shortage of oversize and short-term vehicle parking. In the long term, there would be beneficial impacts to visitor experience and satisfaction due to the increase in opportunities, destinations, activities, and accessibility within the park and along the Central Riverfront and the new West Entry that would provide a direct pedestrian connection between downtown and the park.

Impact Topic	Alternative 1: No-Action Alternative	Alternative 2: Moderate Change	Alternative 3: Maximum Change
Socioeconomics	<p>Construction-related spending impacts from implementation of the Park Over the Highway landscape under the no-action alternative would have a short-term beneficial economic impact on the local economy as spending could generate revenue for individual businesses in the region. Long-term economic impacts in downtown St. Louis and the region would be negligible as no other broad changes in management, visitation, or operations would occur and visitorship levels and visitor spending in the local area would likely follow existing trends. There would be continued minor short- and long-term adverse impacts to socioeconomic resources as the livability benefits provided by the overall park would not be enhanced and periodic flooding along the Central Riverfront would continue. The park and the Central Riverfront would continue to have a short- and long-term local beneficial economic impact on the region driven by visitor spending and operational expenditures.</p>	<p>Construction-related spending impacts under 2 alternative would have a short-term beneficial economic impact on the local economy as spending would generate revenue for individual businesses in the region. Short-term minor adverse local impacts could also occur during construction if visitation declines while access to areas of the park is limited. Actions under alternative 2 would increase visitorship levels as well as visitor and operational spending by increasing and improving visitor facilities and infrastructure throughout the park and the Central Riverfront and connecting the park with the city and the river, which would have long-term beneficial economic impacts in downtown St. Louis and the region and would enhance the overall livability and social benefits the park and the Central Riverfront provide.</p>	<p>Construction-related spending impacts under 3 alternative would have a short-term beneficial economic impact on the local economy as spending would generate revenue for individual businesses in the region. Short-term local minor to moderate adverse impacts could also occur during construction if visitation declines while access to areas of the park is limited. Removal of the Arch Parking Garage would have long-term minor adverse impacts due to the loss of a revenue-generating facility. Actions under alternative 3 would increase visitorship levels as well as visitor and operational spending by increasing and improving visitor facilities and infrastructure throughout the park and the Central Riverfront and connecting the park with the city and the river, which would have long-term beneficial economic impacts in downtown St. Louis and the region and would enhance the overall livability and social benefits the park and the Central Riverfront provide.</p>
Operations and Management	<p>Operations impacts related to construction under the no-action alternative would include short-term minor adverse impacts as maintenance operations access to the Park Over the Highway construction areas would be limited. Flooding events would cause long-term minor to moderate adverse impacts on operations by limiting park maintenance access and require clean-up action by City of St. Louis staff. The lack of energy conservation and sustainable management practices would also contribute to the long-term adverse impacts.</p>	<p>Operations impacts related to construction under alternative 2 would include short-term minor to moderate adverse impacts due to increased use of energy and resources and limited access to areas of the park during construction. An increase in maintenance requirements would have a long-term minor adverse impact on park operations. Improved maintenance conditions, improved sustainability standards, and the potential for an overall reduction in energy and water use at the park would have long-term beneficial impacts</p>	<p>Operations impacts related to construction under alternative 3 would include short-term moderate adverse impacts due to increased use of energy and resources and limited access to areas of the park during construction. An increase in maintenance requirements and the loss of parking revenue would have a long-term minor adverse impact on park operations. Improved maintenance conditions, increased ticketing efficiency and revenue collection, improved energy efficiency and sustainability standards, and the potential for an overall reduction in energy and water use at the park would have long-term beneficial impacts.</p>

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# 1. Purpose and Need for Action

Jefferson National Expansion Memorial  
Environmental Assessment for Implementing CityArchRiver Initiative Elements



## Purpose and Need for Action

### INTRODUCTION

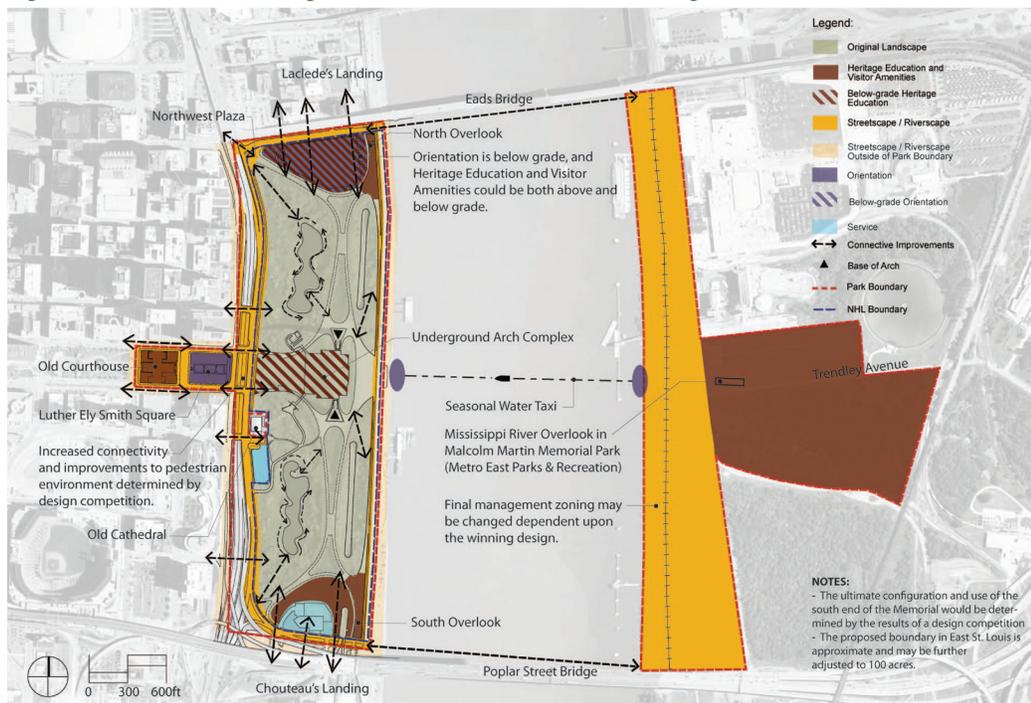
The General Management Plan for Jefferson National Expansion Memorial (NPS 2009) established management zones and called for an international design competition to revitalize Jefferson National Expansion Memorial (the park) by improving connections to downtown St. Louis, Missouri and the riverfront and expanding programming, facilities and partnerships, while enhancing the visitor experience (Figure 1).

The winner of the design competition, Michael Van Valkenburgh Associates (MVVA) of New York, was selected by a jury from a field of five finalists in September 2010 (Figure 2). MVVA

presented updated information about the winning design to the public in January 2011 and January 2012 and has been refining their concept design through a series of discussions with the National Park Service (NPS) and the Great Rivers Greenway District (GRG). This project is part of a broader initiative known as the CityArchRiver 2015 Initiative, and is a unique and important opportunity to integrate the Gateway Arch, the park surrounding it, and the riverfront into the fabric of the city.

The park and the CityArchRiver 2015 Initiative are also identified as part of the America's Great Outdoors (AGO) initiative launched

**Figure 1 2009 General Management Plan Selected Alternative Management Zones**



by President Obama in 2011 to establish a 21st century conservation and recreation agenda and reconnect Americans to the outdoors. The CityArchRiver 2015 Initiative aligns with goals of the AGO by enhancing recreational access and opportunities, providing better access to the park's cultural resources, and creating partnerships with a variety of agencies and organizations.

As part of this effort, pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4332(2) (C)), the NPS has prepared an Environmental Assessment (EA) for an evaluation of alternatives to implement elements of the CityArchRiver 2015 Initiative and revitalize Jefferson National Expansion Memorial. The 2009 General Management Plan provided a broad analysis of potential impacts of the expansion of programs and facilities at the park; this EA provides a more site-specific analysis. The Council on Environmental Quality (CEQ) regulations (40 CFR 1502.20) encourage the use of a tiering process in these types of situations, thereby eliminating repetitive discussions of the same issues.

In addition, Department of the Interior regulations implementing NEPA (43 CFR 46.140) state that an "environmental assessment prepared in support of an individual proposed action can be tiered to a programmatic or other broader-scope environmental impact statement. Tiering to the programmatic or broader-scope environmental impact statement would allow the preparation of an environmental assessment and a finding of no significant impact for the individual proposed action, so long as any previously unanalyzed effects are not significant." This EA follows the tiering guidance in these regulations.

The proposed action involves physical changes to the park grounds and facilities and the Central Riverfront as a method for improving visitor access and experience, while better integrating the park into the downtown St. Louis area. The NPS and the Great Rivers Greenway District are using the EA process to engage the public, to develop a range of reasonable alternatives for implementing the proposed action, and to analyze the impacts of the alternatives.

**Figure 2 Framing a Modern Masterpiece: The City + The Arch + The River 2015 Winning Design**



**THE JEFFERSON NATIONAL EXPANSION MEMORIAL 2009 GENERAL MANAGEMENT PLAN called for an international design competition to revitalize the park by improving connections to downtown St. Louis and the riverfront and expanding programming, facilities and partnerships, while enhancing the visitor experience. The design competition, Framing a Modern Masterpiece: The City + The Arch + The River 2015, explored approaches to facilitate this goal and led to the CityArchRiver 2015 Initiative elements assessed in this EA.**

## PURPOSE + NEED FOR ACTION

The purpose of the proposed action analyzed in this EA is to fulfill the goal of revitalizing Jefferson National Expansion Memorial, as called for by the selected action in the November 2009 Record of Decision (ROD) for the park's General Management Plan/ Environmental Impact Statement (GMP). While the GMP provided direction on the type of projects that could be implemented, the 2009 selected action called for the NPS, in close coordination with its partners, to initiate a design competition that would provide a wide breadth of ideas on how to meet this goal, and, ultimately, form the basis for the design of more specific projects.

The design competition began in December 2009 and the winning team and design were selected in September 2010. The NPS now needs to evaluate projects proposed by the winning team and park partners that have the potential to cause physical changes to the park grounds. Action is needed now so that projects may be finished in time for the 50th anniversary of completion of the Gateway Arch (October 28, 2015).

## OBJECTIVES IN TAKING ACTION

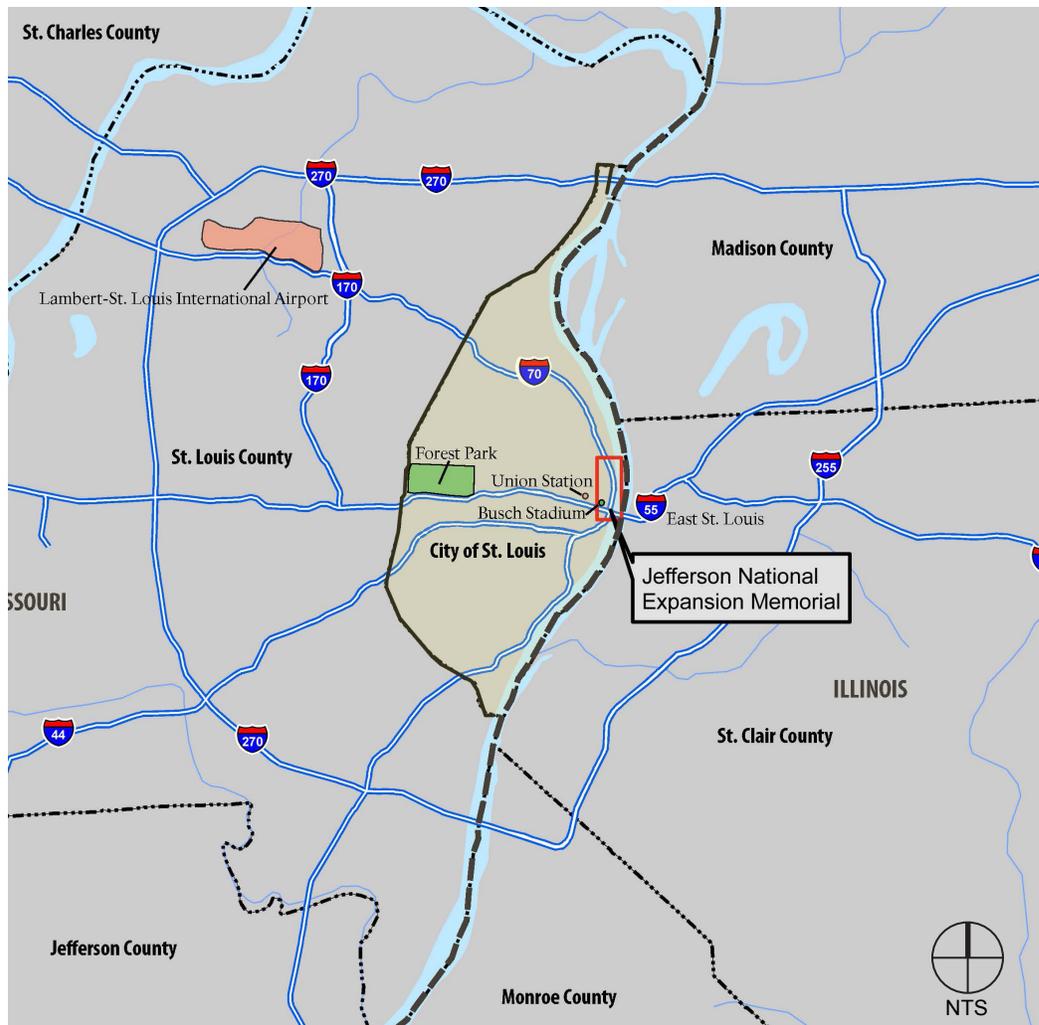
The National Park Service considers objectives to be those goals that must be achieved to a large degree for the action to be considered a success (NPS 2001). All alternatives selected for detailed analysis must meet project objectives and resolve the purpose of and need for action. National Park Service objectives must be grounded in the park's enabling legislation, purpose, significance, and mission goals, and must be compatible with direction and guidance provided by the GMP, strategic plan, and/or other management guidance. Many of the objectives developed by NPS for this action incorporate or reflect the goals of the design competition relevant to those project components being considered in this EA. Additionally, goals for the Central Riverfront have been identified by the Great Rivers Greenway District, and are also integrated in the objectives listed below.

### GENERAL

- Ensure that revitalization of the park reflects the iconic status of the Gateway Arch and embraces the Mississippi River, but does not violate requirements in the NPS Organic Act or NPS Management Policies 2006.
- Working with partners, catalyze increased vitality in the St. Louis region and create attractions to promote extended visitation to the Arch, the city, and the river.

### CULTURAL RESOURCES

- Ensure that the revitalization of the park and improvements to the Central Riverfront preserve the integrity and honor the character-defining elements of the National Historic Landmark and relevant National Register Historic Districts.
- Avoid unacceptable impacts on the cultural landscapes, historic resources, and archeological resources as a result of revitalizing the park and improving the Central Riverfront.



**Figure 3 Jefferson National Expansion Memorial Location**

**VISITOR USE AND EXPERIENCE**

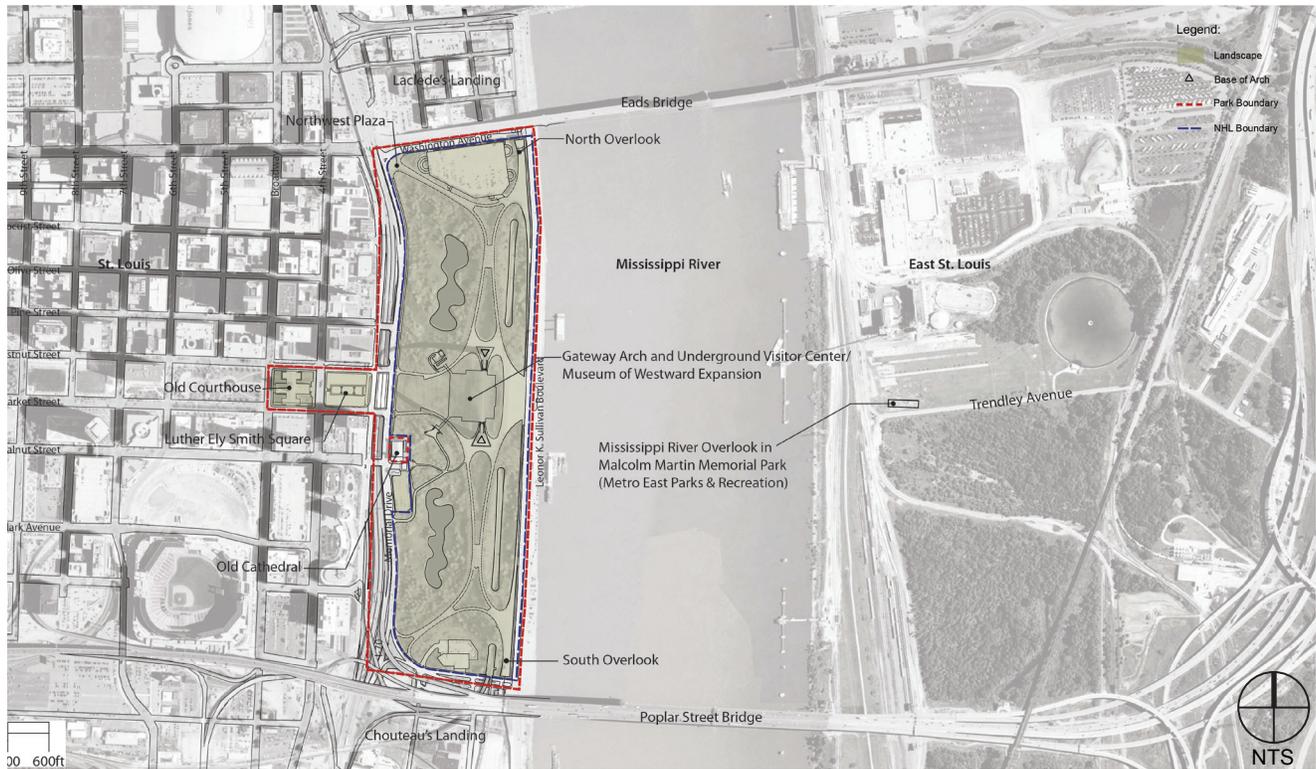
- Ensure that revitalization of the park and the Central Riverfront improves connections amongst the city, the park, and the river.
- Enhance the experience at the park and along the Central Riverfront and reduce the adverse impacts from adjacent transportation systems.
- Ensure visitor safety and accessibility for people with disabilities is improved and that the experience at the park and along the Central Riverfront is enhanced by creating a welcoming and accessible environment.

**INTERPRETATION/EDUCATION**

- Improve visitor understanding of the purpose of the park, including the story of St. Louis as the gateway to American westward expansion.
- Along the Central Riverfront, provide opportunities for education connected to the Mississippi River and the historic levee.

**PARK MANAGEMENT AND OPERATIONS**

- Incorporate sustainable methods into park management and operations while minimizing impacts of revitalization on financial resources, staffing requirements, and long-term maintenance requirements; improve Central Riverfront operations by reducing flood-related closures and cleanup activities.



**Figure 4** Map showing vicinity and urban location of the park

## PROJECT AREA AND SCOPE OF THE NPS ENVIRONMENTAL ASSESSMENT

As described in the GMP, the Jefferson National Expansion Memorial is located entirely within the urban area of downtown St. Louis, Missouri (see Figures 3 and 4). It was the first Secretarial designation under the Historic Sites Act of 1935 (NPS 1994). The 91-acre park sits on the west bank of the Mississippi River and occupies what previously were forty city blocks between Eads Bridge and Poplar Street (NPS 1996a), bounded on the east by Leonor K. Sullivan Boulevard and primarily on the west by Memorial Drive, except for two blocks immediately west of Memorial Drive occupied by Luther Ely Smith Square and the Old Courthouse. The Central Riverfront is located along Leonor K. Sullivan Boulevard between the Mississippi River and the park, to the east and west, and Biddle Street and Chouteau Avenue on the north and south.

The projects being considered on park property and the Central Riverfront are part of the broader CityArchRiver 2015 Initiative. This initiative involves non-NPS projects and NPS projects on a longer-term planning horizon. For example, the Missouri

Department of Transportation (MoDOT) and the Federal Highways Administration (FHWA) are initiating a concurrent EA to assess the effects of proposed changes to I-70 and Memorial Drive, including the construction of a structure built over the depressed section of I-70 as well as changes to the freeway’s ramp system. The surface of the structure would be available to and managed by the NPS to create a continuous landscape connection - a Park Over the Highway. The NPS and MoDOT/FHWA are formal cooperators on each agencies’ NEPA documents, and will continue to work together to ensure the necessary compliance for these project elements are completed.

Other projects outside the park property associated with the CityArchRiver 2015 Initiative include proposed changes to Kiener Plaza. In addition, proposed changes to the East St. Louis side of the Mississippi River are still being considered, and are not ready for a decision at this time. While the projects noted above are not considered as part of the NPS proposed action, they have been addressed in this EA, where appropriate, as part of the cumulative impacts analysis in Chapter 4.

## JEFFERSON NATIONAL EXPANSION MEMORIAL BACKGROUND

### HISTORY OF THE PARK

Jefferson National Expansion Memorial was the brainchild of Luther Ely Smith, a prominent St. Louis attorney. Smith convinced the city mayor, Bernard Dickmann, and prominent St. Louis businessmen that "...a suitable and permanent public memorial to the men who made possible the western territorial expansion of the United States, particularly President Jefferson," should be built on the St. Louis riverfront. On December 21, 1935, President Franklin D. Roosevelt signed Executive Order 7253 providing direction to the Secretary of the Interior for the acquisition and development of Jefferson National Expansion Memorial. Between 1939 and 1942, forty blocks of condemned buildings, remnants of the once-proud riverfront district, were razed. Only the Old Courthouse and the Old Cathedral are still standing today. Just as progress was being made on the park's development, the United States was plunged into World War II, and work on the park was halted.

With the end of the Second World War, Luther Ely Smith resumed the project with an architectural competition. Held in two stages, the competition was judged by a jury of seven nationally recognized architectural and design professionals predisposed toward the Modern style. This predisposition influenced most of the entrants to assume a modern approach to their design submissions. The competition ended in February 1948 and, by secret ballot, the panel of seven unanimously chose design number 144, submitted by Eero Saarinen and the design team that included sculptor and artist Lily Saarinen (Eero's spouse), landscape architect Dan Kiley, illustrator J. Henderson Barr, and designer Alexander Girard. The central feature of the design was a soaring stainless steel arch. Ground breaking for the Gateway Arch occurred on June 23, 1959, and the structure was completed in October of 1965. The GMP provides a more detailed description of the park's administrative history in Chapter 1 (p. 1-3 and 1-4) and in Chapter 3 (p. 3-3 to 3-7). The full administrative history

**The Gateway Arch is an inverted, weighted catenary curve (a type of curve created by supporting both ends of a hanging chain). It soars 630 feet from its base on a constructed landform on the bank of the Mississippi River. The site is recognized as a deliberate built experience, a complete design for a public monument, and a masterpiece composition of integrated structure, landscape, and interpretation.**

of the park is covered in two Administrative History reports, one by Sharon A. Brown documenting the park's administrative history between 1933 and 1980 and one by Bob Moore documenting the park's history from 1980 to 1991. Both of these documents are available on the park's website and are referenced in the bibliography of this EA.

### PURPOSE AND SIGNIFICANCE OF THE PARK

Every unit within the national park system has specific reasons for its establishment as a national park. Purpose statements reaffirm the reasons each unit was designated, help reinforce the foundation for future management and use, and provide a rationale against which all proposed actions can be measured. These statements help visitors, cooperating agencies, partners, members of the community, and other users to understand the framework in which park managers make decisions. The following purpose statements have been refined over time and are based on Jefferson National Expansion Memorial's designation by Executive Order 7253 and subsequent legislative history, as well as laws and policies governing the management of all national park system units. The full text of the executive order establishing the park, its purpose and significance, and other park legislative history can be found in Appendix A of the GMP.

- The park commemorates, through a designed memorial, Thomas Jefferson's vision of building a unified continental nation and St. Louis' role as a confluence

and gateway of the American westward expansion during the 19th century.

- The park interprets the key individuals and cultural groups involved in exploring, exploiting, and inhabiting the western lands from the Mississippi River to the Pacific Ocean.
- The park preserves the architecturally significant Old Courthouse as the site of the Dred Scott case, which divided North and South over the extension of slavery into the western territories and led to the American Civil War.

Significance statements capture the essence of the park’s importance to our country’s natural and cultural heritage and historical events that occurred at this location. Significance statements do not inventory resources, but rather describe the unit’s distinctiveness and place the park within its regional, national, and international contexts. Defining significance helps managers make decisions and focus their efforts and funding on preserving the resources and values necessary to accomplish the park’s purpose.

St. Louis was politically and geographically pivotal in the westward expansion of the United States during the 19th century. Significant historic events associated with westward expansion, exploration, and the fur trade occurred at the site, including the transfer of the Louisiana Territory from Spain to France and then to the United States, the negotiation of numerous treaties removing Indian tribes from their lands, and the provisioning and return of the Lewis and Clark expedition. St. Louis was the starting point for numerous explorers, fur traders, overland pioneers, and others who made the journey west.

In 1846, Dred and Harriet Scott sued for their freedom from slavery at the Old Courthouse in St. Louis. This historic case, argued in 1847, 1850, 1852, and 1854, resulted in an 1857 U.S. Supreme Court decision which determined that all “people of color,” enslaved or free, could not become citizens of the United States, and removed restrictions on the extension

of slavery into the U.S. Western Territories, further dividing the North and South and eventually leading to the Civil War.

The Old Courthouse is a prime example of mid-19th century Greek Revival civic architecture, utilizing the very latest technological innovations and materials available at the time, including the first cast iron dome completed in the United States.

The park is recognized globally as an exceptional example of mid-20th century Modern design. The soaring Gateway Arch is one of the world’s great architectural and engineering achievements. It is a tangible symbol of St. Louis’ historical role as the “Gateway to the West,” purposefully located on the footprint of the original 1764 village of St. Louis. The site is recognized as a deliberate built experience, a complete design for a public monument, and a masterpiece composition of integrated structure, landscape, and interpretation.

The museum objects and archival records in the park’s collection document the westward expansion of the United States and the creation, planning, and building of the park. The collection is used in ongoing research by scholars and staff and is the basis of the historic site’s interpretation programming and museum exhibits.

## FUNDAMENTAL RESOURCES AND VALUES OF THE PARK

Fundamental resources and values are closely related to the park's designated purpose and warrant primary consideration in evaluating plans to revitalize the park, since they are critical to maintaining the park's purpose and significance. If these resources are allowed to deteriorate, the purpose and/or significance of the park could be jeopardized. A loss or major impact to a fundamental resource or value could constitute impairment, violating the 1916 NPS Organic Act. During the GMP process, the planning team, with assistance from resource specialists and public comment, identified the following fundamental resources and values for Jefferson National Expansion Memorial:

- Jefferson National Expansion Memorial Gateway Arch and designed landscape – a National Historic Landmark – integrated by a purposeful approach, scale, and aesthetic quality, including the relationship to the river and to the Old Courthouse and 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 park 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.

## PRIMARY INTERPRETIVE THEMES OF THE PARK

Primary interpretive themes are the most important stories, concepts, and ideas communicated to the public about the park. They are the core of all educational programs and media provided to visitors. From these themes, listed below, visitors can form intellectual and emotional connections with park resources and experiences.

- Thomas Jefferson's vision of the West as a land that would foster and sustain democratic values shaped U.S. policy, including the Louisiana Purchase and the Lewis and Clark Expedition, thus enabling the westward expansion of the 19th century.
- The Gateway Arch symbolizes the westward expansion of the 19th century, an unprecedented and rapid migration of people into the trans-Mississippi West which represented hope, opportunity, and promise for some and religious freedom for others, while also causing cultural clashes, environmental destruction, and the taking of land from American Indians.
- The design and scale of the Gateway Arch integrated with its setting elevates the timeless form of an arch into a structure that is among the world's architectural, artistic, and engineering marvels.
- The Dred Scott Decision was an important event in United States history which spotlighted the potential expansion of slavery into the American West and helped exacerbate regional tensions which led to the American Civil War.
- The architecturally significant Old Courthouse was a crucible of change that galvanized the struggle for civil rights, justice, freedom, and equality, and highlighted the rights and responsibilities of citizenship in St. Louis and the United States.
- The American West is both a symbol and a physical reality that attracts people the world over and continues to shape the national identity.

- St. Louis’ strategic location near the confluence of the Mississippi and Missouri Rivers made it a logical hub of exploration, commerce, military activity, cultural encounter, and transportation as the United States expanded westward during the 19th century.

**Scoping — An early and open process for determining the extent and variety of issues to be addressed and for identifying the significant issues related to a proposed action (40 CFR 1501.7).**

## SCOPING PROCESS AND PUBLIC PARTICIPATION

NEPA regulations require “an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.” The scope of issues to be addressed was discussed at an internal scoping meeting on May 18, 2011, held with the NPS Interdisciplinary Planning Team convened for this plan, as well as many park staff, design team members, CityArchRiver 2015 Foundation representatives, and MoDOT representatives.

NPS published a Notice of Intent to prepare an EA in the Federal Register on July 26, 2011, and in July 2011 the Superintendent announced a 30-day public scoping period to solicit comments on the scope of the project. During this scoping period, the NPS invited the public and all interested parties to comment on all aspects of the project, including concerns or issues related to the project’s impacts. The NPS accepted comments via the NPS Planning, Environment and Public Comment (PEPC) website at [www.parkplanning.nps.gov/jeff](http://www.parkplanning.nps.gov/jeff), by mail, and by hand delivery to the park. The public scoping process is ongoing throughout the planning process. The “Consultation and Coordination” chapter provides additional information on the scoping process.

**National Historic Landmark — A district, site, building, structure, or object of national historical significance, designated by the Secretary of the Interior under authority of the Historic Sites Act of 1935 and entered in the National Register of Historic Places.**

## ISSUES AND IMPACT TOPICS

This EA considers the proposed action and associated effects in light of the key resources that contribute to the physical, cultural, and human environment of Jefferson National Expansion Memorial and the Central Riverfront. To properly assess the relative impacts of the alternatives, specific topics that would be affected are evaluated. Through the internal and public scoping process, the NPS identified the following topics and issues associated with implementation of the alternatives for analysis in this EA.

### CULTURAL RESOURCES

This topic considers the cultural resources that are present on the park site and within the surrounding area. Cultural resources include historic buildings, structures, sites, objects, and districts; cultural landscapes; archeological resources; and museum collections. As these resources exist within the park and along the Central Riverfront, and they could be affected by construction and renovation activities and new infrastructure and facilities, this impact topic was retained for further analysis in this EA. The Gateway Arch and Arch grounds are designated as a National Historic Landmark (NHL). Like all NHLs, the park’s historic resources are vitally important to its existence and purpose.

Agencies that have direct or indirect jurisdiction over historic properties are required by Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, to take into account the effect of any undertaking on properties listed or eligible for listing in the National Register of Historic Places. Consultation under Section 106 of the NHPA is ongoing as a separate but concurrent process with this EA. It is briefly described below; the “Consultation and Coordination”

chapter provides additional information on the Section 106 process.

Section 106 consultation regarding proposed changes at the park occurred during the GMP planning process and for the design competition, *Framing a Modern Masterpiece: The City + The Arch + The River* 2015. In January 2011, the NPS resumed consultation with the Missouri State Historic Preservation Officer, the Advisory Council on Historic Preservation, Tribal Governments, and other consulting parties. As part of the process, the NPS identified historic properties listed in or eligible for listing in the National Register of Historic Places within the broadly defined area of potential effects of the revitalization of the Jefferson National Expansion Memorial. However, due to the relative uncertainty of the nature of all of the potential projects or actions that may stem from the revitalization, the NPS and its consulting parties cannot yet fully assess the potential effects of these projects or actions on historic properties. Therefore, the NPS and its consulting parties entered into a programmatic agreement (PA) in order to establish a process to review site specific design as it becomes available and to assess and resolve adverse effects in accordance with 36 CFR 800.14(b)(1)(ii). The PA is included in Appendix D of this environmental assessment.

Therefore, this EA will document impacts to cultural resources as a result of implementing these projects on park properties and along the Central Riverfront. A separate assessment of effect under Section 106 of the NHPA will be made as appropriate.

### **NATURAL RESOURCES**

The physical and biological resources of the park, the Central Riverfront, and its surrounding environment are an important component of the park. The park's physical setting on the banks of the Mississippi River shapes both the visitor experience and surrounding environmental context. Construction and renovation activities and new infrastructure and facilities could impact certain natural resources, including vegetation, soundscape, and water resources and stormwater management. Alternatives considered in this EA would require

construction within the floodplain of the Mississippi River. Therefore, this impact topic was retained for further analysis.

### **VISITOR USE AND EXPERIENCE**

Visitor use and experience includes visitor opportunities and use such as information, interpretation, and education, as well as recreational activities. It also includes pedestrian and bicycle circulation, parking, and accessibility, or barrier free access. Visitor use and experience would be affected by construction and renovation activities and new infrastructure and facilities; therefore, this impact topic was retained for further analysis.

### **SOCIOECONOMICS**

Because the park is located in downtown St. Louis, regional socioeconomic trends affect the park, and the park contributes to the regional economy. The park attracts millions of visitors each year. Given the importance of the park as a regional attraction, as well as a nationally and internationally recognized icon, social and economic considerations extend beyond the physical boundaries of the park. Construction and renovation activities as well as new infrastructure and facilities have the potential to affect socioeconomic resources and this topic was retained for further analysis.

### **NPS OPERATIONS AND PARTNERSHIPS**

Each of the actions described in the proposed alternatives would affect the operation and management of the park in different ways. Changes in staffing levels, visitor use activities, new facilities, infrastructure improvements, and visitor attractions all have implications for NPS operations. These changes have the potential to affect education and interpretation programs and services, curatorial objects management, grounds and facility maintenance and management, law enforcement and security functions, overall administrative staffing and duties, and energy requirements and conservation/sustainability efforts. Therefore, this impact topic was retained for further analysis.

## ISSUES CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

Some impact topics that are commonly considered in an environmental assessment were not relevant to this assessment, because the proposed action would have no impact or a negligible to minor impact on the resource, or because the resource does not occur within the project area. These topics were identified as follows:

### LAND USE

Land uses surrounding the park and the Central Riverfront would not be modified by the alternatives analyzed in this EA. Additionally, the proposed changes are consistent with local land use laws. Therefore, this topic was dismissed from detailed analysis.

### ENVIRONMENTAL JUSTICE

Executive Order 12898, Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations, was published in February 1994 and requires federal agencies to identify and address disproportionately high and adverse human health or environmental impacts of its programs, policies, and activities on minority and low-income populations. In their guidance document, the Environmental Protection Agency (EPA) defines a community with potential Environmental Justice indicators as one that has a greater percentage of minority or low-income populations than an identified reference community (state or county) (EPA 2004). The EPA guidance defines a minority as “Individual(s) who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. Minority populations are considered groups of minority individuals in which, “(a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis” (CEQ 1997).

EPA guidance further notes, “. . .Low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census’ Current Population Reports, Series P-60 on Income and Poverty. In identifying low-income populations, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect” (CEQ 1997). The Census Bureau defines a poverty area as a census tract with 20 percent or more of its residents below the poverty level (U.S. Census 2012).

According to the American Community Survey, the census tract surrounding the park has a minority population of less than 50 percent and is not considered a poverty area; however, the census tracts directly to the north and south of the park, into which the Central Riverfront extends, have minority populations greater than 50% and higher poverty levels. The census tract directly across the river in East St. Louis also has a minority population of greater than 50% and higher poverty levels (U.S. Census 2010). The City of St. Louis has higher percentages of individuals living in poverty and a higher percentage of minority populations than either St. Louis County or the State of Missouri. In addition, the City of East St. Louis has higher percentages of individuals living in poverty, and a higher percentage of minority populations than either St. Clair County or the State of Illinois (U.S. Census 2010).

As low income and minority populations exist within the City of St. Louis and the City of East St. Louis, the EPA’s “Environmental Justice in the NEPA Process” website (<http://www.epa.gov/compliance/nepa/nepaej/>) was consulted to determine how to consider potential impacts to Environmental Justice communities (EPA 2012). The Environmental Justice flowchart, provided in the U.S. Air Force guidance on Environmental Justice and available on EPA’s Environmental Justice NEPA website as a model framework, indicates that analysis of Environmental Justice does not need to occur if no impact would be caused

by the proposed action or if the impact is not considered adverse. The guidance defines an adverse impact as an impact that “would have a negative effect on human health or the environment that is significant, unacceptable, or generally above accepted norms” (U.S. Air Force 1997).

Adverse impacts, as defined by the U.S. Air Force, are not anticipated as a result of the proposed alternatives. It is also highly unlikely that the actions taken by the project would introduce materials into the environment that would have indirect adverse health impacts or impact the economic conditions of low income populations in St. Louis or East St. Louis. Any construction-related impacts from noise and air emissions would be short-term and temporary and best management practices would be implemented during construction. While there are communities with populations of minorities or low-income peoples in the vicinity of the project, they would not be directly affected by the alternatives and the alternatives would not result in any impacts that would be specific to a minority or low-income community.

Therefore, based on the EPA and U.S. Air Force guidance, Environmental Justice was dismissed as an impact topic requiring detailed analysis.

#### **PRIME AND UNIQUE FARMLANDS**

There are no farmlands within Jefferson National Expansion Memorial or along the Central Riverfront. Therefore, this topic was dismissed from detailed analysis.

#### **WILD AND SCENIC RIVERS, ECOLOGICALLY CRITICAL AREAS, OR OTHER UNIQUE NATURAL RESOURCES**

The park and the Central Riverfront have been heavily manipulated by human activity and development; as such, there are no existing ecologically critical areas or unique natural resources within the bounds of the park or the Central Riverfront. Thus, this impact topic was dismissed from detailed analysis.

#### **SACRED SITES**

Currently there are no known sacred sites in the general area of the park or Central Riverfront, but continued efforts to consult with interested groups will be made by the NPS through the NEPA and Section 106 processes. A sacred site must be identified by an Indian tribe or individual, as defined by Executive Order 13007:

any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site.

Because no sacred sites have been identified within the park, this issue was dismissed from further analysis. Should any sacred sites be identified after the publication of the EA, they would be treated in accordance with the applicable laws and policies, and appropriate consultation would be undertaken.

#### **INDIAN TRUST RESOURCES**

Indian trust resources are “those natural resources reserved by or for Indian tribes through treaties, statutes, judicial decisions, and executive orders, which are protected by a fiduciary obligation on the part of the United States” (NPS 2006). There are no Indian trust resources within Jefferson National Expansion Memorial and therefore the topic was dismissed from detailed analysis.

#### **ETHNOGRAPHIC RESOURCES**

Ethnographic resources are defined by the NPS as “the cultural and natural features of a park that are of traditional significance to traditionally associated peoples. These peoples are the contemporary park neighbors and ethnic or occupational communities that have been associated with a park for two or more generations (40 years), and whose interests in

the park's resources began before the park's establishment" (NPS 2006). No ethnographic resources have been documented or are known to be associated with the park. Thus, this topic was dismissed from detailed analysis. Should any ethnographic resources be identified after the publication of the EA, they would be treated in accordance with the applicable laws and policies, and appropriate consultation would be undertaken.

### **AIR QUALITY AND CLIMATE CHANGE**

Existing emission sources in the vicinity of the park and the Central Riverfront include vehicular emissions from sources such as buses, visitors looking for parking, and visitor drop-offs and pick-ups; emissions from facility operations and park grounds maintenance and operations; and riverfront activities such as boat tours, shipping/commercial boating activities, and helicopter tours. Global climate change resulting from the accumulation of emissions of heat-trapping gases in the atmosphere has the potential to increase risks to human health and to terrestrial and aquatic ecosystems (EPA 1997). The Clean Air Act of 1963 (42 USC 7401 et seq.) was established to promote the public health and welfare by protecting and enhancing the nation's air quality. The Clean Air Act and the 1970 and 1990 Clean Air Act Amendments require public land managers, including NPS Park Superintendents, to protect air quality in national parks.

Construction activities associated with the alternatives have the potential to produce dust and result in short-term increases in vehicle emissions in the vicinity of the proposed site. However, these emissions would be temporary in nature (only during construction). To minimize potential effects, Best Management Practices (BMPs) related to vehicle and equipment emissions and dust suppression would be implemented. Construction emissions would not impact regional or global climatic patterns.

Increased emissions due to facility expansion and an increase in visitation could occur in the long term, but not to the point where there would be more than negligible effects from an increase in emissions and local

greenhouse gases or any measurable effects on global greenhouse gas levels. Sustainable maintenance and building practices would be implemented to minimize potential effects. Thus, short-and long-term impacts would be negligible and air quality and climate change were dismissed from further analysis.

### **WETLANDS**

The National Wetlands Inventory (NWI) indicates that there are at least two wetlands in the park. Both of the wetlands are classified in the NWI as excavated wetlands, indicating they may be artificially created. A site visit was conducted as part of the GMP to verify the excavated wetlands illustrated on the NWI maps. The wetlands shown on the park grounds are the two designed reflecting pools. The reflecting pools are not wetlands as defined by the U.S. Army Corps of Engineers (USACE) and EPA and do not fall under the jurisdiction of the USACE. Therefore, wetlands were dismissed from detailed study.

### **SOILS AND GEOLOGIC RESOURCES**

The alternatives would require excavation and site grading for proposed construction; however, to the extent feasible, excavated soils would be amended and stockpiled for reuse on the site. Best management practices would be utilized during construction to prevent soil erosion. Because the types of soils that may be impacted are either artificial fill or typical soils that have no important characteristics, this topic was dismissed from further consideration.

### **WILDLIFE**

The park and the Central Riverfront are within a highly urbanized landscape and resident wildlife found in the park and along the Central Riverfront would be wildlife generally adapted to urban areas, including small mammals such as squirrels and raccoons as well as various birds and other transient wildlife. The Mississippi River is also a major corridor for migratory birds. The St. Louis chapter of the National Audubon Society forged an agreement with the National Park Service to turn off the lights that illuminate the Gateway Arch during the spring and fall

migration to minimize any interference with birds' ability to navigate at night.

There is limited habitat for wildlife within the park and no riparian habitat on the west bank of the Mississippi River along the Central Riverfront. The park grounds consist of well-maintained turf areas beneath an overstory of ash, oak, pine, and cypress trees. There is little cover and few sources of food available for wildlife other than tree seeds and acorns. Wildlife that utilizes the park and Central Riverfront as habitat or for food sources could be temporarily displaced during construction; however, after construction the urbanized landscape of the park and the Central Riverfront would be maintained. Any impacts to wildlife would be minimal due to a lack of habitat in the park and along the Central Riverfront. Therefore, this topic was dismissed from further analysis

#### **FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES**

According to the U.S. Fish and Wildlife Service's website, the following listed threatened and endangered species are known to occur in St. Louis City, Missouri, St. Louis County, Missouri and St. Clair County, Illinois: Gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), Least tern (*Sterna antillarum*), Pallid sturgeon (*Scaphirhynchus albus*), Pink mucket (pearlymussel) (*Lampsilis abrupta*), Scaleshell mussel (*Leptodea leptodon*), Sheepnose mussel (*Plethobasus cyphus*), Snuffbox mussel (*Epioblasma triquetra*), Spectaclecase (*Cumberlandia monodonta*), Illinois cave amphipod (*Gammarus acherondytes*), Decurrent false aster (*Boltonia decurrens*), Mead's milkweed (*Asclepias meadii*), Eastern prairie fringed orchid (*Platanthera leucophaea*), and Running buffalo clover (*Trifolium stolonifereum*) (USFWS 2012).

While the above listed threatened and endangered species may be present at locations within St. Louis City and County, Missouri and St. Clair County, Illinois, the project area includes only those lands in downtown St. Louis within the existing park boundary and the adjacent Central Riverfront. No threatened and endangered species are known to be present within the project area. Due

to the urban environment and associated disturbances, it is highly unlikely that suitable habitat to support listed species would be available, now or in the future. Therefore, this topic was dismissed from further analysis

Additionally, although improvements to the east slopes of the park and the Central Riverfront would occur within the 100-year floodplain of the Mississippi River, the project must be designed to ensure no rise in the 100-year base flood elevation after improvements are constructed. This would minimize potential for any impacts to listed species which may occur in or near the river. The NPS sent a consultation letter to the U.S. Fish and Wildlife Service regarding the determination that the project would have no effect on listed species, their habitats, or proposed or designated critical (see Appendix B). Impacts to threatened and endangered species would be minimal as there are no known species within the project area and due to a lack of habitat in the park and along the Central Riverfront.

## **RELATED LAWS, POLICIES, PLANS, AND REGULATIONS**

### **GUIDING LAWS AND POLICIES**

Guiding legislative or judicial requirements and formal agency agreements are often established concurrently with the creation of a unit of the national park system, but can occur at a later date. The proposed action must work within the framework of these laws and policies. Relevant laws and policies include the following:

#### **1916 Organic Act**

The Organic Act (16 USC § 1) provides the fundamental management direction for all units of the national park system:

*[P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations. . . by such means and measure as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the*

*same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.*

The national park system General Authorities Act (16 USC § 1a-1 et seq.) affirms that while all national park system units remain “distinct in character,” they are “united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage.”

The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Further, amendments state that NPS management of park units should not “derogate[e] . . . the purposes and values for which these various areas have been established.”

The 1978 Redwood Amendment supplemented the General Authorities Act and amended the Organic Act to direct the NPS to protect, manage and administer park lands “in light of the high public value and integrity of the National Park System,” and to refrain from administering park lands in a way that degrades “the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress” (16 USC 1a-1).

### **National Environmental Policy Act, 1969, as Amended**

NEPA is implemented through regulations of the Council on Environmental Quality (40 CFR 1500–1508). The Department of Interior has established regulations to use for compliance with NEPA and CEQ regulations (43 CFR 46.10–450). The NPS has in turn adopted procedures to comply with the act and the CEQ regulations, as found in Director’s Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making (NPS 2011), and its accompanying Handbook (NPS 2001). This EA complies with NEPA and the procedures outlined in Director’s Order 12.

CEQ regulations (40 CFR 1502.20), Department of Interior NEPA regulations (43 CFR 46.140), and Section 7.4 of the NPS DO-12 Handbook encourage the use of a

tiering process to establish a procedural connection between a large-scale planning document and the more site-specific projects being developed. CEQ regulations (40 CFR 1502.20) encourage the use of a tiering process to eliminate repetitive discussion of the same issues when a broader NEPA document was previously published. The Department of Interior NEPA regulations (43 CFR 46.140) provide more specific direction on tiering and state that an “environmental assessment prepared in support of an individual proposed action can be tiered to a programmatic or other broader-scope environmental impact statement. An environmental assessment may be prepared, and a finding of no significant impact reached, for a proposed action with significant effects, whether direct, indirect, or cumulative, if the environmental assessment is tiered to a broader environmental impact statement which fully analyzed those significant effects. Tiering to the programmatic or broader-scope environmental impact statement would allow the preparation of an environmental assessment and a finding of no significant impact for the individual proposed action, so long as any previously unanalyzed effects are not significant.” In addition, these regulations state that “to the extent that any relevant analysis in the broader NEPA document is not sufficiently comprehensive or adequate to support further decisions, the tiered NEPA document must explain this and provide any necessary analysis.”

### **National Historic Preservation Act (1966)**

The NHPA of 1966, as amended, is the guiding legislation for the preservation of historic properties. As broadly defined by 36 CFR 800, historic properties are “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places.” Maintained by the NPS, the National Register of Historic Places is the nation’s official list of cultural resources worthy of preservation.

Pursuant to Section 106 of the NHPA, federal agencies are required to consider the effects of a proposed project on properties listed in, or eligible for listing in, the National Register of Historic Places. In the event that a project may affect a historic property the lead agency must

enter into consultation with the State Historic Preservation Officer, the Advisory Council on Historic Preservation, and other interested agencies and individuals to identify historic properties that could be potentially affected, assess potential adverse effects, and resolve the adverse effects through mutually agreed upon mitigation measures.

Section 110 of the NHPA sets out broad historic preservation responsibilities for federal agencies, ensuring that preservation is fully integrated into ongoing programs.

The Secretary of the Interior designated Jefferson National Expansion Memorial Gateway Arch an NHL in 1987. The government of the United States designates NHLs as places of exceptional national significance worthy of special protection under the National Historic Sites Act of 1935 and Section 110 (f) of the National Historic Preservation Act (NHPA) of 1966, as amended. The over 62-acre Jefferson National Expansion Memorial Gateway Arch National Historic Landmark includes the Gateway Arch and surrounding designed landscape.

### **Management Policies 2006**

The NPS Management Policies 2006 (NPS 2006) is the basic NPS-wide policy document, adherence to which is mandatory unless specifically waived or modified by the NPS Director or certain Departmental officials, including the Secretary of the Interior. Actions under this EA are guided in part by these management policies. In addition to determining the environmental consequences of implementing the preferred and other alternatives, NPS Management Policies 2006 (Section 1.4) requires analysis of potential effects to determine whether or not proposed actions would impair a park's resources and values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always 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 on park resources and values when necessary and appropriate to fulfill the purposes of the park. That discretion is limited by the statutory requirement that the National Park Service must leave 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 otherwise would be present for the enjoyment of those resources or values (NPS 2006). Whether an impact meets this definition depends on the particular resources that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts. An impact on any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or;
- identified in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated. Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park.

Impairment findings are not necessary for visitor experience, socioeconomics, public health and safety, environmental justice, land use, and park operations, etc., because impairment findings relate back to park resources and values. Updated guidance in Non-Impairment Determinations and the NPS NEPA Process, issued in October 2011, requires the analysis of impairment be done only for the selected alternative and that the determination be appended to the decision document. An impairment finding for the selected alternative will be prepared based upon the analysis of impacts in this document and made part of the decision document.

Specific sections of the NPS Management Policies 2006 are particularly relevant to the proposed alternatives. The protection of Natural Resources, addressed in Section 4.1.3, Evaluating Impacts on Natural Resources, requires the NPS to ensure that the environmental costs and benefits of proposed operations and development are fully and openly evaluated before taking actions that may impact the natural resources of parks, and that mitigation measures that include principles of sustainable park management be included.

Floodplains are addressed in Section 4.6.4. This section states that the NPS will: “ (1) manage for the preservation of floodplain values; (2) minimize potentially hazardous conditions associated with flooding; and (3) comply with the NPS Organic Act and all other federal laws and executive orders related to the management of activities in flood-prone areas, including Executive Order 11988 (Floodplain Management), the National Environmental Policy Act, applicable provisions of the Clean Water Act, and the Rivers and Harbors Appropriation Act of 1899.

Section 5.3.1 deals with the Protection and Preservation of Cultural Resources and notes that the NPS will protect cultural resources through effective means without compromising the integrity of the resources. The treatment of Archeological Resources, Cultural Landscapes, Historic and Prehistoric Structures, and Museum Collections are addressed in Section 5.3.5.1, Section 5.3.5.2, Section 5.3.5.4, and Section 5.3.5.5, respectively.

The proposed changes to the park would be subject to the requirements set forth for the protection of these resources.

Section 9.1.3 deals with Construction and requires the incorporation of sustainable principles and practices into design, siting, construction, building materials, utility systems, recycling of all unusable materials, and waste management. It also requires the implementation best management practices for all phases of construction activity.

### **Director’s Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making and Handbook**

NPS Director’s Order 12 (NPS 2011) and its accompanying handbook (NPS 2001) provides the foundation for how the NPS complies with NEPA. Director’s Order 12 and its handbook set forth a planning process for incorporating scientific and technical information and establishing a solid administrative record for NPS projects. Director’s Order 12 requires that impacts to park resources be analyzed in terms of their context, duration, and intensity. It is crucial for the public and decision makers to understand the implications of those impacts in the short and long term, cumulatively, and within context, based on an understanding and interpretation by resource professionals and specialists.

### **Director’s Order 28: Cultural Resource Management**

This director’s order sets forth the guidelines for management of cultural resources, including cultural landscapes, archeological resources, historic and prehistoric structures, museum objects, and ethnographic resources. This order calls for the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship.

### **Director’s Order 42: Accessibility for Visitors with Disabilities in National Park Service Programs and Services**

This director’s order was issued to establish operational policies and procedural guidance concerning accessibility for visitors with disabilities in NPS programs, facilities, and services. It is the goal of the NPS to ensure that all people have the highest level of accessibility that is reasonable to NPS programs, facilities, and services in conformance with applicable laws and regulations.

### **Director’s Order 77-2: Floodplain Management**

Director’s Order 77-2: Floodplain Management was issued in response to Executive Order 11988, Floodplain Management. Director’s Order 77-2 applies to all proposed NPS actions that could adversely affect the natural resources and functions of floodplains or increase flood risks. This includes those proposed actions that are functionally dependent upon locations in proximity to the water and for which non-floodplain sites are not practicable alternatives. For all proposed actions determined to be within a regulatory floodplain, a Statement of Findings (SOF) must be prepared. An SOF was prepared for this project and is located in Appendix A of this EA.

### **National Icons and Monuments**

As a matter of national security, the Gateway Arch has been designated a National Icon by the U.S. Department of the Interior. Icons are internationally recognized symbols of national identity that are seen as potential terrorist targets. Increased security and antiterrorism measures have been instituted that will continue to influence management decision-making for the foreseeable future.

### **OTHER LAWS/EXECUTIVE ORDERS**

#### **Executive Order 11988 – Floodplain Management**

This executive order requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with

**Statement of Findings (SOF) – Separately identifiable document attached to NPS NEPA decision documents that explains why an action would adversely impact wetlands or floodplains, what alternatives were considered to avoid these impacts and why they are not suitable, mitigation measures to minimize adverse impacts, and what the effects would be on floodplain and/or wetland values. Preparation, review, and public disclosure of statements of findings are key elements of the NPS process for implementing Executive Order 11990, Protection of Wetlands, and Executive Order 11998, Floodplain Management.**

construction within and modifications to floodplains. Federal agencies are to avoid direct and indirect support of floodplain development whenever there is a practicable alternative.

#### **Executive Order 11593 – Protection and Enhancement of the Cultural Environment**

This executive order directs the NPS to support the preservation of cultural properties, to identify and nominate to the National Register cultural properties within the park, and to “exercise caution . . . to assure that any NPS-owned property that might qualify for nomination is not inadvertently transferred, sold, demolished, or substantially altered.”

#### **Executive Order 13514: Federal Leadership in Environmental, Energy, and Economic Performance**

This executive order sets sustainability goals for federal agencies and focuses on making improvements in their environmental, energy, and economic performance. The order expands on the energy reduction and environmental performance requirements identified in Executive Order 13423 Strengthening Federal Environmental, Energy and Transportation Management. It requires federal agencies to set a 2020 greenhouse gas emissions reduction target; increase

energy efficiency; reduce fleet petroleum consumption; conserve water; reduce waste; support sustainable communities; and leverage federal purchasing power to promote environmentally responsible products and technologies.

### **Architectural Barriers Act**

This Act requires all buildings and facilities constructed or renovated with Federal funds to be accessible to, and usable by, physically disabled persons. The U.S. Architectural and Transportation Barriers Compliance Board (Access Board) was created to monitor and enforce compliance with the law. The Uniform Federal Accessibility Standards were established to provide uniform standards for the design, construction, and alteration of buildings so that individuals with disabilities will have ready access to and use of them in accord with the Architectural Barriers Act of 1968. All new and altered buildings and facilities must be designed and constructed in conformance with these standards unless otherwise exempt.

### **Americans with Disabilities Act**

The Americans with Disabilities Act of 1990 prohibits discrimination in employment, telecommunications, transportation, access to facilities and programs provided by State and local government entities, and access to the goods and services provided by places of public accommodation such as lodging, health, and recreation facilities. Under the Act, buildings and facilities must be made accessible to and usable by people with disabilities. While the Act does not technically apply to the Federal Government, its more comprehensive accessibility design standards for buildings and facilities, the Americans with Disabilities Act Accessibility Guidelines, are used by the Department of the Interior unless the Uniform Federal Accessibility Standards provide a higher degree of accessibility.

### **International Building Code**

The International Building Code is a model building code used throughout the United States. Chapter 11 of the code addresses accessible design and construction of facilities for physically disabled persons, including guidance for routes, entrance and egress, parking and passenger loading, and other features.

### **Public Rights of Way Accessibility Guidelines**

The U.S. Architectural and Transportation Barriers Compliance Board (Access Board) publishes accessibility guidelines for public rights-of-way that cover pedestrian access to sidewalks and streets, including crosswalks, curb ramps, street furnishings, pedestrian signals, parking, and other components of public rights-of-way.

### **RELATED JEFFERSON NATIONAL EXPANSION MEMORIAL PLANNING DOCUMENTS**

#### **General Management Plan/Environmental Impact Statement**

The park completed a GMP in 2009. The impacts of the GMP were evaluated in an EIS that was prepared concurrently with the GMP. The GMP outlined a series of management zones intended to articulate and implement long-term goals for resource conditions, visitor experience, and appropriate development that could occur on the park grounds. The preferred alternative identified in the GMP (the Selected Action in the Record of Decision) included the concept of revitalizing the park through expanded programming, facilities, and partnerships. A primary element of the preferred alternative was an international design competition (realized as Framing a Modern Masterpiece: The City + The Arch + The River 2015) that explored various approaches for revitalizing the park grounds and connections to surrounding downtown St. Louis, as well as East St. Louis, Illinois, located across the Mississippi River. The potential impacts associated with implementation of the winning design are being addressed in this EA.

The preferred alternative of the GMP (the Selected Action in the Record of Decision) directs that cultural resources at the park be managed to preserve and protect these important resources. The significant cultural resources and values of the park are to be protected, although sensitive rehabilitation of the designed landscape is permitted as long as the integrity of the NHL is preserved.

Rehabilitation, as defined by the Secretary's Standards for the Treatment of Historic Properties, involves protecting and maintaining the character-defining features of the designed landscape, but allowing the repair or replacement of deteriorated, damaged, or missing features and compatible new additions to accommodate new uses, provided they do not radically change, obscure, or destroy character-defining features. In support of the GMP, the Cultural Landscape Report (CLR) was developed to provide definitions and guidance for the character-defining features of the park.

#### **Long Range Interpretive Plan**

A Long Range Interpretive Plan provides a 5-7 year vision for a park's interpretive program and is consistent with other current planning documents. Interpretation seeks to make connections between a park's natural and cultural resources (those tangible and intangible treasures that a park was established to protect) and the lives, values, and experiences of park visitors.

The park's interpretive themes and the purpose of the park's museum collections are identified in the Draft Long Range Interpretive Plan, which drew from the 2009 GMP. The park's Draft Long Range Interpretive Plan also includes management goals and objectives for the park's natural and cultural resources.

#### **Cultural Landscape Report**

The NPS updated the CLR in 2010, documenting the park's landscape and analyzing its character-defining features. Specifically, the CLR documents the evolution of the Saarinen-Kiley plan and its implementation by the NPS, and describes the condition of landscape features and overall

character of the park grounds. The CLR evaluates the significance of the landscape based on the NHL nomination, assesses its integrity using National Register of Historic Places (National Register) standards, and identifies contributing and noncontributing features.

#### **Landscape Preservation Maintenance Plan**

The Landscape Preservation Maintenance Plan, completed in 2010, provides guidance for maintaining the character-defining woody vegetation and site structures of the park landscape in compliance with the Secretary of Interior's Standards and other NPS policies and guidance. It also provides a format for the recordation of ongoing maintenance practices at the park.

#### **Emerald Ash Borer Environmental Assessment**

The NPS completed an EA in 2011 that analyzed strategies for addressing the impact of the emerald ash borer (*Agrilus planipennis Fairmaire*) on the historic designed landscape at Jefferson National Expansion Memorial. Part of the strategy included identifying an appropriate tree species for replacing the Rosehill ash (*Fraxinus americana* 'Rosehill') trees in the historic planting along the walks with a different species that would be in keeping with the designed landscape, while minimizing the impact on NPS operations, and maintaining and enhancing the visitor experience (NPS 2011b).

#### **OTHER FEDERAL AGENCY PLANS, POLICIES, AND ACTIONS**

The Missouri Department of Transportation, in conjunction with FHWA, is conducting a concurrent EA to assess the effects of proposed changes to I-70 and Memorial Drive, including the potential for construction of a structure built over the depressed section of I-70 as well as changes to the freeway's ramp system. The NPS, MoDOT, and FHWA will continue to work together to ensure the necessary compliance for these project elements are completed.

In addition, the Illinois Department of Transportation (IDOT), MoDOT, and FHWA are in the process of constructing the new Mississippi River Bridge, to the north of the park. The bridge will provide a new connection between St. Louis and southwest Illinois, and includes the realignment and reconstruction of Interstate 70, as well as numerous local roadways on both sides of the river. The new bridge is anticipated to open in 2014.

### **STATE AND LOCAL LAWS, REGULATIONS, AND POLICIES**

#### **Easements, Permits, and Other Agreements**

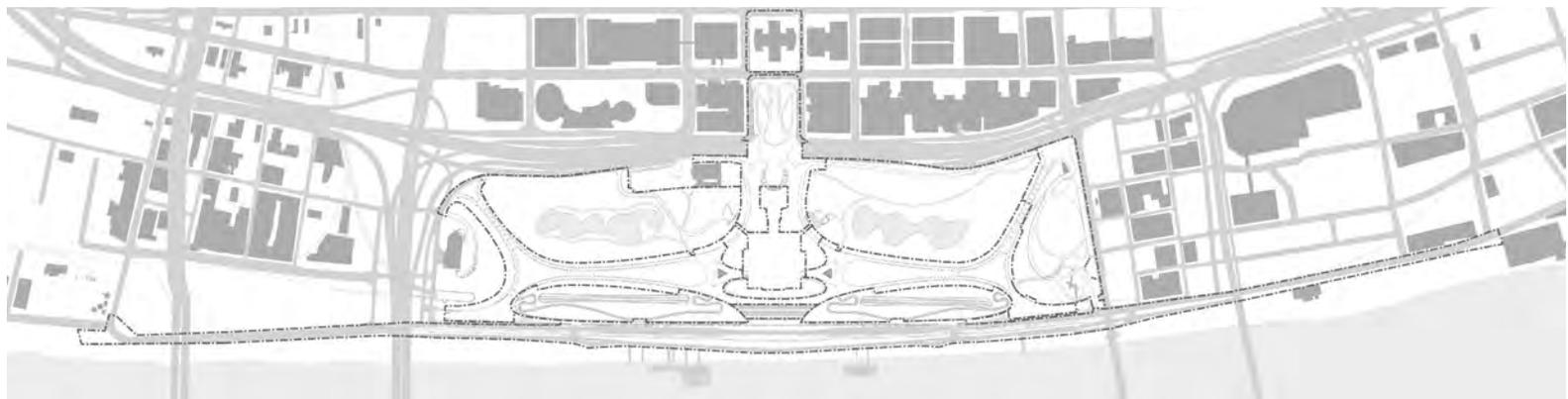
Easements exist for all railroad, street, and highway transportation corridors that cross the park boundaries, as well as utility and communication lines. Separate agreements for utility corridors and maintenance of associated infrastructure exist on a case-by-case basis. An indefinite permit authorized by the US Army Corps of Engineers (USACE) covers NPS buildings, retaining walls, planting areas, and levee roadway along the west bank of the river constructed before December 31, 1963.

A cooperative agreement between the NPS and the City of St. Louis permits redevelopment of the levee by the city and provides for joint control of its use following development. An easement agreement, signed in 1963 between the National Park Service, the State Highway Commission of Missouri, and the City of St. Louis, provides for the interstate highway infrastructure and its maintenance and repair within the park boundaries. Agreements with Metro Business Enterprises (Metro) cover the operation of the existing Arch Parking Garage and Arch tram, and agreements with Jefferson National Parks Association (JNPA) cover the supplementing of interpretation and education programs through the sale of theme-related books and merchandise. An agreement with the Archbishop of St. Louis provides for cooperation in the preservation and interpretation of the Old Cathedral.

### **City of St. Louis Land Use Planning**

Planning actions at the park are exempt from local planning and permitting requirements; however, the park is an influential part of St. Louis' downtown fabric and the Gateway Arch is symbolic of the city. Local planning goals, policies, and plans for circulation, land use, recreation, and cultural resources may complement the park, and its goal to create better connections to the surrounding city.





# 2. Alternatives

Jefferson National Expansion Memorial  
Environmental Assessment for Implementing CityArchRiver Initiative Elements



# Alternatives

## INTRODUCTION

This chapter describes the various actions that could be implemented to fulfill the goal of revitalizing the park and the Central Riverfront. NEPA requires federal agencies to explore a range of reasonable alternatives that address the purpose of and need for the action. The alternatives under consideration must include a “no action” alternative as prescribed by 40 CFR 1502.14. Action alternatives may originate from the proponent agency, local government officials, or members of the public at public meetings or during the early stages of project development. Alternatives may also be developed in response to comments from coordinating or cooperating agencies.

The NPS and Great Rivers Greenway District (GRG) explored and objectively evaluated three alternatives in this plan/EA. A no-action alternative (alternative 1) and two action alternatives (alternatives 2 and 3) are described in this chapter. Alternative 1, the no-action alternative, is a continuation of current NPS management with no major modifications or improvements to the park or the Central Riverfront. On park lands, the overall design approach of the action alternatives was guided by the 2009 Final Jefferson National Expansion Memorial General Management Plan and Environmental Impact Statement and the analysis and treatment recommendations included in the 2010 update to the Jefferson National Expansion Memorial Cultural Landscape Report. For the two action alternatives, the preliminary concepts and schematic designs for the park and the Central Riverfront were informed by the goals established in Framing a Modern Masterpiece | The City + The Arch + The River 2015 design competition, as well as extensive

stakeholder and public input. The findings and recommendations of NPS Value Analysis workshops, undertaken during the summer of 2011, further refined and developed concepts from the design competition. These alternatives are the result of internal scoping and public scoping, and in accordance with NEPA, they meet the overall purpose of and need for the project, and the objectives, as described in chapter 1.

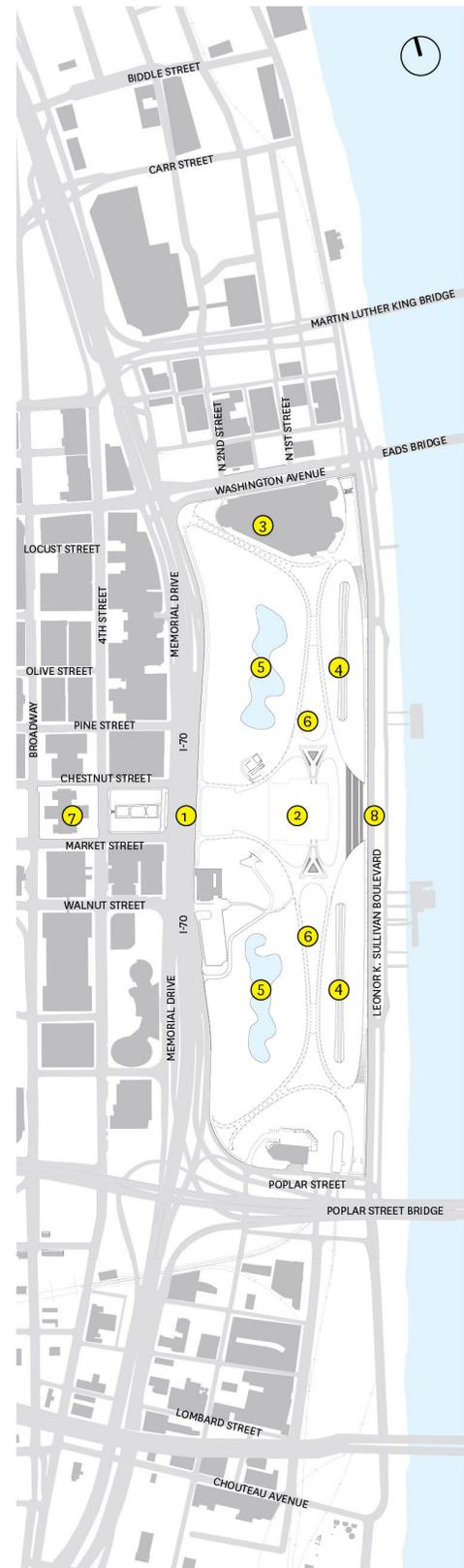
In this chapter, the alternatives are described by parkwide strategies that address the overall park, seven distinct project areas within the park, and an eighth project area that includes land within, adjacent to, and outside the park (the Central Riverfront). Parkwide strategies include proposed changes to security, accessibility, topography and grading, planting, and parking. Descriptions of the eight project areas are provided below. Actions that are common to the two action alternatives (2 and 3) for all project areas are also presented. In addition, this chapter describes mitigation measures, construction approaches, the environmentally preferred alternative, the NPS preferred alternative, and provides a comparison of environmental consequences.

Both action alternatives share the same framework of project areas. However, each alternative is distinct from the other based on the scope and character of proposed improvements within the framework of project areas.

**GRAPHICS** depicting project elements are provided for illustrative purposes to convey the design concepts. As design work continues during the detailed design process, changes could occur.

The project areas are shown in Figure 5 (the no-action alternative site plan) and include:

- (1) The West Gateway encompasses Luther Ely Smith Square and the western entrance to the park, from North 4th Street at Luther Ely Smith Square across Memorial Drive/I-70 to the park.
- (2) The Visitor Center/Museum includes the existing facilities and exhibits at the underground Visitor Center and Museum of Westward Expansion.
- (3) The North Gateway is the area encompassed by the existing Arch Parking Garage, adjacent landscape, and Washington Avenue, up to the south face of the Eads Bridge.
- (4) The East Slopes include the east side slopes that surround the railroad open cut walls and tunnels to the north and south of the sides of the Grand Staircase, parallel and adjacent to Leonor K. Sullivan Boulevard.
- (5) The Reflecting Ponds comprise the areas surrounding and including the north and south reflecting ponds located between I-70 and the Processional Walks.
- (6) The Processional Walks include the existing system of pedestrian walkways and adjacent allées of trees.
- (7) The Old Courthouse includes the block occupied by the Old Courthouse (bounded by Chestnut Street, North 4th Street, Market Street, and Broadway) as well as the Old Courthouse building.
- (8) The Central Riverfront includes Leonor K. Sullivan Boulevard from Chouteau Avenue to Biddle Street, the adjacent historic cobble levee along the Mississippi River, the sidewalks on both sides of Leonor K. Sullivan Boulevard, and the infrastructure between the road and the historic levee. The area includes an existing floodwall/levee system regulated by the US Army Corps of Engineers.



● Project Area

Figure 5 Alternative 1 site plan showing existing conditions + project areas (Source: MVVA)

## ALTERNATIVE 1: NO-ACTION

The no-action alternative primarily reflects current conditions and activities at the park and the Central Riverfront (Figure 5). Under the no-action alternative, the park and the Central Riverfront would continue to function much the way they do today. The no-action alternative “sets a baseline of existing impacts continued into the future against which to compare impacts of action alternatives” (NPS 2001).

Over time, potential long-term deferred maintenance projects could occur at the park as funding becomes available. These projects are discussed in the Cumulative Impacts section in Chapter 4 of this EA. Actions proposed by other agencies that could impact the park are also discussed in the Cumulative Impacts section, including MoDOT’s action to construct the Park Over the Highway structure. In alternative 1, the Park Over the Highway would be landscaped by NPS after MoDOT’s construction is completed, creating a landscaped connection between the park and the city at the West Gateway.

### PARKWIDE STRATEGIES

#### Security

Under the no-action alternative, the existing perimeter security would be maintained as would the visitor security screening under the Arch at the current building entrances. Existing perimeter security includes bollards surrounding the edges of the park, while the existing visitor security screening procedures involve visitors passing through metal detectors at both existing public entrances to the Visitor Center/Museum at the Arch legs.

#### Topography and Grading

The Park Over the Highway landscape would require grading at the existing berm running north-south along the western edge of the park next to the Memorial Drive/I-70 corridor. The existing topography and grading in other areas of the park would remain unchanged.

#### NO-ACTION ALTERNATIVE

The alternative in which baseline conditions and trends are projected into the future without any substantive changes in management. Alternative 1 is the no-action alternative in this planning process.

#### ACTION ALTERNATIVE

An alternative that proposes a different management action or actions to address the purpose, need, and objectives of the plan; one that proposes changes to the current management. Alternatives 2 and 3 are the action alternatives in this planning process.

#### Planting

The plantings and turf throughout the park’s landscape would remain. General landscape maintenance and reconditioning would occur.

#### Parking

Parking would continue to be provided on the park grounds in the Arch Parking Garage for visitors and employees. Space for visitors to be dropped off in the parking lot adjacent to the Old Cathedral would continue to be available. Bus, RV, and oversize vehicle parking would continue to be accommodated along South Leonor K. Sullivan Boulevard/South Wharf Street south of the Poplar Street Bridge.

#### Accessibility

Circulation within and around the park includes pedestrian routes and pathways, only some of which are accessible for visitors with mobility disabilities. At present there are no accessible routes from within the park grounds to the Central Riverfront. The existing entrances to the Visitor Center/Museum do not meet accessibility codes, causing difficulties for visitors with mobility disabilities to enter. The slopes of the exposed aggregate walks heading east into the park from Memorial

**ACCESSIBILITY** is the design, construction and/or alteration of a building or facility that is in compliance with officially sanctioned design standards, and that can be entered, and used by individuals with a disability. Architectural accessibility is used in conjunction with the idea of program accessibility, a concept is used to ensure that programs, activities and opportunities provided to visitors and/or employees will be provided in such a way that individuals with disabilities are not excluded from, nor denied the benefits of, that program or activity.

Drive do not meet accessibility requirements. The currently accessible street-level entrance to the Old Courthouse would remain at the lift installed on the exterior of the building and the first floor of the courthouse would be accessible. The Park Over the Highway landscape would provide an accessible route between the park and the city. Accessibility would remain unchanged in other areas in the no-action alternative, as would accessible programs offered to visitors.

## PROJECT AREAS

### The West Gateway

The existing approach to the West Gateway of the park, involving pedestrians crossing Memorial Drive at signalized intersections would be replaced by the Park Over the Highway structure, to be constructed by MoDOT. The NPS would maintain the landscape portion of the Park Over the Highway, which would extend Luther Ely Smith Square and allow pedestrians direct access from Luther Ely Smith Square to the existing western approach to the Arch.

### The Visitor Center/Museum

The existing Visitor Center/Museum and its exhibits would remain and interpretive and educational programs would continue to be provided. More detail on the existing museum and exhibits is provided in Chapter 3 of this document. The visitor fees collected at the park

would continue to include the fee for the Ride to the Top of the Arch and the fee to view the films screened in the theaters at the Visitor Center/Museum. Fees to access exhibits and programming in the Visitor Center and the Museum of Westward Expansion, to enter the Old Courthouse, or to enter the Arch grounds would not be collected.

### The North Gateway

The existing Arch Parking Garage, adjacent landscape, and ranger station housed within the parking garage would remain. MoDOT's proposed changes to the highway and street infrastructure along the I-70 corridor would alter access to the Arch Parking Garage (Figure 6). These changes would close Washington Avenue between 1st Street and Memorial Drive (at the northwest intersection). Access to the Arch Parking Garage would be provided both through Laclede's Landing as well as via a "slip-lane" at the proposed northbound exit off the interstate highway at Washington Avenue. With the Washington Avenue ramps and intersection completed, the "slip-lane" would allow a single lane of traffic to turn right onto the eastbound only lane segment of Washington Avenue between Memorial Drive and North 1st Street, and proceed from there to the Arch Parking Garage or to Leonor K Sullivan Boulevard.

An additional pedestrian crossing at the vehicular "slip-lane" from I-70 onto Washington Avenue would be required to facilitate pedestrian access from the Washington Avenue intersection into the park. City access to the Arch Parking Garage would be from Washington Avenue, to North 3rd Street, to Laclede's Landing Boulevard, to North 2nd Street and then to the Arch Parking Garage (see the Cumulative Impacts section of Chapter 4 for more details about the proposed changes to the street network). Signage to address wayfinding to the Arch Parking Garage would be implemented.

### The East Slopes

The East Slopes would remain in their existing configurations.

### The Reflecting Ponds

The plantings and turf around the ponds would remain. The ponds would continue their stormwater retention function.



Figure 6 MoDOT vehicular movement changes to the North Gateway  
(Source: MVVA)

### The Processional Walks

The existing Processional Walks would be maintained. The approved Emerald Ash Borer Environmental Assessment and FONSI (EAB EA) would be implemented. It was written to address the threat posed by the emerald ash borer on the Rosehill ash trees in the park, including the ash trees that comprise the allées of trees adjacent to the Processional Walks. The approach of the emerald ash borer would be monitored and the ash trees would be replaced in a phased approach with a species to be selected by the NPS in accordance with the approved EAB EA (NPS 201b).

### The Old Courthouse

The exhibits at the Old Courthouse would remain and access into the Old Courthouse would be unchanged. The recently replaced exterior lift would continue to provide accessible entrance to portions of the first floor of the Old Courthouse.

### The Central Riverfront

The existing roadway, sidewalks, lighting, and utility infrastructure along Leonor K. Sullivan

Boulevard would remain unchanged. The current shared traffic/bicycle lanes would remain in their present condition, except for periodic re-painting of pavement markings. Curb ramps and crosswalks would remain unchanged and would not meet accessibility standards. Flooding events would continue to require placement of temporary traffic control devices for roadway closures. Post-flood cleanup operations by City of St. Louis personnel would continue to be required prior to re-opening the Central Riverfront to the public.

### CONSTRUCTION AND OPERATION COSTS

The net construction cost of this alternative would range between approximately \$6 million and \$8 million. Annual operating costs under this alternative would increase between \$100,000 and \$150,000. Identification of these costs does not guarantee NPS funding. Full project funding for both construction costs and annual operations and maintenance costs would most likely be provided by partners, donations and other non-federal and federal sources. In addition, the project would be designated to receive 30% of the revenue generated by a proposed sales tax increase for the benefit of parks and trails throughout the region.

## **ACTION ALTERNATIVES**

### **ELEMENTS COMMON TO ALL ACTION ALTERNATIVES**

The action alternatives (alternatives 2 and 3) would: alter visitor accessibility both to and within the park and the Central Riverfront; create new and enhance existing programming opportunities; and change plantings by implementing key unrealized parts of Dan Kiley's 1964 Final Conceptual Planting Plan. Changes to the existing landscape would maintain the integrity of the original design intent and the park's designation as a National Historic Landmark.

#### **PARKWIDE STRATEGIES**

##### **Security**

In alternatives 2 and 3, a continuous security perimeter would be established through the use of vehicle ram barrier walls (cast-in-place concrete retaining structures integrated as site walls) and bollards, similar to the existing security perimeter. The existing concrete planter barriers along the east side of the park would be replaced by vehicle ram barrier walls, designed with enough height and width to prevent pedestrian entry, except at designated walkways, which would have bollards. Bollards would also be located at the bottom of the overlook stairs. Vehicular access to the park for authorized vehicles would be provided at Luther Ely Smith Square via retractable bollards near the park entrances at the former intersections at Memorial Drive and Market Street and Memorial Drive and Chestnut Street. This access would be controlled and would be primarily for park maintenance vehicles. It would also serve for loading during special events and would accommodate emergency vehicle access. Day-to-day shipping and receiving operations at the Arch would continue existing operations, utilizing the existing delivery area at the Grounds Maintenance Facility. Where feasible, the existing perimeter bollards would be retained. The visual impact of the security features would be minimized by integrating them within the landscape. Retaining walls would double as vehicular ram barriers where

possible and bollards compatible with the historic landscape would be placed as needed. Coordination on the location access points through perimeter security, either via manual or hydraulic bollards, would occur with park maintenance and law enforcement.

The security concern near the ponds is the adjacency of the historic landscapes to the Memorial Drive/I-70 corridor. At the south pond, the existing line of security bollards would be preserved. At the north pond, the concurrent elimination of the Memorial Drive northbound lanes by MoDOT/City of St. Louis would allow for the retaining wall at the western edge of the park to serve as a vehicle ram barrier wall until the depressed lanes return to surface grade, at which point bollards would be used to continue the security perimeter.

The primary security concern along the Central Riverfront is the prevention of unauthorized vehicles from using the paths on the East Slopes as a means to access the upper levels of the park, while still accommodating NPS maintenance vehicles. A concrete vehicle ram barrier wall would run along the toe of the East Slopes at Leonor K. Sullivan Boulevard, with breaks at the Grand Staircase, the entrances to the accessible paths, and at the North and South Overlook stairs. Entrances to the East Slopes would have a bollard system that meets vehicle protection criteria, and also provide a means to be removed or lowered for maintenance needs. This wall and bollard system would replace the existing concrete planters currently serving as vehicular barriers along the eastern boundary to the park. The existing video surveillance of the Central Riverfront would be maintained and improved as needed by the Port Authority of the City of St. Louis. Other bollards throughout the park (Service Rd., Poplar St., Old Cathedral, Washington Avenue and the Arch Parking Garage) would remain or be replaced in kind.

Security and access to the Old Courthouse would be supplemented with exterior and street lighting, new traffic signals, and additional pedestrian and vehicular signage. There would be no additional visitor screening. In the interior renovated

exhibition space, mechanical, electrical, alarm and fire protection systems would be installed, upgraded, or replaced as needed.

### Accessibility

In alternatives 2 and 3, site improvements generally relate to accessibility for visitors with mobility disabilities. Enhancements and changes related to other disabilities would be addressed during the detailed design process through Citizens Universal Design Group, which was established to address all types of accessibility holistically, including the park's grounds, buildings, and exhibits.

Pedestrian accessibility would be added via a selective re-grading of routes that do not meet accessibility standards and the development of a new, secondary network of paths that would be compatible with and integrated into the historic landscape, including the landscapes around the north and south reflecting ponds. All proposed pathways, sidewalks, curb cuts, ramps and roadway crossings would meet or exceed the requirements or guidelines of the Americans with Disabilities Act, Architectural Barriers Act, International Building Code, Public Rights of Way Accessibility Guidelines, Director's Order 42 and NPS standards. Pathways would be graded so as not to exceed the 5% slope and 2% maximum cross slope. New paths would provide access across formerly difficult slopes, opening these landscapes up to all visitors. Mown lawn paths would provide another level of circulation throughout the pond landscapes. The accessible paths and routes for alternatives 2 and 3 would vary based on the overall alternative concept, as described later for each of the project areas.

Steep topographic change along Market Street prevents a continuous accessible pathway at the perimeter of Luther Ely Smith Square and would require the use of a stair and a ramp near the corner of Market and North 4th Streets. However, visitors arriving at the south drop-off along Market Street would have two additional points of access to the park. Accessible pedestrian curb ramps and signalized crossing areas would be provided at the public rights-of-way. Though the park as a whole would be made accessible for all

visitors, at this time, a solution for making the trams and operating deck at the top of the Arch accessible has not been identified.

Both alternatives would improve accessibility between the park and the Central Riverfront, ensuring universal access at multiple points along the one and one-half mile stretch of riverfront. While the Grand Staircase would remain the most obvious route for much of the general public, the accessible East Slope walks would provide a secondary pathway that would be used by many visitors. Benches and shade plantings along their lengths would provide visitors with comfortable places to rest along the way. Depending on the location of the ramps, visitors that need to access the site via a ramp system would be able to move between the Central Riverfront and the area at the top of the Grand Staircase, and/or to the Processional Walks near the top of the North and South Overlooks. Accessible pathways connecting the Central Riverfront pedestrian sidewalks to the cobble levee would be included in both alternatives.

Alternatives 2 and 3 would include new interior and exterior ramps for the Visitor Center/ Museum, supplementing the existing ramps at the Arch legs entrances, whose slopes are not universally accessible. The ramps, handrail, and guardrail system would be designed to have as minimal visual and structural impact to the existing architecture and landscape as possible. The interior ramps would be placed on top of the east sections of the existing split-ramps system. The ramps would lead from the Visitor Center/Museum to a new level platform at the location of the existing security screening area. A passage would be created through existing interior walls leading to doors opening onto the exterior ramps. The exterior ramps would follow the edge of existing pavement and terminate across from the Grand Staircase. A guardrail system would be installed at grade along the edges of the exterior ramps to protect visitors from falling into the depressed ramp. The guardrail would be designed to have as minimal a visual impact as possible. These changes would be subject to additional design review requirements and Section 106 compliance to ensure impacts to the cultural landscape and National Historic Landmark are minimized.

Alternatives 2 and 3 would provide new access to the first and second floors of the Old Courthouse. Two ramps would run along the south façade of the building and bring visitors to the uppermost level of the steps. To mitigate visual impact on the Courthouse exterior, these ramps would use light-weight steel construction. Smaller ramps or connecting platforms would make up the difference between the landing at the top of the Courthouse steps and the threshold to the first floor of the Old Courthouse. Within the Old Courthouse, access on the first floor is presently limited by changes in the finish floor elevation. Ramps and low infill platforms would be used to connect adjacent floor areas. Additionally, two new elevators would be installed to allow access to the second floor of the building. One would be located in the north wing for visitor access to the second floor, and one in the south wing to provide access to the park’s administration office. These changes would be subject to additional design review requirements and Section 106 compliance to ensure impacts to the historic structure are minimized.

### Topography/Grading

Proposed topographic changes within the project areas would be minimized by limiting re-grading to a few select areas, as driven by program and access requirements. At many locations, including the Reflecting Ponds, the East Slopes, and the Central Riverfront, re-grading would be used primarily to enable access and reduce maintenance-related issues such as stormwater runoff, erosion and flooding at Leonor K. Sullivan Boulevard.

The most extensive re-grading would likely be part of the proposed connection between the Old Courthouse and Luther Ely Smith Square to the west of the Memorial Drive/I-70 corridor and the park grounds to the east. Both alternatives 2 and 3 include the creation of park grounds situated on top of a structure over the depressed portion of I-70 between Market and Chestnut streets. The proposed structure would be constructed by MoDOT and NPS would landscape the structure. It would create continuous accessible west to east routes and a connected landscape across the Memorial Drive/I-70 corridor from Luther

**SWALES** help to manage stormwater runoff as part of a vegetated, open-channel management practice designed specifically to treat and attenuate stormwater runoff for a specified water quality volume. As stormwater runoff flows along these swales, or channels, it is treated through vegetation which slows the water to allow sedimentation, filtering through a subsoil matrix, and/or infiltration into the underlying soils.

Ely Smith Square across the park and to the bottom of the Grand Staircase.

Entering the park from the west, the existing Processional Walks between the sidewalk at Memorial Drive and the existing entrances to the Arch are separated by a steeply sloped berm. This creates conditions where slopes exceed what is required for pedestrian accessibility compliance. The proposed action would re-grade the walks to both meet the proposed elevations at Luther Ely Smith Square, as well as bring the grades within compliance for pedestrian accessibility.

Implementing a well-integrated accessible west to east route across the park would require re-grading the existing berm running north-south along the western edge of the park next to the Memorial Drive/I-70 corridor. This re-grading would be implemented to improve drainage, provide accessible pedestrian connections and accommodate new program elements. Care would be taken to minimize the visual impact of such topographic changes to the historic landscape and protected viewsheds. Potential berm changes for alternatives 2 and 3 would vary based on the overall alternative concept, as described later for each of the project areas. These changes would be subject to additional design review requirements and Section 106 compliance to ensure impacts to the cultural landscape and National Historic Landmark are minimized.

The elevation of Leonor K. Sullivan Boulevard would be raised along the Central Riverfront, which would require the sidewalks adjacent

to the park along the East Slopes, the overlook stairs, and the Grand Staircase to be raised as well. New grading would be required between the East Slopes and the new sidewalks adjacent to the raised height of the roadway. To balance excavation and fill requirements across the project, and reduce the need for hauling soils offsite and importing additional soils, excavated soil from one project area may be used as fill in other project areas should it be deemed acceptable for use as fill material. A protocol for fill material would be developed during the detailed design process to ensure re-used fill does not contain artifacts and is culturally sterile. Additionally, top soil of acceptable quality in impacted areas would be stockpiled and amended as needed for re-use. Soil amendment strategies would mitigate existing deficiencies, and would reduce the need for importation of expensive planting soils. The proposed new paths throughout the landscape would use subtle cut and fill to create the accessible path network. Soil amendments in these areas would reduce the need to import additional planting soil.

Subtle grading around the ponds and new paths would create swales to catch and detain storm water runoff prior to infiltration. The new, gentle swale areas would have overflows directed to a discreet perimeter drainage system at the back of the reflecting pond walls that would be connected to the existing stormwater conveyance system. Shallow grass-lined swales along the upland side of introduced pathways would further slow and redirect surface runoff and debris from entering the reflecting ponds. The implementation of a conservation mowing regimen would also limit runoff while maintaining the original design intent of Dan Kiley's 1964 Final Conceptual Planting Plan. New grading would be subtle and designed to retain the overall character of the existing topography.

### Planting

Proposed plantings in alternatives 2 and 3 would support the goals of the Cultural Landscape Report (NPS 2010) regarding strengthening of the plantings spatial organization as intended per Dan Kiley's

Final Conceptual Planting Plan (Office of Dan Kiley 1964). Proposed planting strategies within contributing areas follow the original design intent and implement compatible sustainable management practices. Within non-contributing areas, plantings would be selected to be compatible with the historic landscape, to enhance visitor experience, to complement existing features, and to facilitate programmatic requirements established in the GMP. In these areas, plantings would be designed to retain character-defining viewsheds. Existing trees would remain as possible.

Planned planting typologies would include:

**HIGH USE TURF:** a grass mixture coupled with appropriate soils and amendments to prevent erosion and compaction. This would reduce the development of bald patches within lawn surfaces. These plantings are intended to be used in areas where visitor use is expected to be moderate to heavy.

**CONSERVATION MOWN AREAS:** a low-maintenance grass mixture that requires less mowing and irrigation than conventional lawn surfaces. This would reduce maintenance costs and surface runoff. These areas would retain the current monolithic, fine-textured, lawn character of the existing plantings. These plantings are intended to be used in areas where visitor use is expected to be light to moderate.

New plantings of understory and canopy trees throughout conservation mown areas would be used to strengthen the historic integrity of the landscape's spatial organization (i.e., the open mown viewshed area would be framed by trees). Species selection would be determined based on a process evaluating formal qualities as they relate to the original design intent, as well as horticultural value for the region.

**WOODLAND PLANTINGS:** areas of mixed vegetation, comprising the range of plant types found in a hardwood forest, including deciduous canopy trees, smaller understory trees and shrubs, and low groundcovers. These plantings are intended to be used in areas where visitor use is limited to pathways

and other paved areas. The typology references the spatial qualities achieved by the placement of denser plantings per Dan Kiley’s 1964 Final Conceptual Planting Plan.

**SINGLE-SPECIES ALLÉE PLANTINGS:**  
The existing allée consists of a single tree species planting of “Rosehill” White Ash (*Fraxinus americana*), making this important feature susceptible to deforestation by the emerald ash borer, an invasive insect whose larvae feed specifically on ash trees. The emerald ash borer has already caused widespread devastation throughout Canada and the upper Midwest, and was confirmed in Missouri in 2008.

Alternatives 2 and 3 would replace the allée trees in phases. In accordance with the approved EAB EA (NPS 2011b) written to address the threat posed by the emerald ash borer, a single species with trees of uniform height, spread, and caliper would be selected for the allée plantings (Figure 7). A replacement species would be selected by the NPS in accordance with the EAB EA (NPS 2011b).

At Luther Ely Smith Square, new plantings of canopy trees would be conceived to reinforce the Saarinen vista in the same manner as the existing allées. New plantings would

be differentiated from the existing historic landscape in that new canopy trees would be distinguished by the use of both a different tree species and a different planting pattern.

Existing irrigation equipment would be retained, upgraded, or replaced as necessary to serve the action alternative planting areas. With the proposed planting plans, the need for irrigation, however, would be reduced by introducing less intensive management strategies such as conservation mowing and selecting drought-tolerant mixes and species. Where new irrigation systems are required, current irrigation technology could be applied to further reduce potable water usage. The action alternatives’ maintenance regime would be compatible with organic treatments that reduce the application of pesticides and fertilizers.

#### Utilities

Existing utilities, in particular the HVAC system for the Visitor Center/Museum, would be adapted to provide for expanded structures within the park. New utilities required to serve proposed new project elements and for construction would be designed and installed to mitigate impacts to the historic landscape and to comply with all applicable codes.

Figure 7 Proposed North Pond Allee Planting (Source: MVVA)



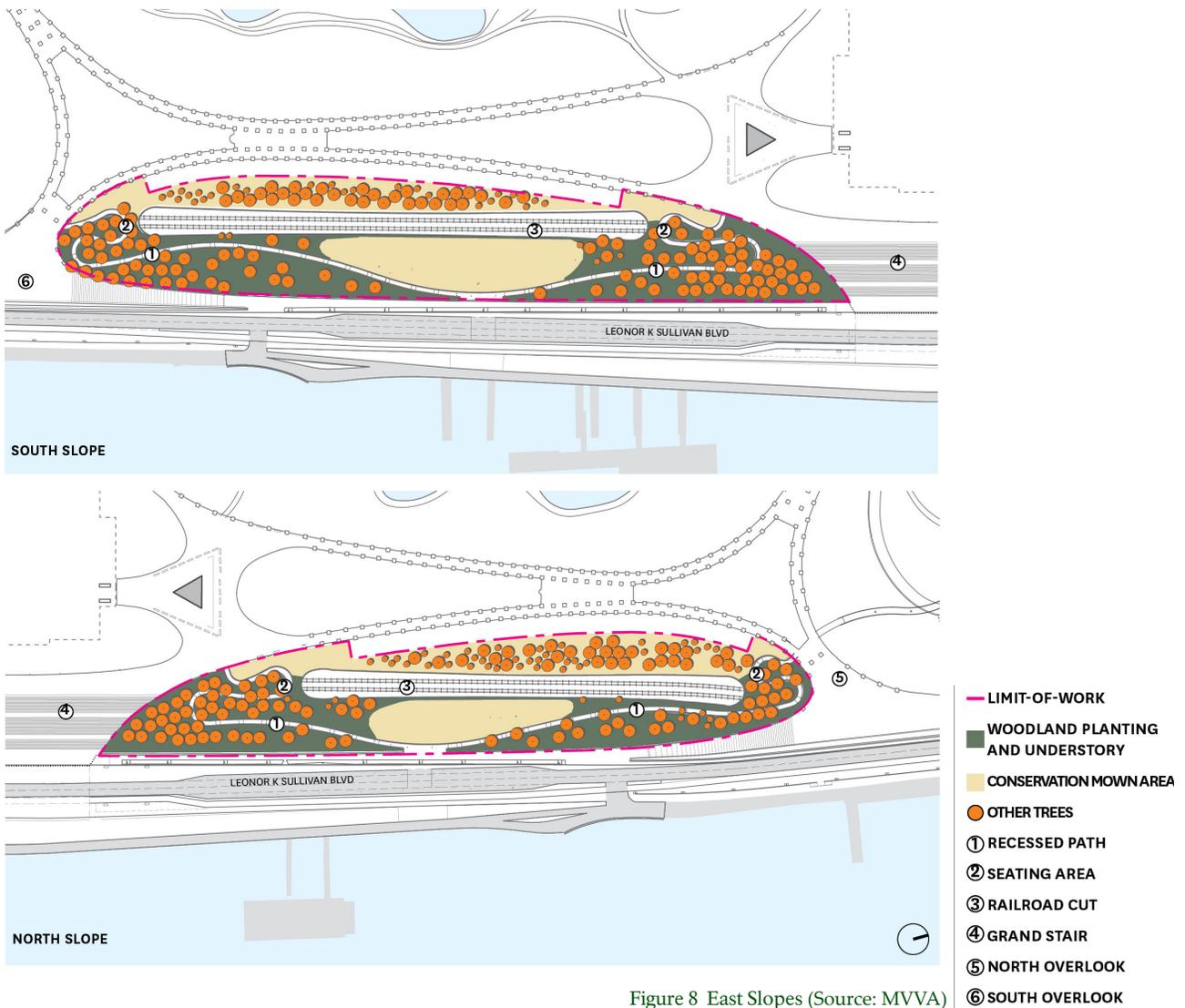


Figure 8 East Slopes (Source: MVVA)

## PROJECT AREAS

### East Slopes

As depicted in Figure 8, two to four universally accessible paths discreetly integrated into the topography would lead visitors from the top of the Grand Staircase and the overlooks down to the Central Riverfront. Benches along the paths would allow visitors to rest and enjoy long views of the river, and would be located to provide train-spotting opportunities as trains move through the railroad cuts and tunnels.

The combination of steep topography and overhead clearance requirements for the rail

tunnels running across the site dictate the serpentine shapes of the proposed paths. In order to minimize their visual impact, the paths would be set below grade within two low retaining walls. Installation of the paths would require fairly extensive regrading. Grading across the site would be performed to balance cut and fill in order to limit the import and export of fill where feasible. Utility connections would be necessary along the length of the paths in order to power the new path lighting and drain stormwater. The general form of the existing slopes would be retained while accommodating the new path systems.



Figure 9 North and South Ponds (Source: MVVA)

The East Slopes would be planted with a combination of conservation mown areas and woodland planting. Breaks in the tree canopy would allow views of the river at strategic points along the paths. The conservation mown areas that would be located in the areas between the east edges of rail tunnels and the bottom of the slopes are intended for sitting and viewing the river and for large event gatherings. These plantings are intended to better reflect the character of Dan Kiley’s 1964 Final Conceptual Planting Plan as well as improve maintenance operations.

### Reflecting Ponds

Alternatives 2 and 3 would provide new universally accessible paths into the landscapes around the North and South

reflecting ponds (Figure 9). Subtle grading around the ponds and new paths would create swales to catch and detain storm water runoff. These changes may require some retrenching of path edge utility lines (water and electric) as well as reconfiguration of stormwater drainage connections to existing combined sewers. The implementation of a conservation mowing regime would also limit runoff while maintaining the original design intent of Dan Kiley’s 1964 Final Conceptual Planting Plan (Office of Dan Kiley 1964).

### Processional Walks

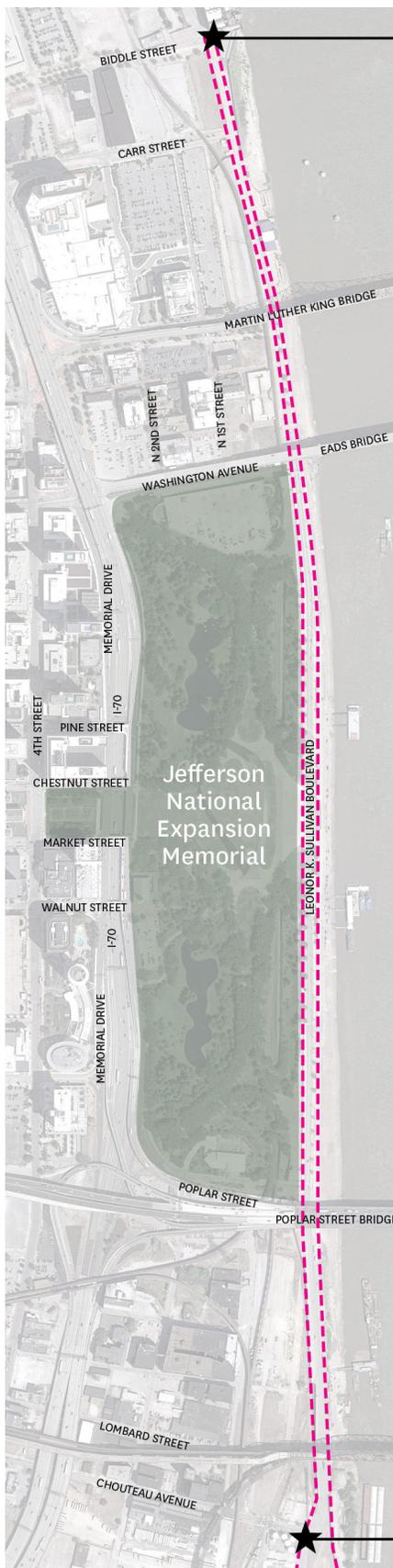
NPS would replace the existing ash trees with a more suitable species, as discussed under the planting strategy, while utilizing this replanting process as an opportunity to

repair and amend the conditions underneath the walks. To accomplish this, NPS would incorporate new structural soil and repair or replace existing drainage and irrigation systems. Alternatives 2 and 3 would allow for the replacement in-kind of the exposed aggregate concrete surface of the walks throughout the Processional Walks and adjacent connections to the overlooks. Where appropriate and if feasible, a cobble border and tree pit treatment, similar to the Kiley design, would be considered during the design process. These changes may require some retrenching of path edge utility lines (water and electric) as well as reconfiguration of stormwater runoff drainage connections to existing combined sewers.

### Old Courthouse

Alternatives 2 and 3 would renovate galleries and install new exhibits within the first and second floors of the Old Courthouse. Accessibility would be improved at both the exterior and interior of the building, as described under the accessibility strategy. In the interior spaces, mechanical, electrical, or alarm systems would be upgraded or replaced as necessary. The surrounding streetscape would be improved to accommodate concurrent, proposed changes to adjacent city streets as well as improve accessibility at pedestrian crossings.

These improvements would include widening sidewalks along Market and Chestnut Streets, as well as the installation of new curb cuts. The sidewalks on the north side of Market Street and on the south side of Chestnut Street would be widened to provide a stronger physical and visual connection from Citygarden to the Arch grounds. Street trees would not be planted around the Old Courthouse in accordance with the historic streetscape that has existed around the perimeter of the building. The sidewalk improvements would also include accessibility improvements to the Market and Chestnut Street corridors.



Biddle Street Trailhead

Chouteau Avenue Trailhead

Figure 10 Central Riverfront Project Area (Source: MVVA)

The sidewalk widening along Market Street adjacent to the park would be possible with the removal of an extra turn lane that exists between North Broadway and North 4th Street, where the sidewalk width would increase by approximately 10'. The sidewalk modification to the north side of Chestnut Street would be possible due to an existing travel lane that is 15' wide. The travel lane would be reduced to a more typical 10' width, allowing the sidewalk to increase in width by 5' to the north. Modifications of sidewalk widths around the Old Courthouse would be relatively minimal, as the existing block is already wider than other blocks along Market and Chestnut Streets. The proposed curb alignments would align to the proposed limits at Kiener Plaza and at Luther Ely Smith Square.

### The Central Riverfront

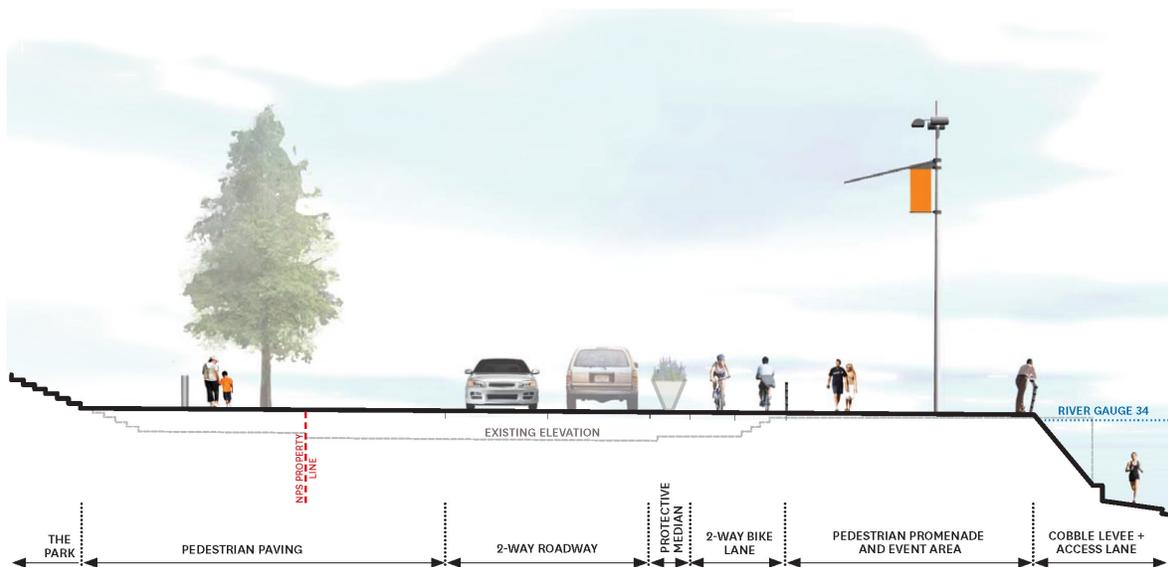
Alternatives 2 and 3 would transform the Central Riverfront from Chouteau Avenue to Biddle Street by raising the elevation of Leonor K Sullivan Boulevard an average of 2.9 feet across the project site, varying between one foot and 4.5 feet, to reduce the frequency and impact of flood events. Elevation changes to Leonor K. Sullivan Boulevard would be subject to additional design review requirements and Section 106 compliance to ensure the potential for adverse effects under Section 106 is and impacts to the park's

NHL District, Eads Bridge, and other historic buildings, structures, sites, objects, and districts and cultural landscapes are minimized.

A new multi-modal roadway would be established, providing a critical link in the regional system of bike trails, in this case between the bike trails and areas north and south of the Arch grounds. The proposed improvements would convert the existing two-lane roadway section with periodic left turn lanes into a narrower two-lane roadway section with a two-way bike path separated from the vehicle travel lanes and could include designated areas for bus drop-off/pick-up lanes (Figures 10 and 11).

A new pedestrian promenade would be created between the bike path and the historic cobble levee and would feature new street trees, street lighting, access to the historic cobble levee, and a central area for river viewing and programmed events. Existing sidewalk paving along the east side of the park would be replaced with exposed aggregate concrete to match existing paving. Traffic calming measures include raised pedestrian crossings at the base of the Grand Staircase and at the new crosswalk locations at the base of the East Slope paths. Flush curbs and/or accessible curb ramps would be provided at all new crosswalks.

Figure 11 Central Riverfront Leonor K. Sullivan Concept Section (Source: MVVA)



## ALTERNATIVE 2: MODERATE CHANGE

This alternative provides improved connections between the park and the city, meeting the goals of the park’s General Management Plan (NPS 2009). A key feature of the alternative includes a new landscape across the Park Over the Highway, which would connect a redesigned and expanded Luther Ely Smith Square to the western entrance to the park (Figure 12).

### PARKWIDE STRATEGIES

#### Security

A continuous perimeter of vehicle ram barrier walls and bollards would provide security (Figure 13). Alternative 2 would maintain the existing security perimeter of bollards tying into the north facade of the existing Arch Parking Garage. Other bollards throughout the park would remain or be replaced in kind. The ranger station would remain in its current location within the Arch Parking Garage. Security screening for the Visitor Center/ Museum would remain in place at each of the Arch legs. Visitor security screening would remain in place at the Arch legs. The proposed new accessibility ramps at the Arch leg entrances would not alter these functions.

#### Topography/Grading

Luther Ely Smith Square would be re-graded to provide a large plaza at its western edge that slopes gently downward to the confluence of the extensions of the Processional Walks. Moving east, visitors would enter the lawn at its western edge, approaching a small rise before coming to a shallow valley that descends to the base of the Arch. The paths on either side of the lawn would be lower than the lawn, with planted slopes on both sides of the pathways that shield pedestrians from the noise and pollution of I-70. These paths would transition to meet with existing Processional Walks, creating an accessible link to the Arch. In order to make the connections to the Processional Walks from the West Gateway

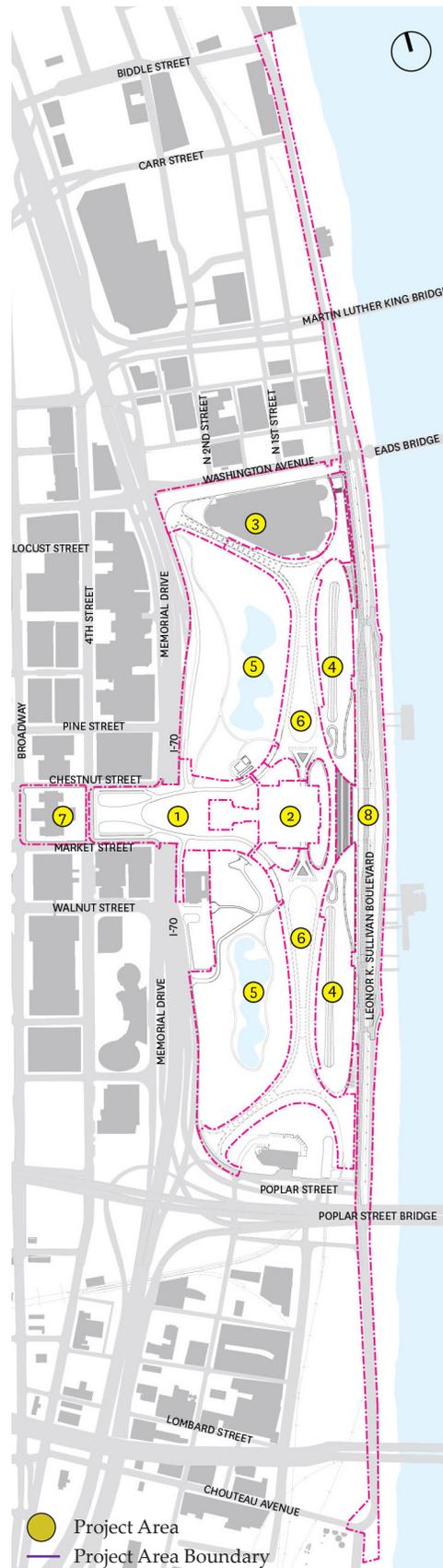


Figure 12 Alternative 2 Site Plan  
(Source: MVVA)

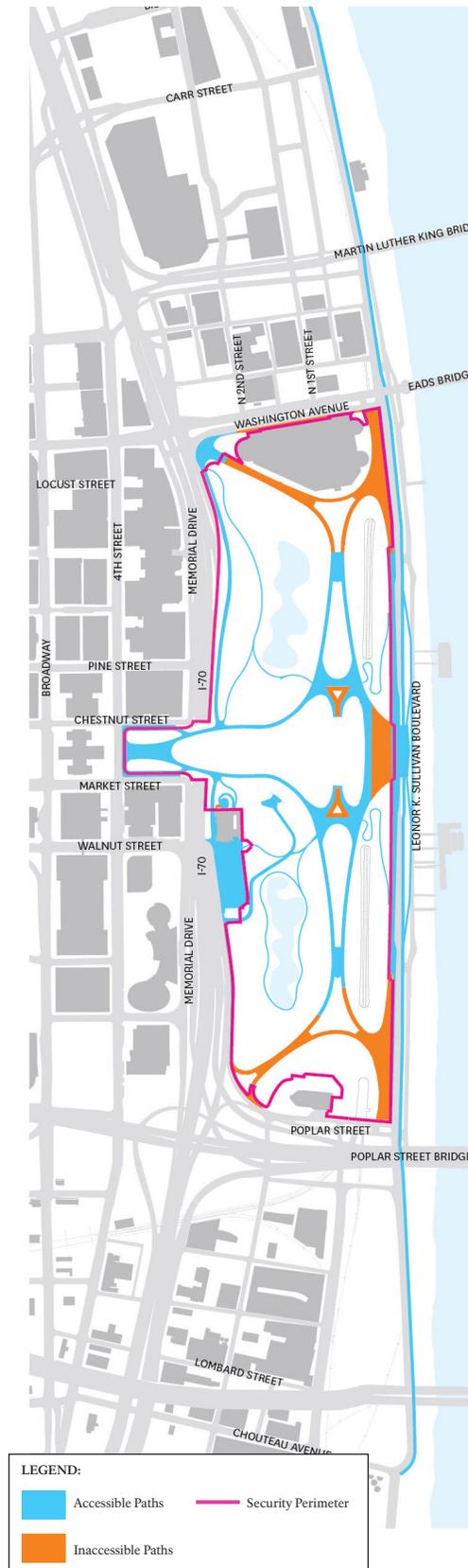


Figure 13 Alternative 2 Proposed Security and Accessible Routes (Source: MVVA)

accessible, portions of the walks would be rebuilt at a lower elevation than currently exists. Roadway clearance requirements over the interstate and structural requirements would dictate the elevation of the surface of the Park Over the Highway structure to be constructed by MoDOT. Any changes to the existing berm and the lawn area underneath the Arch would be subject to additional design review requirements and Section 106 compliance to ensure impacts to the cultural landscape and National Historic Landmark are minimized.

Slight re-grading of the northwest corner of the park (in the North Gateway) would occur in order to achieve an accessible connection into the park at the intersection of Washington Avenue and Memorial Drive. This would require minimal modifications to the existing topography and could likely be achieved without importing or exporting fill material. Due to the substantial removal of fill at the existing West Gateway berm, it is expected that there would be a surplus of fill that would need to be removed from the site. A protocol for fill material would be developed during the detailed design process to ensure re-used fill does not contain artifacts and is culturally sterile.

### Accessibility

Under alternative 2, visitors with disabilities accessing the park from the North Gateway would be directed to use existing elevator facilities within the Arch Parking Garage. Figure 13 shows which park paths and circulation routes would be accessible under alternative 2.

### Planting

Plantings lining the paths from Luther Ely Smith Square and crossing over the depressed highway would be comprised of shrubs that would not grow high enough to interfere with the Saarinen vista. Canopy trees would be planted along the gentle berms at the exterior edges of the long lawn that would run

at a lower elevation over the Park Over the Highway and create a pair of densely planted passages. There would be limited opportunities for planting at the North Gateway, with the majority of new plantings limited to the northwest intersection, planting at or on the structure of the garage as feasible, and planting of the streetscape adjacent to the garage. Proposed plantings for alternative 2 are shown in Figure 14.

### Parking

The Arch Parking Garage would remain under alternative 2. Therefore, visitors and employees would be provided with a dedicated parking facility on park grounds for the remaining lifespan of the structure. Bus, RV, and oversize vehicle parking would continue to be accommodated along South Leonor K. Sullivan Boulevard/South Wharf Street south of the Poplar Street Bridge.

### PROJECT AREAS

#### West Gateway

Alternative 2 proposes that the West Gateway serve as a major point of arrival for visitors to the park (Figure 15). It would provide outdoor spaces for group orientation and gathering and spaces for individual rest and relaxation. The West Gateway would act as both a conceptual and literal bridge between the park, the Old Courthouse and downtown St. Louis at an expanded Luther Ely Smith Square from North 4th Street to the existing western approach to the Arch. An agreement between MoDOT and the NPS would enable the creation of a structure built over the depressed section of I-70. While the structure itself would be constructed, owned and maintained by MoDOT, the surface would be managed and maintained by the NPS, in order to create a continuous landscape connection - a Park Over the Highway. Further description of the structure over I-70 that would be constructed by MoDOT is located in the Cumulative Impacts section of this EA.

Some visitors would arrive at Luther Ely Smith Square, with car and bus drop-offs flanking its north and south sides. Others would walk into the park from the Arch Parking Garage



Figure 14 Alternative 2 Proposed Plantings (Source: MVVA)

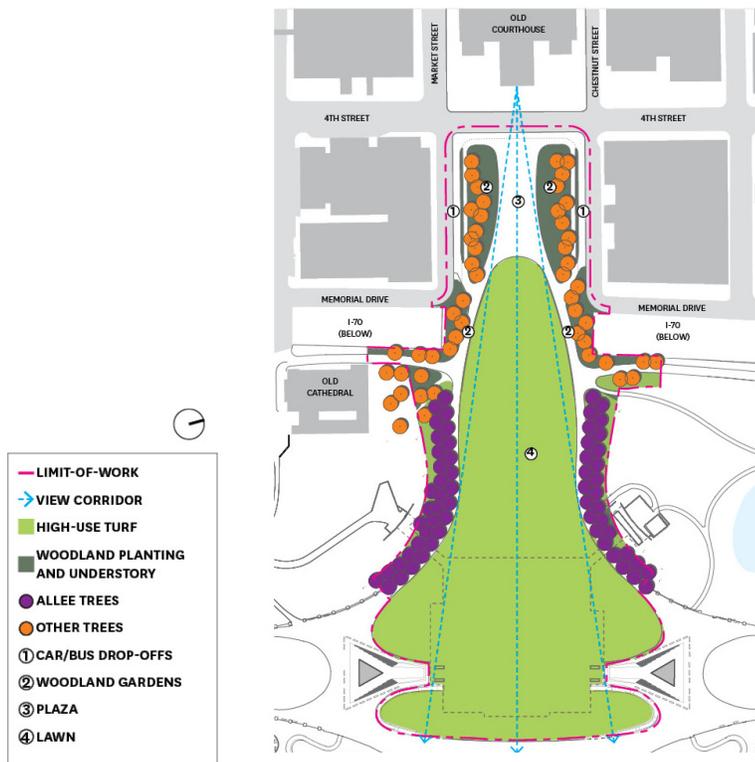


Figure 15 Alternative 2 West Gateway  
(Source: MVVA)

and from downtown businesses, attractions, and parking structures. Traffic around Luther Ely Smith Square would flow in a clockwise direction. Woodland shade gardens would separate these drop-offs from a large plaza leading down to a large east to west oriented sloping lawn, which would transition into the existing park. The lawn would serve as an amphitheater for large events. Plantings lining the paths from Luther Ely Smith Square would be comprised of shrubs that would not grow high enough to interfere with the Saarinen vista. Gentle berms at the exterior edges of the long lawn would be flanked by canopy trees that would run at a lower elevation over the Park Over the Highway and create a pair of densely planted passages. These would shield visitors from views and noise associated with the Memorial Drive/I-70 corridor, and would provide a contrasting experience from walking the length of the larger lawn.

### Visitor Center/Museum

Alternative 2 would renovate existing exhibit space. New interior and exterior ramps would

supplement the existing ramps at the Arch legs and provide accessible entrance and egress routes for the Visitor Center/Museum. The interior ramps would be placed on top of the east sections of the existing split-ramps system. A passage would be created through existing interior walls leading to doors opening onto the exterior ramps via a new level platform at the location of the existing security screening area. The exterior ramps would follow the edge of existing pavement and terminate across from the Grand Staircase. A guardrail system would be installed at grade along the edges of the exterior ramps to protect visitors from falling into the depressed ramp. The guardrail would be designed to have as minimal a visual impact as possible. Due to their required length, the interior ramps would extend into the lobby, and would have benches for seating, in order to break up the length of the ramps for visitors. These changes would be subject to additional design review requirements and Section 106 compliance to ensure impacts to the cultural landscape and National Historic Landmark are minimized.

Visitor fees collected at the park would include the fee for the Ride to the Top of the Arch and to view the films screened in the theaters at the Visitor Center/Museum. Fees to access exhibits and programming in the Visitor Center and the Museum of Westward Expansion, to enter the Old Courthouse, or to enter the Arch grounds would not be collected.

### North Gateway

Under alternative 2, the existing Arch Parking Garage would remain. Aesthetic improvements to the garage could include painting, new plantings, such as vines over the façade, and new, updated signage (Figure 16).

Changes to the highway and street infrastructure introduced by MoDOT would alter access to the garage. In response to these changes, NPS proposes that Washington Avenue be closed between 1st Street and Memorial Drive (at the northwest intersection). Access to the Arch Parking Garage would be provided both through Laclede’s Landing as well as via a “slip-lane” at the proposed northbound exit off the interstate highway at Memorial Drive. With



Figure 16 Alternative 2 North Gateway  
(Source: MVVA)

the Washington Avenue ramps and intersection completed, the “slip-lane” would allow a single lane of traffic to turn right onto the eastbound only lane segment of Washington Avenue between Memorial Drive and North 1st Street, and proceed from there to the Arch Parking Garage or to Leonor K Sullivan Boulevard. An additional pedestrian crossing at the vehicular “slip-lane” from I-70 onto Washington Avenue would be required to facilitate pedestrian access from the Washington Avenue intersection into the park. City access to the Parking Garage would be from Washington Avenue, to North 3rd Street, to Laclede’s Landing Boulevard, to North 2nd Street and then to the Arch Parking Garage (see the Cumulative Impacts section of Chapter 4 for more details about the proposed changes to the street network). The graphic below is provided for illustrative purposes to show the proposed changes to the North Gateway and the location of the slip-lane and street network changes proposed by MoDOT and the City of St. Louis. As design work continues during the detailed design process, changes could occur.

With the increased elevation of Leonor K. Sullivan Boulevard at the Central Riverfront a new sloped transition would be required for the road and sidewalk surfaces from the west edge of Leonor K. Sullivan roadway to the existing surface of Washington Avenue below the Railroad trestle, between the North Overlook wall and Eads Bridge.

### CONSTRUCTION AND OPERATION COSTS

The net construction cost of this alternative would range between approximately \$75 million and \$100 million. Annual operating costs under this alternative would increase between \$800,000 and \$1 million. Identification of these costs does not guarantee NPS funding. Full project funding for both construction costs and annual operations and maintenance costs may not be available all at once and would require a phased approach; it would most likely be provided by partners, donations and other non-federal and federal sources. In addition, the project would be designated to receive 30% of the revenue generated by a proposed sales tax increase for the benefit of parks and trails throughout the region.

## ALTERNATIVE 3: MAXIMUM CHANGE

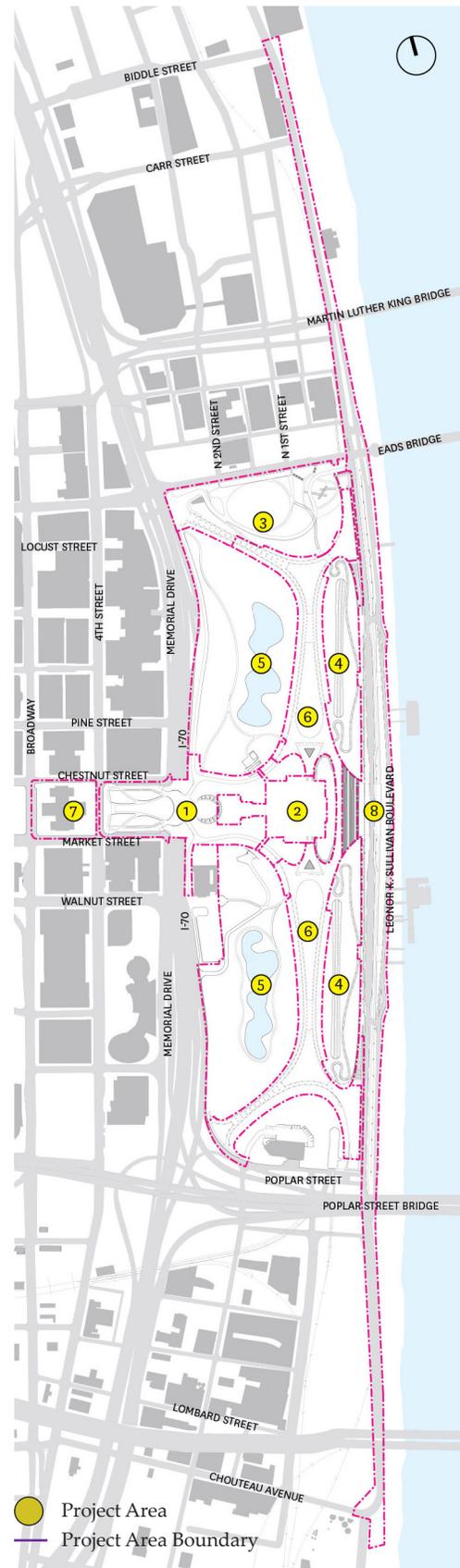
This alternative also provides extensive improved connections between the park and the city, meeting the goals of the park’s General Management Plan (NPS 2009). A key feature of this alternative would be a new entrance at the West Gateway to the park that would lead to an expanded underground Visitor Center/Museum. This entrance would connect to a redesigned and expanded Luther Ely Smith Square across the landscaped Park Over the Highway structure, forming a new primary entrance to the park. Another substantial feature of this alternative would be the removal of the existing Arch Parking Garage after the implementation of an alternative parking strategy, and its replacement with a new landscape which would include an Event space, Welcome Center, and Explorer’s Garden (Figure 17).

### PARKWIDE STRATEGIES

#### Security

A continuous perimeter of ram barrier walls and bollards would provide site security (Figure 18). Facing Memorial Drive, Market Street, Chestnut Street and North 4th Street, retaining walls integrated with the topography and plantings at the outer edges of the Woodland Shade Gardens would act as ram barrier walls and limit the presence of bollards to only those points where paths connect the park to the surrounding streets. Through much of the North Gateway, a shared pedestrian/bicycle path would be constructed after removal of the Arch Parking Garage. It would be lined on the south side with a retaining wall/ram barrier. At the east and west ends of the path, this would transition to a line of bollards which would complete the security perimeter at the North Overlook wall and west to the highway edge. A small new Welcome Center with the potential to include restrooms would be added in the North Gateway and park staff would greet and direct visitors to improve the sense of safety. This alternative would relocate the existing ranger station to the maintenance facility at the south end of the park.

Figure 17 Alternative 3 Site Plan (Source: MVVA)



Within the Visitor Center/Museum, visitors would be screened with airport-style metal detectors and x-ray machines. Intrusion detection systems would include alarms, detection devices, and video surveillance. These security functions would be located off the main lobby space of the new West Entrance, serving critical screening and security needs while not dominating the visitor experience. At the Arch legs' exit doors and new accessible exit ramps, security screening equipment would be removed. In this alternative the Arch legs would serve as exits only and therefore a single guard would be posted at each exit to monitor the exits and prevent unauthorized entry. Unintended entry by visitors to the Visitor Center/Museum would be further discouraged by signs, one-way ramp flow, and one-way outer doors. Guardrails would be placed atop the ramp walls to minimize fall hazards.

**Accessibility**

Alternative 3 would create multiple accessible pedestrian passages between the park, the Washington Avenue corridor, Laclede's Landing and the Mississippi riverfront. All four existing connections underneath the Eads Bridge between Laclede's Landing and the park would be made compliant for pedestrian accessibility, creating full access between the two downtown attractions. Replacing Washington Avenue with a shared pedestrian and bicycle pathway would provide a pedestrian accessible route from the city to the Central Riverfront. Smaller paths off this route would make connections between Laclede's Landing and the rest of the park. An elevated walk would make a connection over the bike path to create an accessible route from North 1st Street to the park. The intersection of Washington Avenue and Memorial Drive would become a four-way intersection with the closure of Washington Avenue to through traffic between Memorial Drive and Leonor K Sullivan Boulevard.

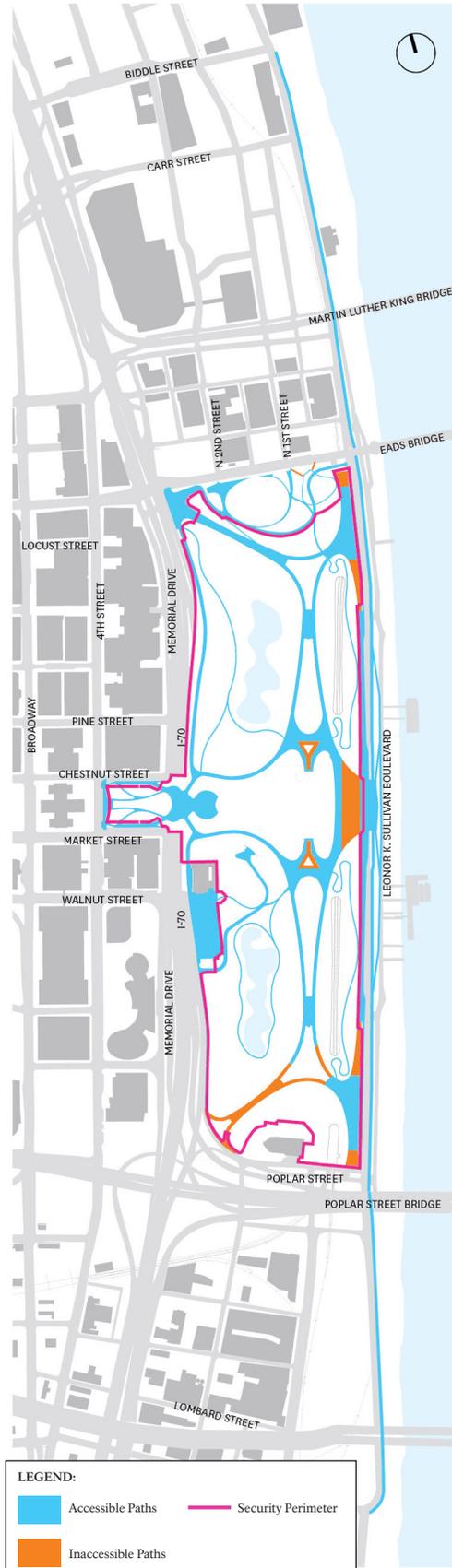


Figure 18 Alternative 3 Proposed Security and Accessible Routes (Source: MVVA)

The new West Entrance would provide an accessible entrance and exit for visitors. New interior and exterior ramps in the areas of the Arch legs, described further in the Visitor Center/Museum project area description, would provide additional accessible exits. The plaza leading to the West Entrance would slope at an accessible grade of no more than 5%. This would create a new arrival, visit, and departure sequence that would be fully accessible from the Old Courthouse through the West Gateway into the Visitor Center/Museum. Figure 18 depicts accessible park paths and circulation routes in alternative 3.

### Topography/Grading

Creating a new entrance to the Visitor Center/Museum would require modification of the topography of the berm that currently runs along the western edge of the park between the Old Cathedral and Washington Avenue. Roadway clearance requirements over the interstate and structural requirements would dictate the elevation of the surface of the Park Over the Highway structure. Accessibility requirements limit the degree of slope that the plaza can descend to the West Entrance of the Visitor Center/Museum to less than 5%. Additional constraints include programmatic, structural, mechanical and accessibility requirements

within the Visitor Center/Museum, which would require changes to the existing berm and the lawn area underneath the Arch. In order to make the connections to the Processional Walks from the West Gateway compliant with accessibility requirements, those portions of the walks demolished for construction of the West Entrance to the Visitor Center/Museum would be rebuilt at a lower elevation than currently exists. The topographical changes would be coordinated with the proposed west entrance to the Visitor Center/Museum. These changes would be subject to additional design review requirements and Section 106 compliance to ensure impacts to the cultural landscape and National Historic Landmark are minimized.

Demolition of the existing Arch Parking Garage would create a level surface of five acres approximately 25 feet below the existing elevation of the Processional Walks. Fill would be required to create a new landscape and path transitions between the park and the adjacent neighborhoods and amenities. The concrete structure of the existing garage could be crushed, re-used and/or recycled as appropriate to minimize the amount of fill needed. These topographic changes would create new vistas for visitors. From the park, eliminating the garage would open up views to the Eads Bridge (Figure 19). This would create a visual connection to

Figure 19 View of North Gateway and Eads Bridge (Source: MVVA)



and from Laclede's through the four portals underneath the Eads Bridge. Visitors arriving from the west via Washington Avenue would see an open view into the park and a partial view beneath the railroad trestle down to the Central Riverfront.

The central pathway through the North Gateway would slope down to the Central Riverfront, creating a long gentle valley (Figure 20). At the bottom, the Explorers Garden would include several shallow depressions that would create topographical variety for different planting types and also capture stormwater runoff. With the former Arch Parking Garage site as a depository, it is expected that most of the excavated fill from the new west entrance to the Visitor Center/Museum, the addition, and reflecting ponds landscapes could be retained on site. All excavated fill would be tested and determined if it is suitable for re-use. A protocol for fill material would be developed during the detailed design process to ensure re-used fill does not contain artifacts and is culturally sterile.

### Parking

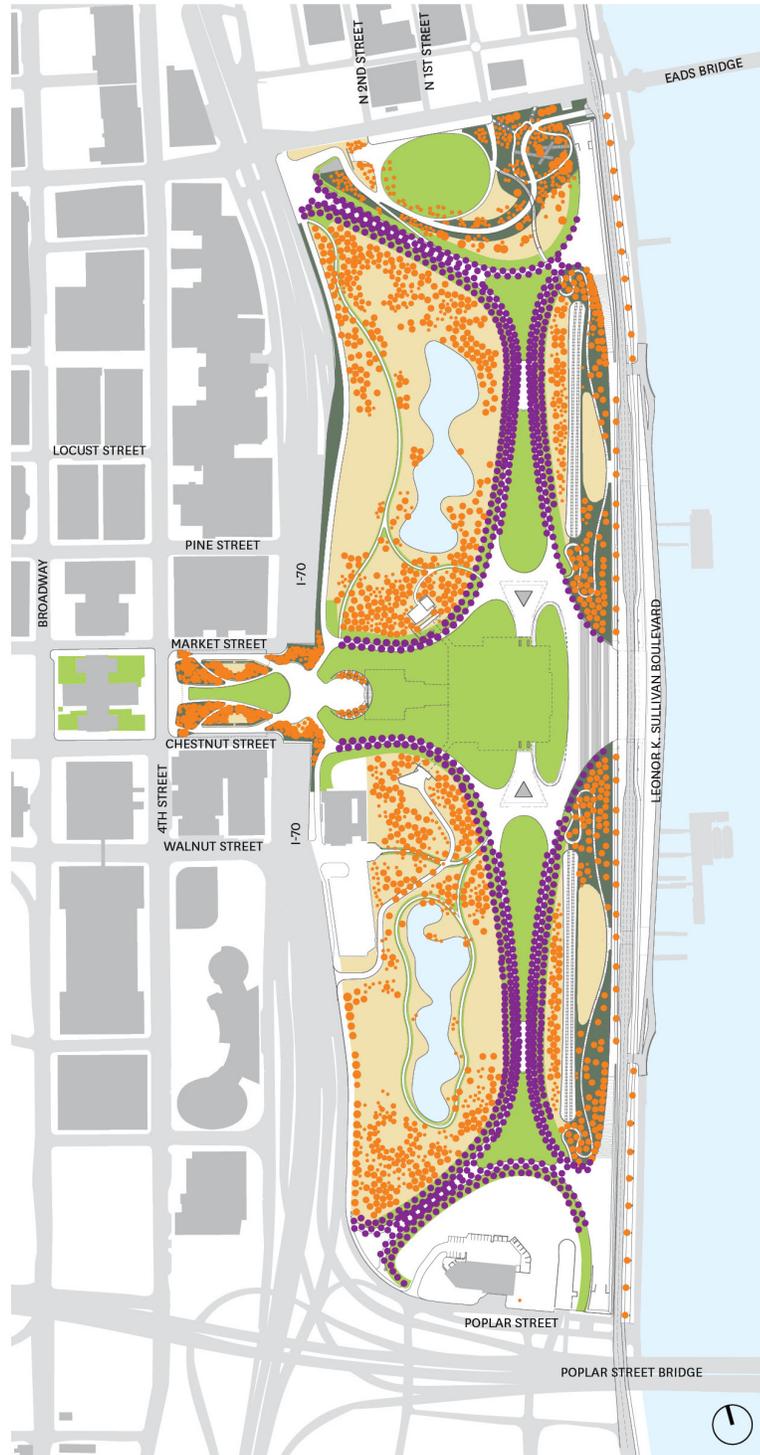
The removal of the existing Arch Parking Garage under alternative 3 would occur in a phased approach. The approach is dependent

on a first phase of planning by the City of St. Louis, the St. Louis Development Corporation (SLDC), Metro/BiState and NPS. A parking strategy would be implemented prior to demolition to facilitate access to nearby parking for visitors, park staff, and others accessing the park and adjacent downtown activities. This planning approach was identified in the Value Analysis workshop in July 2011.

The first step in this process, a parking study, was conducted to document existing conditions and to help determine what parking strategies could be implemented. These strategies could include improved visitor wayfinding, identifying other existing parking locations downtown, and evaluating the potential for new parking locations. Unless otherwise identified by the parking study, bus, RV, and oversize vehicle parking would continue to be accommodated along South Leonor K. Sullivan Boulevard/South Wharf Street south of the Poplar Street Bridge. The potential for a new garage, however, is too speculative at this time. For the purposes of this EA analysis, it is assumed existing, underutilized parking identified in the parking study would be available for park visitors (Carl Walker 2012). Once the parking strategy has been developed through this public-private

Figure 20 View of North Gateway and Eads Bridge (Source: MVVA)





partnership process and implemented, the demolition of the garage and installation of landscape improvements could proceed.

The relationship to changes in the overall transportation network of the St. Louis metro area was shown to be a major factor in the function and value of the existing garage structure. With larger transportation changes taking effect (see the Cumulative Impacts section in chapter 4), convenient, safe, accessible, and attractive parking for visitors both to the city and the park would continue to be required. Programmatic coordination with local agencies on collaborative parking and/or way finding strategies would be encouraged in order to make use of the garage as transportation changes unfold. New highway and street signage would be installed with the roadway changes proposed by MoDOT and would include directional signage to the Arch and associated parking to aid park visitors. SLDC is also developing a local city streets signage program that would take into account the needs of park visitors.

### Planting

Plantings directly in front of the West Entrance to the Visitor Center/Museum would be comprised of shrubs and small trees that would not grow higher than the berm or interfere with the Saarinen vista.

The North Gateway slopes and valley between the park and the Eads Bridge would be a conservation mown area with scattered trees, which would preserve views into the park. A large lawn of high-use turf intended to withstand heavy use would be constructed. An “Explorers” garden would feature woodland plantings that serve as educational tools, such

Figure 21 Alternative 3 Proposed Plantings (Source: MVVA)

as illustrating the botanical aspects of Lewis and Clark’s journey. Plantings proposed for alternative 3 are shown in Figure 21.

## PROJECT AREAS

### West Gateway

Alternative 3 proposes that the West Gateway serve as a major point of arrival for visitors to the park (Figure 22). It would provide outdoor spaces for group orientation and gathering, and spaces for individual rest and relaxation. The West Gateway would expand Luther Ely Smith Square from North 4th Street to the new West Entrance and would act as both a conceptual and literal bridge between the park grounds, the Old Courthouse, and downtown St. Louis. An agreement between MoDOT and the NPS would enable the creation of a structure over the depressed section of I-70. While the structure itself would be constructed and maintained by MoDOT, the surface of the structure would be available to and managed by the NPS to create a continuous physical connection - a Park Over the Highway. Further description of the structure over I-70 that would be constructed by MoDOT is located in the Cumulative Impacts section of this EA.

Some visitors travelling to the park by car or bus would arrive at drop-offs along the north and south sides of Luther Ely Smith Square. Others would walk into the park from downtown businesses, attractions and parking structures, and would be greeted with generous sidewalk gathering spaces with long rows of benches shaded by trees. Entering from North 4th Street, visitors would first encounter a small plaza, introducing the historic Saarinen vista between the Arch and the Old Courthouse. Paths flanking a central lawn would lead visitors east to the plaza. The plaza would serve both as a formal entrance into the park and a visible connection to the proposed West Entrance to the Visitor Center/Museum. Visitors could also choose paths leading north or south into the park.

The plaza area in front of the West Entrance to the Visitor Center/Museum would also provide shade gardens and seating at its edges to ensure it is a comfortable space for all. It would be sized to accommodate large groups

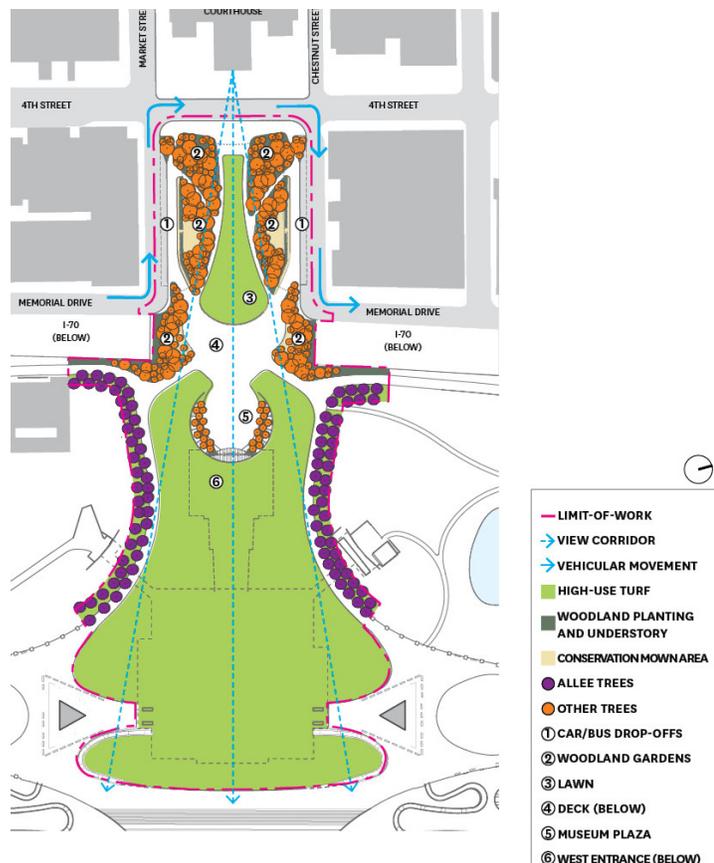
which could gather prior to entering the Visitor Center/Museum.

Outside the viewshed of the Saarinen vista, along Chestnut and Market Streets, and the edges of the structure built over I-70, plantings of canopy trees, shrubs and groundcover would be utilized to create densely planted shade gardens. These would shield visitors from vehicular noise and pollution, while providing comfortable spaces for relaxation.

### Visitor Center/Museum

Under alternative 3, existing spaces in the Visitor Center/Museum beneath the Gateway Arch would be selectively renovated and an additional 35,000-50,000 square feet of space, depending on design development, is proposed, including visitor orientation, museum exhibit, and education space. The new addition would include a plaza and ground-level entry to the Visitor Center/

Figure 22 Alternative 3 West Gateway (Source: MVVA)



Museum complex beneath the Gateway Arch. The new West Entrance would be embedded within the existing berm landform. A glass façade would frame a direct visual connection to the Old Courthouse and this light-filled lobby would serve as the entrance to both the exhibits and the Arch. It would also serve as the Visitor Center for the park. The new lobby at the entrance would be large enough for visitors to assemble and orient themselves before moving into the Museum of Westward Expansion's exhibition spaces. An entrance fee for the Visitor Center/Museum, as well as any other fees for visitor experiences such as the Ride to the Top of the Arch, would be collected at ticket stations in the new lobby. A fee structure would be determined during the detailed design process. Free access to the Arch grounds and the Old Courthouse would continue.

New exhibits, casework, and lighting would be provided throughout. Ticketing, restrooms, and security would be relocated into the new entry. Within the expansion and existing visitor center and museum area, alternative 3 would rearrange circulation, exhibit, administrative/support, and store spaces. The expansion in alternative 3 would require new utility connections and adjustments to existing utilities such as water, steam, and telecommunication lines.

Alternative 3 would provide an accessible egress route out of the Visitor Center/Museum near the Arch legs with new interior and exterior ramps to supplement the existing ramps at the Arch legs. The interior ramps would be placed on top of the east sections of the existing split-ramps system. A passage would be created through existing interior walls leading to doors opening onto the exterior ramps via a new level platform at the location of the existing security screening area.

The exterior ramps would follow the edge of existing pavement and terminate across from the Grand Staircase. A guardrail system would be installed at grade along the edges of the exterior ramps to protect visitors from falling into the depressed ramp. The guardrail would be designed to have as minimal a visual impact as possible. Due to their required length,

the interior ramps would extend into the lobby, and would have benches for seating, in order to break up the length of the ramps for visitors.

These changes would be subject to additional design review requirements and Section 106 compliance to ensure impacts to the cultural landscape and National Historic Landmark are minimized.

The doors at the Arch legs ramps would no longer be entrances, and would be modified to serve as exits only. As such, a single guard would be posted at each exit to monitor the exits and prevent unauthorized entry. Unintended entry by visitors to the Visitor Center/Museum would be further discouraged by signs, one-way ramp flow, and one-way outer doors. Guardrails would be placed atop the ramp walls to minimize fall hazards.

### **North Gateway**

Alternative 3 proposes to remove the existing Arch Parking Garage and replace it with a new landscape that would take advantage of local adjacencies to the Laclede's Landing neighborhood to the north and the Washington Avenue/Convention Center corridor to the west (Figure 23). Washington Avenue would be closed to through traffic and a drop-off area would be established. The Arch Parking Garage would be removed after the implementation of an alternative parking strategy. New programs in the North Gateway would include a large Orientation/Event Lawn, a Welcome Center and a heritage-themed Explorers Garden for children. Additionally, a shared pedestrian/bicycle path would create an accessible link between the park, the city, and the Central Riverfront. Should removal of the garage be delayed for any period of time, the proposed increase in elevation of Leonor K. Sullivan Boulevard at the Central Riverfront may require a new sloped transition for the road and sidewalk surfaces from the west edge of Leonor K. Sullivan roadway to the existing surface of Washington Avenue below the Railroad trestle between the North Overlook wall and Eads Bridge. The removal of the Arch Parking Garage would necessitate the



Figure 23 Alternative 3 North Gateway (Source: MVVA)

resetting of underground electrical, water mains, and tie-ins to existing combined sewer infrastructure.

### CONSTRUCTION AND OPERATION COSTS

The net construction cost of this alternative would range between approximately \$180 million and \$250 million. Annual operating costs under this alternative would increase between \$2 million and \$3 million. Identification of these costs does not guarantee NPS funding. Full project funding for both construction costs and annual operations and maintenance costs may not be available all at once and would require a phased approach; it would most likely be provided by partners, donations and other non-federal and federal sources. In addition, the project would be designated to receive 30% of the revenue generated by a proposed sales tax increase for the benefit of parks and trails throughout the region.

<span style="color: magenta;">—</span>	LIMIT-OF-WORK
<span style="background-color: #90EE90; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	HIGH-USE TURF
<span style="background-color: #668080; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	WOODLAND PLANTING AND UNDERSTORY
<span style="background-color: #F5F5DC; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	CONSERVATION MOWN AREA
<span style="color: yellow;">●</span>	ALLEE TREES
<span style="color: green;">●</span>	OTHER TREES
①	NORTH LAWN
②	EXPLORERS GARDEN
③	ELEVATED WALK
④	WELCOME CENTER
⑤	DROP-OFF
⑥	PEDESTRIAN/BIKE PATH

## MITIGATION MEASURES

The NPS places a strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts. Under any of the action alternatives, best management practices and mitigation measures would be used to prevent or minimize potential adverse effects associated with the project. These practices and measures would be incorporated into the project construction documents and plans. To help ensure the protection of cultural resources, natural resources, and the quality of the visitor experience, the following protective measures would be implemented.

### GENERAL CONSTRUCTION MITIGATION MEASURES

The NPS would implement an appropriate level of monitoring throughout the construction process to help ensure that protective measures are being properly implemented and to achieve their intended results. The NPS would ensure the implementation of the measures outlined in the programmatic agreement (PA) to assess and resolve adverse effects to historic buildings, structures, sites, objects, districts and landscapes. The PA includes the establishment of a Collaborative Design Review Team to review draft schematic and design documents, evaluate how projects may affect resources within the Section 106 Area of Potential Effects, and make recommendations to avoid any adverse effects. The PA is included in Appendix D of this environmental assessment.

Construction and staging for construction would be coordinated with other ongoing construction efforts led by NPS and other entities, as well as with seasonal constraints and adjacent property owners as necessary. Staging for selective excavation and material delivery would need to be coordinated to keep visitor disruptions to a minimum. Construction would also be coordinated and timed to minimize disruptions to visitors and accessibility around the park.

Existing structures and newly completed construction would be protected from ongoing construction activity. Standard required

construction site fencing, temporary security measures, and museum security would be provided throughout duration of the work in the park. As the construction phases are completed, care would be taken to make areas accessible to visitors where possible, while ensuring that the new construction is adequately protected and maintained for the final use and occupancy.

Construction on the park site and the Central Riverfront in all action alternatives would require the relocation of some utilities. Care would be taken to comply with all permitting and approvals required and to minimize horizontal movement, unnecessary disruption, and costs, and to avoid impacts to historic features. The West Gateway's new structure and landscape over the highway would require utility reconfiguration, including an existing steam pipe in the Market Street Bridge (to be coordinated with MoDOT), a water main, underground electrical lines, and possibly cable and telecom conduits. Coordination would occur with appropriate agencies and utility providers to maintain service during construction and during the installation of any new connections. New utilities required to serve proposed project elements and for construction would be designed and installed to mitigate impacts to the historic landscape and to comply with all applicable codes.

### ARCHEOLOGY MITIGATION MEASURES

In accordance with the PA developed during the Section 106 process, prior to any ground disturbing activities, all locations that may be impacted by these activities would be tested and evaluated for potential to contribute archeological information. The NPS would consult with the Missouri State Historic Preservation Officer (SHPO) and the Osage Nation regarding any necessary archeological surveys to determine if any such archeological sites are present and whether such sites are eligible for the National Register. A protocol for fill material would be developed during the detailed design process to ensure re-used fill does not contain artifacts and is culturally sterile. Should unanticipated archeological resources be discovered during construction, all work in the immediate vicinity of the discovery would stop immediately and the

proper authorities would be notified. Work would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed. Discovered resources would be evaluated for their potential NRHP significance, and, if needed, mitigation measures would be developed in consultation with the Missouri SHPO and appropriate representatives of affected tribes. The NPS would conduct identification and assessment of archeological resources consistent with the measures described in the PA, which is included in Appendix D of this EA.

In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act, as amended (43 CFR 10, Subpart B) and the Archeological Resources Protection Act of 1979 (43 CFR 7) would be followed. Appendix D of the PA includes further stipulations that would be followed.

Mitigation measures would be cognizant of resource significance and preservation needs, and could include such provisions as changes in project design and/or archeological monitoring of the project and data recovery conducted by an archeologist meeting the Secretary of the Interior's standards. NPS would ensure that the measures outlined in the PA are carried out to avoid, minimize, and mitigate adverse effects.

## **MITIGATION MEASURES BY PROJECT AREA**

### **East Slopes**

For concrete and grading work at the base of the East Slopes, attempts would be made to time construction so as to avoid the usual seasonal high water condition on the Mississippi River. Work would be coordinated with concurrent work throughout the park and with the work on the Central Riverfront, specifically at the edges of the project areas where the East Slopes meet the allées at the head of the slopes and the NPS property boundary near the toes of the slopes. Construction activities would be coordinated to minimize interference with

current train or riverfront business operations wherever possible. Utility connections would be necessary along the length of the paths in order to power the new path lighting and drain stormwater. The path treatment and materials would be compatible with the historic landscape. Existing trees would be retained when possible and would be protected during construction to minimize disruptions to vegetation and soil.

### **Reflecting Ponds**

Construction would need to be coordinated with MoDOT's work at the former Memorial Drive northbound area between Chestnut Street and the Washington Avenue intersection. Work around the Walnut Street area would be coordinated with adjacent property owners, including MoDOT and the Archdiocese of St. Louis. Work would also be coordinated with the design and construction of the Processional Walks. The Reflecting Ponds work may require some retrenching of path edge utility lines (water and electric) as well as reconfiguration of stormwater drainage connections to existing combined sewers. The path treatment and materials would be compatible with the historic landscape.

### **Processional Walks**

During phased removal of the existing ash trees, work would proceed on renovating the pavement of the walks, including associated soil amendments and irrigation improvements, to coordinate construction and limit disruptions to the area. The Processional Walks work may require some retrenching of path edge utility lines (water and electric) as well as reconfiguration of stormwater runoff drainage connections to existing combined sewers.

### **Visitor Center/Museum**

Renovations to the lobby, Visitor Center, and exhibits would be staged so as to maintain visitor flow and allow security screening during construction. The infill platform and interior ramps needed to make the Arch legs an accessible entrance/exit would be designed so as to be constructed off-site and installed during normal closing times. The exterior

ramps would be constructed with minimal interior disturbance, and then connected through service spaces in off-peak season, when an Arch leg Visitor Center/Museum entrance might be able to be temporarily closed. With the construction of the new pedestrian ramps at the Arch legs, substantial consideration would be given to protecting the Visitor Center/Museum's material fabric, preserving the visual appearance of the Arch leg entry, and respecting Kiley walkways. The interior ramps and steps would be constructed as light-weight infill platforms so that damage to the building is minimized should they need to be removed.

The accessible ramp routing would require the demolition of Visitor Center/Museum interior walls, alterations to existing stairwells, relocation of utilities, reconfiguration of administrative space, and a punch-through of the Visitor Center/Museum exterior wall. These alterations would all take place outside the primary visitor area in adjacent service spaces. The exterior ramps would require retaining walls and guardrails to prevent falls. The existing edge of pavement would be tapered into the ramp so as to minimize visual discontinuity.

### **Old Courthouse**

Substantial consideration would be given to protecting the Old Courthouse's material fabric, preserving its historic integrity, and respecting the cultural landscape. Exterior ramps would be constructed so that damage to the building would be minimized should they need to be removed. The existing pedestal, sundial, and fountain on the east side of the Old Courthouse and the statue of Dred and Harriet Scott on the southeast side of the Old Courthouse would be protected and preserved. To mitigate visual impacts on the Old Courthouse exterior, the accessible ramps on the exterior of the building would use light-weight steel construction. Existing soil surrounding the building would be cleared, grubbed, and stockpiled to be replaced and reseeded with high use turf and augmented with additional planting soil as required. Construction work on the adjacent streets and sidewalks on Chestnut and Market Streets would be coordinated with the city and would

be staged and implemented to comply with city permit and construction requirements and to minimize impacts to visitor experience.

Accessibility improvements, exhibit space renovations, and detailed designs would be sensitive to the historic fabric of the building. In the interior spaces, mechanical, electrical, or alarm systems would be upgraded or replaced as necessary. These interventions would be subject to Section 106 compliance and would be accomplished according to the Secretary of the Interior's Standards (NPS 1995).

### **The Central Riverfront**

Construction would be coordinated and timed to minimize disruptions to visitors and riverfront businesses. Existing structures and newly completed construction would be protected from ongoing construction activity. Standard required construction site fencing, temporary security measures, and temporary traffic control devices would be provided throughout the duration of work on the Central Riverfront. Access to the riverfront and levee by emergency vehicles would be maintained at all times.

Raising the elevation of Leonor K. Sullivan Boulevard would require the placement of fill at the bottom of the Grand Staircase and the overlook steps, covering 4 or 5 of the Grand Staircase treads and 2 or 3 of the overlooks treads. The existing stair treads and foundations would be left intact and be buried. The stair treads would be covered with protective barriers to prevent damage during placement and compaction of fill. The sloping bases of the overlook walls would also be left intact and the surfaces would be protected by protective barriers before burying to the depth of the new elevation. Modifications to stair handrails would be in-kind with the existing handrails.

Raising the elevation of Leonor K. Sullivan Boulevard would require the placement of fill at the base of Eads Bridge. Efforts would need to be made to protect the Eads Bridge, including documentation of existing conditions, protective barriers, seismic monitoring and the monitoring of documented existing damaged and compromised elements

during construction. Particular care would be taken along the base of the bridge. Protective barriers would be placed against all masonry faces prior to placement and compaction of fill. The new elevation of the Leonor K. Sullivan roadway surface in the area of the Eads Bridge would be such that limited exposure of the existing red granite at the base of the pier would be maintained.

Elevation changes to Leonor K. Sullivan Boulevard would be subject to additional design review requirements and Section 106 compliance to ensure the potential for adverse effects under Section 106 and impacts to the park's NHL District, Eads Bridge, and other historic buildings, structures, sites, objects, and districts and cultural landscapes are minimized.

Construction of the bicycle and pedestrian promenade improvements along the east side of Leonor K. Sullivan Boulevard would require some disturbance to the cobblestones along the levee. Cobbles along the eastern edge of the project would be salvaged and reset in order to maintain the integrity of the cobble levee.

## **ALTERNATIVE 2 – CONSTRUCTION MITIGATION**

### **West Gateway**

Construction would be coordinated with that of the adjacent projects at the park and MoDOT work on the Memorial Drive/I-70 corridor. Staging areas for construction materials would be identified. Upon completion of MoDOT's construction of the Park Over the Highway structure over I-70 and associated retaining walls, NPS would have access to the structure, and construction of the Luther Ely Smith Square new landscape and the Park Over the Highway landscape could commence. Changes to the West Gateway would be subject to additional design review requirements and Section 106 compliance to ensure impacts to the cultural landscape and National Historic Landmark are minimized.

## **ALTERNATIVE 3 – CONSTRUCTION MITIGATION**

### **West Gateway**

Construction would rely on extensive coordination with the construction of the Visitor Center/Museum and the structure over the I-70/I-44 corridor that would be constructed by MoDOT. Staging areas for construction materials would be identified. Upon completion, NPS would have access to the Park Over the Highway structure and construction at Luther Ely Smith Square, the Park Over the Highway landscape, and the West Entrance of the Visitor Center/Museum could commence.

Restoration of the berm and walks would require substantial completion of the West Entrance of the Visitor Center/Museum, including interior elements requiring good access to the Visitor Center/Museum interior. As construction is completed, construction access would be limited to protect existing and newly constructed facilities. The last pieces to be constructed would be the plaza and the landscape across the Park Over the Highway, as the needs for construction access and staging would be substantially reduced by this point in construction. Changes to the West Gateway would be subject to additional design review requirements and Section 106 compliance to ensure impacts to the cultural landscape and National Historic Landmark are minimized.

### **Visitor Center/Museum**

The Visitor Center/Museum expansion in alternative 3 would require new utility connections and adjustments to existing utilities such as water, steam, and telecom lines. This work would be done per the general construction mitigation practices described above.

Staging for selective excavation and material delivery would need to be coordinated to keep visitor disruptions to a minimum. As the construction phases are completed, care

would be taken to make areas accessible to visitors where possible, while ensuring that the new construction is adequately protected and maintained for the final use and occupancy. Visitor security screening would be accommodated during construction.

### **North Gateway**

A parking strategy would be implemented prior to demolition of the Arch Parking Garage to facilitate access to nearby parking for visitors, park staff, and others accessing the park and adjacent downtown activities. Discovery of asbestos and lead paint during demolition of the Arch Parking Garage or other renovations are not anticipated; however, testing for asbestos and lead paint would be performed prior to demolition. Any other hazardous materials, such as those associated with mechanical systems, would be removed from the garage prior to demolition.

Garage demolition would occur in a controlled manner as the parking garage is constructed with concrete blocks that are reinforced with high-strength steel strands that are pulled tight to actively reinforce the building (known as post-tensioning). The exact demolition methods that would be used would be determined as part of a demolition plan to ensure safe and efficient demolition. If possible, portions of the structure would be salvaged for re-use and metal would be recycled.

Efforts would need to be made to protect the Eads Bridge, including documentation of existing conditions, protective barriers, seismic monitoring and the monitoring of documented existing damaged and compromised elements during construction. Particular care would be taken along the base of the bridge where manipulation of grade may be required. Repair of previously buried walls would also need to be performed along the western face of the North Overlook as the proposed grade would be lower than existing conditions, exposing previously buried portions of the overlook.

## **HOW ALTERNATIVES MEET OBJECTIVES**

As stated in the “Purpose of and Need for Action” chapter, all action alternatives selected for analysis must meet all objectives to a large degree. The action alternatives must also address the stated purpose of taking action and resolve the need for action; therefore, the alternatives were individually assessed in light of how well they would meet the objectives for this plan/EA, which are stated in the “Purpose of and Need for Action” chapter. Table 1 compares the alternatives by summarizing the elements being considered. The section “How Alternatives Meet Project Objectives” discusses how the alternatives described in this chapter would meet the plan objectives. Alternatives that did not meet the objectives were not analyzed further (see the “Alternatives or Alternative Elements Considered but Rejected” section in this chapter).

The “Environmental Consequences” chapter describes the effects of each alternative on each impact topic, including the impact on cultural resources and visitor experience. These impacts are summarized in Table 2, “Summary of Environmental Consequences”.

Table 1 Summary of Alternatives

Project Area/ Alternative Element	Alternative 1: No-Action	Alternative 2: Moderate Change	Alternative 3: Maximum Change
West Gateway	<p>Access to the park from Luther Ely Smith Square would occur via the landscaped Park Over the Highway structure constructed by MoDOT and landscaped and maintained by NPS.</p>	<p>The West Gateway would serve as a major point of arrival for visitors to the park. At an expanded Luther Ely Smith Square, a large plaza leading down to a large east to west oriented sloping lawn, which would transition into the existing park. The lawn would serve as an amphitheater for large events.</p> <p>The surface of the Park Over the Highway structure that would be constructed by MoDOT connecting the Old Courthouse and downtown St. Louis with the park would be managed by the NPS to create a continuous landscaped connection. It would provide outdoor spaces for group orientation and gathering and spaces for individual rest and relaxation.</p> <p>From south to north, traffic around Luther Ely Smith Square would flow in a clockwise direction, with bus drop-offs on the north and south sides.</p>	<p>The West Gateway would serve as a major point of arrival for visitors to the park with a central lawn at an expanded Luther Ely Smith Square between the Old Courthouse and the new plaza and West Entrance to the Visitor Center/Museum.</p> <p>The central lawn would span across the Park Over the Highway structure that would be constructed by MoDOT to create a continuous landscaped connection.</p> <p>A new accessible Western Entry to the Visitor Center/Museum would be constructed and would include a plaza area in front of the entrance.</p> <p>From south to north, traffic around Luther Ely Smith Square would flow in a clockwise direction, with bus drop-offs on the north and south sides.</p>
Visitor Center/ Museum	<p>Museum exhibits would remain and interpretive and educational programs would continue within the current square footage of the museum.</p>	<p>The existing Visitor Center/ Museum exhibit space would be renovated and exhibits updated. Interpretive and educational programs would continue to be provided and updated.</p>	<p>The existing Visitor Center/ Museum space would be selectively renovated, exhibits updated, and an additional 35,000-50,000 square feet of space would be constructed for exhibits, storage, interpretive, and administrative functions.</p> <p>The new West Entrance would include a glass façade providing light to the lobby and a visual connection to the Old Courthouse. Ticketing, restrooms, and security would be relocated to the new lobby.</p> <p>Interpretive and educational programs would continue to be provided and updated.</p>

Project Area/ Alternative Element	Alternative 1: No-Action	Alternative 2: Moderate Change	Alternative 3: Maximum Change
North Gateway	<p>The Arch Parking Garage, surrounding landscape, and ranger station would remain.</p> <p>Access to the Arch Parking Garage would be provided via a slip lane onto Washington Avenue from the reconfigured I-70 ramp, from Laclede's Landing, and from Leonor K. Sullivan Boulevard</p>	<p>The Arch Parking Garage would remain and aesthetic improvements would be made to the structure and landscape. The ranger station would remain in the Arch Parking Garage.</p> <p>Access to the Arch Parking Garage would be provided via a slip lane onto Washington Avenue from the reconfigured I-70 ramp, from Laclede's Landing, and from Leonor K. Sullivan Boulevard.</p>	<p>After a parking strategy is implemented, the Arch Parking Garage would be demolished and replaced with a new landscape including an orientation/event lawn, a welcome center, and a children's garden. Washington Avenue east of Memorial Drive would be closed to through traffic, a shared pedestrian/ bicycle path would be installed, and a drop-off area would be established.</p> <p>The ranger station would be moved to the maintenance facility at the south end of the park.</p>
East Slopes	East Slopes would remain as presently configured	Two to four universally accessible paths would be integrated into East Slopes leading from the park to the Central Riverfront. The East Slopes would be planted with a combination of conservation mown areas and woodland planting. The conservation mown areas would be used as places for visitors to sit.	
Reflecting Ponds	The plantings and turf around the ponds would be unchanged.	Universally accessible paths into the landscape around the North and South ponds, swales to catch stormwater runoff and a stormwater management system would be installed.	
Processional Walks	The Processional Walks would be maintained and improved and the Rosehill ash trees would be replaced in accordance with the EAB EA.	The Rosehill ash trees would be replaced with another species in phases; the subsurface soil conditions, irrigation and drainage systems would be repaired or replaced; and the aggregate concrete surface of the walks would be replaced. The ash tree replacement would be guided by the EAB EA.	
Old Courthouse	Exhibits and access to the Old Courthouse would remain unchanged.	<p>The galleries would be renovated and new exhibits would be installed on the first and second floors and the surrounding streetscape would be improved.</p> <p>Accessibility to the first floor of the Old Courthouse would be improved by exterior ramps and to the second floor by interior elevators</p>	
Central Riverfront	The existing roadway, sidewalks, lighting, and utility infrastructure along Leonor K. Sullivan Boulevard would remain unchanged.	The elevation of Leonor K. Sullivan Boulevard would be raised from Chouteau Avenue to Biddle Street. A multi-modal roadway would be established providing a two-way bike path and a pedestrian promenade along Leonor K. Sullivan Boulevard. The existing two-lane roadway would be narrowed and would include raised pedestrian crossings at the base of the Grand Staircase and at the new crosswalk locations at the base of the East Slope paths and could include designated bus drop-off/pick-up lanes.	

Project Area/ Alternative Element	Alternative 1: No-Action	Alternative 2: Moderate Change	Alternative 3: Maximum Change
Security	Existing perimeter security and visitor screening would be maintained.	<p>A continuous secure perimeter would be established using vehicle ram barrier walls and bollards. Remote operated mechanical bollards would be installed at the former intersections Market and Chestnut Streets with Memorial Drive, where emergency vehicle access would be provided. Entrances to the East Slopes would have a bollard system that meets vehicle protection criteria, and also provide a means to be removed or lowered for maintenance needs. Other bollards throughout the park (Service Rd, Poplar St, Old Cathedral, Washington Avenue and the Arch Parking Garage) would remain or be replaced in kind.</p> <p>Visitor security screening would remain in place at the Arch legs.</p>	<p>Same as alternative 2, except that the shared bicycle path would serve as the perimeter security in the North Gateway.</p> <p>Visitor screening would occur in the main lobby of the new West Entrance. The ramps at the Arch legs would serve as egress-only ramps and a guard would be posted to monitor each exit and prevent unauthorized entry.</p>
Accessibility	Pedestrian routes that do not meet accessibility standards would remain from the park grounds to the Central Riverfront, and into the Visitor Center/Museum. Access between the park and the city across the Park Over the Highway would be accessible.	<p>Routes to and within the park would be made accessible via selective re-grading and the addition of a secondary network of paths, including around the ponds and to the Central Riverfront from the park. Access to the park across the Park Over the Highway would be accessible.</p> <p>Visitors with disabilities accessing the Arch from the North Gateway would be directed to use existing elevator facilities in the Arch Parking Garage in order to access the park.</p> <p>At the Arch legs, lightweight, infill ramps would be added on top of the existing ramps and exterior ramps would be added to provide an accessible entrance and egress route into the Visitor Center/Museum.</p> <p>Accessibility to and within the Old Courthouse would be improved with ramps on the exterior of the building and elevators on the interior of the building.</p>	<p>Same as alternative 2, except accessible routes would be added to the North Gateway. The elevated walk would create an accessible route from North 1st Street to the park. An accessible link between the city, the park and the Central Riverfront would be added along Washington Avenue via the pedestrian and bicycle pathway. The existing connections underneath the Eads Bridge to Laclede's Landing would be accessible.</p> <p>The new West Entrance to the Visitor Center/Museum would be accessible.</p> <p>The lightweight accessible ramps at the Arch legs described in alternative 2 would be egress-only</p>

Project Area/ Alternative Element	Alternative 1: No-Action	Alternative 2: Moderate Change	Alternative 3: Maximum Change
Topography and Grading	No grading would occur and topography would remain unchanged	<p>Luther Ely Smith Square would be re-graded to provide a large plaza at its western edge that slopes gently downward to the confluence of the extensions of the Processional Walks, across the Park Over the Highway over I-70 that would be constructed by MoDOT.</p> <p>Any changes to the existing berm and the lawn area underneath the Arch would be subject to additional design review requirements and Section 106 compliance.</p> <p>Slight re-grading of the northwest corner of the park (in the North Gateway) would occur to create an accessible connection into the park at the intersection of Washington Avenue and Memorial Drive.</p>	<p>The new entrance to the Visitor Center/Museum would require modification of the topography of the berm that currently runs along the western edge of the park between the Old Cathedral and Washington Avenue.</p> <p>Any changes to the existing berm and the lawn area underneath the Arch would be subject to additional design review requirements and Section 106 compliance.</p> <p>The Arch Parking Garage would be demolished, creating a level surface below the existing elevation and would be filled to create a new landscape and path transitions between the park and the adjacent neighborhoods and amenities.</p> <p>The central pathway through the North Gateway would slope down to the Central Riverfront, creating a long gentle valley. At the bottom, the Explorers Garden would include several shallow depressions.</p>
Parking	Parking for visitors and employees would be provided in the Arch Parking Garage		The Arch Parking Garage would be demolished and a parking strategy to facilitate access to nearby parking for visitors, park staff and others would be implemented.

Project Area/ Alternative Element	Alternative 1: No-Action	Alternative 2: Moderate Change	Alternative 3: Maximum Change
Planting	Plantings and turf would remain.	<p>Proposed plantings would follow the original design intent, be compatible with the historic landscape, and would implement sustainable management practices. Planting typologies would include high use turf, conservation mown areas, woodland plantings, and single-species allée plantings.</p> <p>Plantings lining the paths from Luther Ely Smith Square and crossing over the depressed highway would be comprised of shrubs that would not grow high enough to interfere with the Saarinen conceived vista from the Old Courthouse to the Arch. Canopy trees would be planted along the gentle berms at the exterior edges of the long lawn that would run at a lower elevation over the Park Over the Highway and create a pair of densely planted passages.</p> <p>The majority of the plantings in the North Gateway would be limited to the northwest intersection, planting at or on the structure of the garage as feasible, and planting of the streetscape adjacent to the garage</p>	<p>Same as alternative 2, except plantings directly in front of the West Entrance to the Visitor Center/Museum would be comprised of shrubs and small trees that would not grow higher than the berm or interfere with the Saarinen conceived vista from the Old Courthouse to the Arch.</p> <p>The North Gateway, with the removal of the Arch Parking Garage, would include conservation mown areas and high-use turf on the large lawn.</p>

## HOW ALTERNATIVES MEET PROJECT OBJECTIVES

As noted previously, the action alternatives carried forward for detailed analysis in this EA must meet the project objectives described in chapter 1. Both action alternatives (alternatives 2 and 3) were evaluated against the objectives as a way of assessing how well they satisfy the purpose of the project and resolve the need for action. These alternatives were developed from elements of the winning entry in the design competition called for by the park's recently completed GMP. The park and its partners worked together to ensure the design competition itself and the subsequent refinement of the winning design reflect the status of the Gateway Arch, and embrace the Mississippi River. The interdisciplinary value analysis processes generated recommendations for extensive improvements within and adjacent to the park while ensuring requirements of the NPS Organic Act and Management Policies 2006 are met. Through substantial input from Section 106 consulting parties, character-defining elements of the National Historic Landmark and National Register Historic District are honored and preserved to the extent possible, and unacceptable impacts to cultural resources within and outside the park are avoided or mitigated. In some cases, some changes (e.g., landscaping) would be more in line with the original design intent for the park.

While alternative 3 would do a better job of providing opportunities to catalyze increased vitality in the greater St. Louis metropolitan area (by providing new and re-arranged space in the underground Visitor Center/Museum and new park landscapes at the North Gateway), both alternatives promote extended visitation in downtown by substantially increasing connections between the city, the park, and the river. Additional improvements would enhance and expand visitor experiences, and are expected to contribute to socioeconomic benefits, including: enhanced landscapes; enhanced accessibility for persons with disabilities; new and/or improved museum exhibits, interpretation, and education opportunities; and the multi-modal roadway along the central riverfront.

Both alternatives improve accessibility for persons with disabilities and create more welcoming environments, including at the Old Courthouse. However, alternative 3 does a better job by providing a new West Entrance to the Visitor Center/Museum and dedicated, accessible egress from the Arch legs.

New exhibits and education opportunities, especially under alternative 3, give the NPS and its partners an avenue for improving visitor understanding of the purpose of the park. Reduced flooding along the Central Riverfront provides more opportunities for visitors to use this area and for partners to develop programs connected to the river and levee. A reduction in regular flood events along the Central Riverfront would also help improve operations in this project area. Within the park, the proposed changes would improve park management and operations and reduce long-term maintenance requirements by incorporating sustainable landscape practices; improving stormwater management; and improving energy efficiency where possible. The NPS would also work with park partners to minimize the impact of these projects on financial resources and staffing requirements.

Table 2 Summary of Environmental Consequences

Impact Topic	Alternative 1: No-Action Alternative	Alternative 2: Moderate Change	Alternative 3: Maximum Change
<p>Historic Buildings, Structures, Sites, Objects, and Districts</p>	<p>Parkwide and locally, construction-related impacts under the no-action alternative would result in short-term minor adverse impacts to character-defining features of the NHL District such as vegetation and topography. The addition of the Park Over the Highway landscaping would also have long-term minor adverse impacts to these features, but would also have long-term beneficial impacts for example on the setting of the NHL District.</p>	<p>Parkwide and locally, construction would result in short-term moderate adverse impacts to the NHL District due to, for example, addition of ramps at the Visitor Center/Museum, paths around the ponds and along the East Slopes, and the addition of the Park Over the Highway landscaping. Modifications for accessibility would occur at the Old Courthouse.</p> <p>This alternative would involve some alteration of historic buildings, structures, sites, objects, and districts through the addition of accessibility and security measures that alter the visual character of the resources and their settings and parkwide and local long-term moderate adverse impacts would occur. Negligible to minor short-term and long-term impacts on resources within the cultural resources impact area would occur along the riverfront, affecting the NHL District and Eads Bridge. Beneficial impacts would result from changes such as the replacement of the ash trees and repair of the Processional Walks.</p>	<p>Parkwide and locally, construction would result in short-term moderate adverse impacts to the NHL District due to, for example, the addition of the new West Entrance, ramps at the Visitor Center/Museum, paths around the ponds and along the East Slopes, and changes to the park landscape along the Central Riverfront. Modifications for accessibility would occur at the Old Courthouse.</p> <p>This alternative would involve some alteration of historic buildings, structures, sites, objects, and districts through changes addition of accessibility and security measures that alter the visual character of the resources and their settings and parkwide and local long-term moderate adverse impacts would occur. Negligible to minor short-term and long-term impacts on resources within the cultural resources impact area would occur along the riverfront, affecting the NHL District and Eads Bridge. Beneficial impacts would result from changes such as the replacement of the ash trees, repair of the Processional Walks and removal of the Arch Parking Garage.</p>

Impact Topic	Alternative 1: No-Action Alternative	Alternative 2: Moderate Change	Alternative 3: Maximum Change
Archeological Resources	Ground-disturbing activities related to maintenance activities and the installation of the Park Over the Highway landscape in the no-action alternative could disturb as-yet unidentified archeological resources; however, mitigation measures would be implemented to minimize impacts and alternative 1 would result in minor adverse impacts to archeological resources.	Parkwide and along the Central Riverfront, ground disturbances related to the project elements including the Park Over the Highway could disrupt or displace as-yet identified archeological resources; however, mitigation measures would be implemented and alternative 2 would result in moderate adverse impacts to archeological sites.	Parkwide and along the Central Riverfront, ground disturbances related to the project elements including the Park Over the Highway, the new West Entrance, and the Visitor Center/Museum addition could disrupt or displace as-yet identified archeological resources; however, mitigation measures would be implemented and alternative 3 would result in moderate adverse impacts to archeological sites.
Museum Collections	Existing collections storage and exhibit spaces, access, and climate control conditions would remain and alternative 1 would result in minor short-term adverse and long-term negligible to minor adverse impacts to museum collections.	The temporary disruption in access to museum collections during construction under alternative 2 would result in short-term minor adverse impacts. The improvements to collections storage, exhibit, and interpretation spaces would have long-term beneficial impacts to museum collections.	The temporary disruption in access to museum collections during construction under alternative 3 would result in short-term minor adverse impacts. The expansion of and improvements to collections storage, exhibit, and interpretation spaces would have long-term beneficial impacts to museum collections.
Vegetation	The no-action alternative would result in minor short-term adverse impacts due to temporary disturbances during implementation of the planted landscape across the Park Over the Highway. There would be negligible long-term impacts to vegetation as regular maintenance and existing conditions would continue.	Alternative 2 would result in moderate short-term adverse impacts due to temporary disturbances of a relatively large amount of vegetation during construction. Minor long-term adverse impacts to vegetation would occur due to the permanent removal of a limited amount of vegetation. Long-term beneficial impacts would also occur due to an increase in vegetation health and diversity.	Alternative 3 would result in moderate short-term adverse impacts due to temporary disturbances of a relatively large amount of vegetation during construction. Long-term beneficial impacts would occur from a substantial increase in the amount of vegetation as well as an increase in vegetation health and diversity.
Soundscape	The no-action alternative would result in minor short-term adverse impacts to soundscapes from noise generated by the installation of the Park Over the Highway landscape. The continuation occasional operational noises above background conditions would cause minor long-term adverse impacts to soundscapes.	Alternative 2 would result in moderate short-term adverse impacts to soundscapes due to intermittent noise above background conditions generated by construction activities to implement project elements. The continuation of occasional operational noises above background conditions would cause minor long-term adverse impacts to soundscapes. The potential for sound attenuation from landscape additions to the park would create long-term beneficial impacts by reducing noise intruding on the park's soundscape.	Alternative 3 would result in moderate short-term adverse impacts due to intermittent noise above background conditions generated by construction activities to implement project elements. The continuation of occasional operational noises above background conditions would cause minor long-term adverse impacts to soundscapes. The potential sound for attenuation from landscape additions to the park and the removal of vehicular traffic noise sources in the North Gateway would create long-term beneficial impacts by reducing noise intruding on the park's soundscape.

Impact Topic	Alternative 1: No-Action Alternative	Alternative 2: Moderate Change	Alternative 3: Maximum Change
Floodplains	There would be no disturbance to floodplains and therefore no short- or long-term impacts to floodplains in alternative 1.	Construction-related activities under alternative 2 would not change floodplain functions or values and no short-term impacts would occur. The changes to the Central Riverfront would not alter the nature of the development in the floodplain or its functions and values and would have negligible long-term impacts to floodplains.	Construction-related activities under alternative 3 would not change floodplain functions or values and no short-term impacts would occur. The changes to the Central Riverfront would not alter the nature of the development in the floodplain or its functions and values and would have negligible long-term impacts to floodplains.
Water Resources	Construction-related impacts under the no-action alternative would result in short-term minor adverse impacts to water resources due to an increased potential for soil erosion and transport of surface pollutants into adjacent water bodies and storm sewers. As the site would continue to operate under current conditions, pollutants in stormwater runoff would enter the Mississippi River during storm events and long-term minor adverse impacts to water resources and water quality would occur.	Alternative 2 would result in minor short-term adverse impacts during construction due to an increased potential for soil erosion and transport of surface pollutants into adjacent water bodies and storm sewers. Minor long-term adverse impacts would occur due to an increase in water use for irrigation in the park and the continued stormwater runoff that contains pollutants entering the Mississippi River during storm events. Beneficial impacts would also occur as new methods used to reduce and treat stormwater and a reduction in the use of pesticides would be implemented.	Alternative 3 would result in moderate short-term adverse impacts to water resources during construction due to an increased potential for soil erosion and transport of surface pollutants into adjacent water bodies and storm sewers. Minor long-term adverse impacts would occur due to an increase in water use for irrigation in the park and the continued stormwater runoff that contains pollutants entering the Mississippi River during storm events. Beneficial impacts would also occur due to new methods used to reduce and treat stormwater, increased vegetation, and a reduction in the use of pesticides.
Visitor Use and Experience	Construction of the Park Over the Highway landscape under the no-action alternative would result in short-term negligible to minor adverse impacts as visitor access to the West Gateway would be limited during construction. Long-term negligible to minor adverse impacts to visitor use and experience would occur as new destinations, activities, and improvements would not be added to the park and flooding events would continue to limit access to the Central Riverfront. The Park Over the Highway landscape would have long-term beneficial impacts to visitor use and experience due to the improved landscaped pedestrian connection between downtown and the park.	Construction-related impacts under alternative 2 would result in short-term moderate adverse impacts to visitor access to activities and destinations within areas of the park that could be limited or changed to accommodate construction. In the long term, there would be beneficial impacts to visitor experience and satisfaction due to the increase in destinations, activities, and accessibility within the park and along the Central Riverfront and the improved landscaped pedestrian connection between downtown and the park. Minor adverse impacts to visitor use and experience would also occur due to a continued shortage of oversize and short-term vehicle parking.	Construction-related impacts under alternative 3 would result in short-term moderate adverse impacts to visitor access to activities and destinations within areas of the park that could be limited or changed to accommodate construction. Long-term minor adverse impacts to visitor use and experience would occur due to the change in the designed visitor's entry approach to the Visitor Center/Museum and a continued shortage of oversize and short-term vehicle parking. In the long term, there would be beneficial impacts to visitor experience and satisfaction due to the increase in opportunities, destinations, activities, and accessibility within the park and along the Central Riverfront and the new West Entry that would provide a direct pedestrian connection between downtown and the park.

Impact Topic	Alternative 1: No-Action Alternative	Alternative 2: Moderate Change	Alternative 3: Maximum Change
Socioeconomics	<p>Construction-related spending impacts from implementation of the Park Over the Highway landscape under the no-action alternative would have a short-term beneficial economic impact on the local economy as spending could generate revenue for individual businesses in the region. Long-term economic impacts in downtown St. Louis and the region would be negligible as no other broad changes in management, visitation, or operations would occur and visitorship levels and visitor spending in the local area would likely follow existing trends. There would be continued minor short- and long-term adverse impacts to socioeconomic resources as the livability benefits provided by the overall park would not be enhanced and periodic flooding along the Central Riverfront would continue. The park and the Central Riverfront would continue to have a short- and long-term local beneficial economic impact on the region driven by visitor spending and operational expenditures.</p>	<p>Construction-related spending impacts under 2 alternative would have a short-term beneficial economic impact on the local economy as spending would generate revenue for individual businesses in the region. Short-term minor adverse local impacts could also occur during construction if visitation declines while access to areas of the park is limited. Actions under alternative 2 would increase visitorship levels as well as visitor and operational spending by increasing and improving visitor facilities and infrastructure throughout the park and the Central Riverfront and connecting the park with the city and the river, which would have long-term beneficial economic impacts in downtown St. Louis and the region and would enhance the overall livability and social benefits the park and the Central Riverfront provide.</p>	<p>Construction-related spending impacts under 3 alternative would have a short-term beneficial economic impact on the local economy as spending would generate revenue for individual businesses in the region. Short-term local minor to moderate adverse impacts could also occur during construction if visitation declines while access to areas of the park is limited. Removal of the Arch Parking Garage would have long-term minor adverse impacts due to the loss of a revenue-generating facility. Actions under alternative 3 would increase visitorship levels as well as visitor and operational spending by increasing and improving visitor facilities and infrastructure throughout the park and the Central Riverfront and connecting the park with the city and the river, which would have long-term beneficial economic impacts in downtown St. Louis and the region and would enhance the overall livability and social benefits the park and the Central Riverfront provide.</p>
Operations and Management	<p>Operations impacts related to construction under the no-action alternative would include short-term minor adverse impacts as maintenance operations access to the Park Over the Highway construction areas would be limited. Flooding events would cause long-term minor to moderate adverse impacts on operations by limiting park maintenance access and require clean-up action by City of St. Louis staff. The lack of energy conservation and sustainable management practices would also contribute to the long-term adverse impacts.</p>	<p>Operations impacts related to construction under alternative 2 would include short-term minor to moderate adverse impacts due to increased use of energy and resources and limited access to areas of the park during construction. An increase in maintenance requirements would have a long-term minor adverse impact on park operations. Improved maintenance conditions, improved sustainability standards, and the potential for an overall reduction in energy and water use at the park would have long-term beneficial impacts</p>	<p>Operations impacts related to construction under alternative 3 would include short-term moderate adverse impacts due to increased use of energy and resources and limited access to areas of the park during construction. An increase in maintenance requirements and the loss of parking revenue would have a long-term minor adverse impact on park operations. Improved maintenance conditions, increased ticketing efficiency and revenue collection, improved energy efficiency and sustainability standards, and the potential for an overall reduction in energy and water use at the park would have long-term beneficial impacts.</p>

## ALTERNATIVES OR ALTERNATIVE ELEMENTS CONSIDERED BUT NOT CARRIED FORWARD

Council of Environmental Quality (CEQ) regulations for implementing NEPA require federal agencies explore and objectively evaluate all reasonable alternatives to the preferred alternative, and to briefly discuss the rationale for eliminating any alternatives that were not considered in detail. This section describes those alternatives or alternative elements that were identified during the design process and internal and public scoping but were not carried forward for analysis in this EA. Justification for eliminating alternatives from further analysis was based on factors relating to:

- Technical or economic feasibility;
- Conflicts with the statement of purpose and need, or other policies;
- Duplication with other, less environmentally damaging or less expensive alternatives; and
- Severe impact on environmental or historic resources.

For the purposes of this process, the NPS considered but dismissed the original winning design competition entry from the Michael Van Valkenburgh Associates team, as selected by the jury during the CityArchRiver 2015 competition, in September 2010. The concept and rationale for its dismissal are described below.

### DESIGN COMPETITION ENTRY

#### Concept

The winning design competition entry, as submitted by the MVVA team, proposed numerous changes to the park and surrounding areas of downtown St. Louis, as well as the riverfront in East St. Louis. The winning design called for a new west entrance with skylights that led to an expanded underground Visitor Center and Museum of

Westward Expansion. The design proposed to renovate the existing museum, and turn the entrances at the legs of the Arch into exits for visitors. The proposed design included approximately 58,000 square feet of new museum space, and 72,000 square feet of renovated existing gallery space.

In East St. Louis, the winning design proposed a green riverfront, the installation of wetland reserve, pedestrian and bicycle trails, and a water taxi between St. Louis and East St. Louis. At the North Gateway, the design proposed to replace the existing parking deck with a new landscape park, which included various programmed and passive recreational spaces and a below-grade parking garage. At the South Gateway, the design proposed to remove the maintenance facility and add a beer garden, and ice skating rink, and below-grade parking. An underground parking structure was also proposed below Luther Ely Smith Square. Along the park's east slopes, the design included partial re-grading and crash barriers along Leonor K. Sullivan Boulevard. At the north and south service areas, rooftop terrace/structures were proposed. A structure was also proposed near the Old Cathedral.

A substantial element of the winning design was the proposed 1+ block landscape structure over I-70, connecting Luther Ely Smith Square (and by extension the larger Gateway Mall) with a new west entrance to the underground Visitor Center/Museum. In the design concept, a reconfigured Memorial Drive remained open to traffic in front of the new Visitor Center and Museum entrance. At Luther Ely Smith Square, tulip poplar-lined walkways connected the Old Courthouse to the new west entrance of the Visitor Center and Museum.

Along the walks and allées within the park, the design proposed to replace the existing ash trees with a tulip poplar allée. Adjacent to the existing ponds within the park, the construction of new accessible walkways down to the ponds was proposed. The existing lawn was replaced by a meadow and shrub woodland planting plan and new plantings were proposed throughout the park.

## Rationale

Many of the proposed concepts from the winning design competition entry evolved to become part of the action alternatives previously described in this chapter. Other elements were ultimately dropped from consideration by the design team, for a variety of reasons. Among the biggest changes from the winning design competition entry to the revised design unveiled to the public in January 2011 include:

- Changes to the structure over I-70 and the closing of Memorial Drive;
- relocation of the beer garden to Kiener Plaza and removal of the ice rink;
- addition of the aerial tram;
- the maintenance facility remaining in the south gateway;
- a smaller museum expansion;
- removal of the proposed underground parking garages at Luther Ely Smith Square, the North Gateway, and the South Gateway;
- removal of skylights;
- changes to Cathedral Square; and
- the removal of the rooftop terrace/structure over the shipping and receiving entrance to the museum.

These changes to the winning design competition entry were facilitated by meetings amongst the CityArchRiver 2015 Foundation, the Technical Advisory Group (TAG) convened by the CityArchRiver 2015 Foundation, NPS, and the design team. The subsequent ongoing design discussions and the Value Analysis workshops that occurred in the summer of 2011 all resulted in changes to the original winning design competition entry. As a result, the team agreed that the winning design competition alternative should be considered but dismissed.

Reasons for dismissal include:

- Incompatible elements not possible due to NPS policy, such as removing the recently constructed maintenance facility on the south end of the park;
- proposed uses not consistent with the park purpose and significance, such as beer gardens and ice rinks;
- potential costs, such as the underground parking at Luther Ely Smith Square, or the proposed square footage expansion of the underground museum;
- severity of impacts to cultural resources, in particular cultural landscapes and archeological resources due to proposed structures at the north and south service areas within the NHL, the visibility of skylights at the west entrance, and substantial excavation for below-grade parking structures; and
- not meeting the goals and objectives of the GMP, for instance, the continued existence of Memorial Drive in front of the new western entrance to the underground visitor center and museum, preventing improved connectivity between the park and the city.

The changes to the East St. Louis side of the Mississippi River are still being considered as part of the CityArchRiver 2015 Initiative; however, proposed actions in East St. Louis are not ready for a decision at this time as project elements, funding, federal permitting, and other issues are still being defined. Therefore, the project elements in East St. Louis were not considered in this EA.

## OTHER CONCEPTS CONSIDERED

### East Entry

During the Value Analysis process, the interdisciplinary team considered the addition of an east entrance to the Visitor Center/Museum with an above-ground expression to the east of the Arch, between

the Arch legs and the Grand Staircase. This project element was dismissed due to significant impacts on the cultural landscape and financial feasibility.

### **Old Courthouse Accessibility**

In order to provide for accessibility into and around the Old Courthouse, the installation of exterior masonry ramps and free standing elevators were considered. The impacts to cultural resources, in particular the historic fabric of the Old Courthouse, were too significant, and the alternative carried forward in the EA would achieve the same results; therefore, these ideas were dismissed.

### **Arch Parking Garage**

During a Value Analysis workshop, the interdisciplinary team considered the potential to renovate the Arch Parking Garage with a landscape deck or demolish a portion of the garage. It was determined that these options had considerable technical, structural, and financial feasibility issues and therefore were dismissed from further analysis.

### **Central Riverfront**

During a Value Analysis workshop several additional alternatives were considered by the workshop group but were not carried forward. One of these alternatives proposed raising the elevation of Leonor K. Sullivan Boulevard approximately two feet only between the North and South Overlooks steps. This alternative was dismissed as it only provided additional pedestrian access to the limited area between the steps and therefore did not improve connections between the city, the park, and the riverfront.

Another alternative was considered which would raise the roadway surface approximately two feet from Chouteau Avenue to Biddle Street but also proposed that the area in front of the Grand Staircase be raised an additional two feet to provide additional pedestrian and event protection from flooding in the most highly used area. This alternative was dismissed because the

overall four-foot rise in front of the Grand Staircase was judged to be too significant an encroachment on this historic feature.

Another alternative considered during the development of the project concept was complete refurbishment of the roadway, the addition of a larger dedicated bike path, and an improved pedestrian promenade, but without elevating the roadway surface above existing elevations. This alternative was not carried forward as it failed to improve Central Riverfront operations by reducing flood-related closures and cleanup activities.

Another alternative considered was raising the elevation of Leonor K. Sullivan Boulevard to protect the road surface from a 100-year base flood event. The alternative was dismissed after a Hydrologic Engineering Centers River Analysis System analysis indicated that the Leonor K. Sullivan roadway would need to be elevated 14 feet to achieve protection from a 100-year flood event. A 14-foot increase in elevation would be unachievable from a constructability standpoint, would have unacceptable impacts to the park, and would increase the 100-year base flood elevation of the Mississippi River, which is prohibited under Federal Law.

## ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The NPS is required to identify the environmentally preferred alternative in its NEPA documents for public review and comment. The Department of Interior regulations implementing NEPA state that the environmentally preferred alternative is the alternative “that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historic, cultural, and natural resources” (43 CFR Part 46.30).

While the no-action alternative (alternative 1) would do little damage to the biological and physical environment, alternatives 2 and 3 would have limited adverse impacts on natural resources, primarily from construction-related activities. However, these alternatives would also provide some long-term benefits to natural resources, primarily by enhancing the health of and expanding the amount of vegetation at the park, and improving stormwater management practices.

Despite these benefits, implementation of either alternative 2 or 3 would cause adverse impacts to integrity of cultural resources in and near the park. While these impacts would be avoided, minimized, or mitigated to the extent possible in accordance with the Programmatic Agreement developed under Section 106 of the NHPA, such impacts would not occur under alternative 1. As a result, the NPS has identified alternative 1 as the environmentally preferable alternative.

**The alternative that best protects, preserves, and enhances historic, cultural, and natural resources while causing the least damage to the biological and physical environment is the “environmentally preferred alternative.”**

## NPS PREFERRED ALTERNATIVE

To identify the preferred alternative, the planning team held discussions based on the CEQ guidance for implementing NEPA, which defines the agency’s preferred alternative as that alternative “which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors” (CEQ 1981). The deliberations on the preferred alternative considered the mission of the NPS at Jefferson National Expansion Memorial; how well each alternative meets the purpose, need, and objectives of the EA and the goals of the 2009 General Management Plan (from which this EA is tiered); the results of value analysis conducted during design development; and the results of the impact analysis presented in the EA

The park has recommended alternative 3 as its preferred alternative to the Regional Director of the National Park Service’s Mid-West Regional Office. The projects considered in alternative 3 were all developed from elements of the winning entry in the design competition called for by the park’s recently-completed GMP. The NPS refined these elements through subsequent interdisciplinary value analysis processes and substantial input from Section 106 consulting parties, and used the recommendations from those efforts as the basis for alternative 3.

Although alternative 3 would cause some impacts to the integrity of the designed landscape and some historic structures, this alternative best accomplishes the goals set out in the recently completed GMP to revitalize the park by expanding visitor experience and creating connections with downtown St. Louis and the riverfront. In light of potential impacts to cultural resources, the NPS has worked with its Section 106 consulting parties to develop a Programmatic Agreement that outlines measures to protect cultural resources and to the extent possible avoid, minimize, and mitigate impacts on the National Register Historic District, the National Historic Landmark, and other nearby National Register-listed or eligible sites.

Alternative 3 also best meets other objectives described in this EA by providing increased connections between the park, downtown, Laclede's Landing, and the riverfront. Creating a new West Entrance to the park would provide benefits including a more direct connection to downtown, a more welcoming experience, and more efficient entry to the underground Visitor Center/Museum. Changes to the Old Courthouse, the underground Visitor Center/Museum, and the North Gateway would also provide more access and opportunities for persons with disabilities, opportunities to provide new and expanded exhibits, and more opportunities to experience the park's stories and interpretive themes.

Alternative 3 also minimizes the impacts of flooding on the Central Riverfront, contributing to the overall socioeconomic benefits of the projects by expanding opportunities for visitor access and programming in this area. Additional benefits would also be realized through the use of more sustainable landscape and facility management practices which would improve the health of vegetation at the park, improve stormwater management, and minimize the impact of the projects on water and energy consumption and long-term operation and maintenance needs.





# 3. Affected Environment

Jefferson National Expansion Memorial  
Environmental Assessment for Implementing CityArchRiver Initiative Elements



# Affected Environment

## INTRODUCTION

This chapter describes the existing environment at Jefferson National Expansion Memorial and along the Central Riverfront. The discussion is focused on resources that could potentially be affected by the implementation of any of the alternatives and provides a baseline for the subsequent evaluation of impacts documented in Chapter 4.

The topics within this chapter are discussed in the following order:

### Cultural Resources

- Historic Buildings, Structures, Sites, Objects, and Districts
- Cultural Landscapes
- Archeological Resources
- Museum Collections

### Natural Resources

- Vegetation
- Soundscape
- Water Quality/Water Resources/  
Stormwater Management
- Floodplains

### Visitor Use and Experience

- Visitor Opportunities and Use
- Pedestrian and Bicycle Circulation
- Parking
- Accessibility

### Socioeconomics

### Operations and Management

- Park Operations and Management
- Energy Requirements and Conservation/  
Sustainability
- Central Riverfront Operations and  
Management

Several topics were initially considered for evaluation, but were eliminated from detailed study because impacts would be negligible to minor. These topics are discussed in the Issues Considered but Dismissed from Further Analysis section in Chapter 1.

## CULTURAL RESOURCES

This section documents the cultural resources that are present at the park and within the surrounding area, which include historic buildings and structures; cultural landscapes; archeological resources; and museum objects.

## CULTURAL RESOURCES IMPACT AREAS

This EA is being prepared in parallel with an ongoing Section 106 compliance process for the CAR2015 projects, as required by the NHPA of 1966. This EA will document impacts to cultural resources as a result of implementing these projects on park properties and along the Central Riverfront. A separate assessment of effect under section 106 of the NHPA will be made as appropriate. Figure 24 depicts the Cultural Resources Impact Area for the EA and the location of these cultural resources.

## HISTORIC BUILDINGS, STRUCTURES, SITES, OBJECTS, AND DISTRICTS

There are multiple, overlapping National Register of Historic Places and National Historic Landmark (NHL) listed properties at the Jefferson National Expansion Memorial. The National Register of Historic Places identifies five property types to categorize listed and eligible properties, including buildings, structures, sites, objects, and districts. Properties are described in summary below, organized by relationship to the park

and the Central Riverfront project areas and the cultural resources impact area. Each property's location is identified in Figure 24. Listed historic properties are discussed in greater detail in the GMP within Appendix C: Detailed Descriptions of Historic Resources within the APE. Some historic properties are located within the park; others are adjacent to the park. Other historic properties, while not in or adjacent to the park, are adjacent to the Central Riverfront. Additional historic properties fall within the project cultural resources impact area but are not adjacent to either the park or Central Riverfront.

### Within the Park Grounds

There are historic properties that are listed in the National Register of Historic Places and/or the City of St. Louis Landmarks registry within the park boundary, including the Jefferson National Expansion Memorial National Register and NHL districts, the Gateway Arch, and the Old Courthouse and its associated sundial and fountain, described as follows.

#### Jefferson National Expansion Memorial

Jefferson National Expansion Memorial was nominated to the National Register of Historic Places in 1966 and accepted in 1977. The nomination form identifies the property as a historic district and includes the entire park landscape, paying particular attention to three historic features: the Gateway Arch, the Old Courthouse, and the Old Cathedral. The nomination lists the status of the property as a "work in progress" (NPS 1966).

In 1987, the property was designated a NHL district. The park was thought to be so important and transcendent in its design elements that the designation was made before it reached 50 years old under the exception in the National Register criteria that states, "a property achieving national significance within the past 50 years [may be designated] if it is of extraordinary national importance." The boundaries of the NHL are slightly different from the previously designated National Register historic district, and include only the portion of the park east of Memorial Drive, north of Poplar Street south of the Eads Bridge (see Figure 24). The National Register and NHL districts both encompass the park

**The Jefferson National Expansion Memorial is listed on the National Register of Historic Places and is also designated a National Historic Landmark due to its significance. The park commemorates, through a designed memorial, Thomas Jefferson's vision of building a unified continental nation and St. Louis' role as a confluence and gateway of the American westward expansion during the 19th century.**

landscape and several historic structures including the Gateway Arch, Old Courthouse, the Visitor Center and Museum of Westward Expansion, the North and South Overlooks, Grand Staircase, and railroad tunnels. The Arch, Old Courthouse, and Old Cathedral have also been identified as individually eligible or listed. The following are not listed separately in the National Register, but are character-defining for the designed landscape within the Jefferson National Expansion Memorial NHL:

#### The Park Grounds

The Gateway Arch is sited within a distinctly modern landscape. The product of a collaboration between master architect Eero Saarinen and master landscape architect Dan Kiley, the grounds design complements, enhances, and carries out into the surrounding landscape the graceful form and lines of the Arch. The two men applied geometric forms and classical landscape design elements to create a setting that is both spectacularly and subtly appropriate. The scale, impact, and design of the grounds constitute an essential mooring for the world-famous Gateway Arch.

#### The North and South Overlooks

The scenic overlooks were designed to provide visitors with a vantage point from which to view the Mississippi River. They were originally intended to house museums on the fur trade and the use of Mississippi and Missouri rivers. The overlook stairs have a unique form, in which the riser remains constant while the tread increases in size as

LEGEND

- - - - Park Boundary
- - - - NHL Boundary
- Area of Potential Effect

1. North Riverfront Industrial Historic District
2. Ashley Street Power Plant
3. St. Louis Levee
4. Missouri Athletic Club Association Building
5. J. Kennard and Sons Carpet Company Building
6. Laclede's Landing Historic District
7. Security Building
8. Mississippi Valley Trust Company Building
9. Laclede Building
10. Old Courthouse, fountain, and sundial
11. Eads Bridge
12. North and South Overlooks
13. Railroad tunnel cuts
14. Gateway Arch
15. Museum of Westward Expansion
16. Grand Staircase
17. International Fur Exchange
18. American Zinc, Lead and Smelting Company Building
19. Old Cathedral
20. Pet Plaza
21. St. Mary of Victories Church
22. Crunden-Martin Manufacturing Company Historic District
23. Peabody Coal Company National Headquarters
24. Wainwright Building
25. MacArthur Bridge



**Figure 24 Historic Architectural Resources within the Cultural Resources Impact Area**

the steps descend to the Mississippi River. This design element was also intended to be used in the Grand Staircase, although it was not realized there. Although the museums on the overlooks were never completed, the overlooks, constructed of concrete in a unique form that employs both vertical and horizontal catenary curve segments in both the walls and the stairs, are major structural elements of the Saarinen/Kiley designed landscape of the park grounds, and thus contribute to the significance of the NHL.

**Grand Staircase**

The Grand Staircase provides both a physical and a visual connection between the Gateway Arch and the Mississippi River. The staircase is a symbolic representation of the movement of settlers through St. Louis, the gateway to the West. Although the relationship between the treads and risers was modified in its final design, it is representative of the Saarinen/Kiley concept and is in its designed location. It thus contributes to the significance of the NHL.

### Railroad Tunnels

The north and south railroad cuts and three tunnels were designed by Saarinen, and were important components of his concept for the site. Constructed between 1959 and 1962, the entrances to the tunnels are curved to recall the geometry of the Gateway Arch. The north tunnel (548 feet long), the center tunnel (960 feet long), and the south tunnel (360 feet long) carry the railroad through the site in conjunction with the open north and south cuts, which have poured concrete walls and are 720 feet and 840 feet long, respectively. The railroad tunnels and concrete floodwalls, reflecting the Saarinen/Kiley design concept, contribute to the significance of the NHL.

### The Gateway Arch

The Gateway Arch, the centerpiece of the park's design, is listed separately from the district as a NHL structure, as well as contributing to the NHL district. It was conceived by Eero Saarinen in 1947 as a symbolic gateway to the West. Although the placement of the Gateway Arch and the design of the grounds evolved over the next several decades, the original design of the Gateway Arch endured with little change. An inverted, weighted catenary curve (a type of curve created by supporting both ends of a hanging chain), the Gateway Arch soars 630 feet from

its base on a constructed landform on the bank of the Mississippi River. It is composed of a series of stacked, triangular stainless steel sections covered by a stressed steel skin. The latter feature allows the exterior materials to carry the structural load without major interior framing. Inside the legs of the Gateway Arch, a unique transportation system carries visitors to an observation deck at the top of the monument.

Entrance ramps at the base of the Gateway Arch lead into the subterranean Visitor Center and Museum of Westward Expansion. Conceived by Saarinen and Kiley in 1959, the placement of these triangular features beneath the Gateway Arch, out of sight until one is nearly upon them, reinforced the Saarinen/Kiley concept of a unified landscape, in which the curvilinear character of the Gateway Arch is repeated throughout the design, such as in the walkways and the landform. The museum was designed by Aram Mardirosian and completed in 1976.

The Gateway Arch is significant for its commemoration of Thomas Jefferson's role in the nation's westward expansion. In addition, it is significant as a triumph of architecture and engineering. It is an icon of Modernist design, using the latest materials and sculptural forms available in the late 1950s and early 1960s to develop a design that specifically

Figure 25 The Gateway Arch and Reflecting Pond within the Park Grounds





**Figure 26 The Old Courthouse and Luther Ely Smith Square**

responds to the site and fully integrates architecture and landscape architecture. As noted in the significance statement of the NHL nomination, “Its structural system had never been attempted before on so massive a scale. Its highly complex and subtle design based on a weighted catenary is unique in architecture. The Arch is a symbolic architectural expression of such simplicity and modernity that even today . . . it still seems avant-garde.”

#### The Old Courthouse

The Old Courthouse stands within the National Register district for the Jefferson National Expansion Memorial as a contributing building, as well as being individually eligible for National Register listing. It was constructed in several phases between 1839 and 1862. The three-story Greek Revival brick and stone building was constructed in the shape of a cross with large classical porticoes (or porches) on all four facades. A central rotunda is capped by a Renaissance Revival cast iron dome and lantern. The lightweight cast iron structure of the dome was patented by the architect, William Rumbold. It was one of the first uses of this engineering technique in the United States. The same materials were used, in conjunction with a different patent, in the dome of the U.S. Capitol Building in Washington, D.C.,

which was built concurrently with the Old Courthouse dome. The St. Louis project was the first cast iron dome to be completed in the U.S. The inside of the dome is decorated with elaborate murals. The surrounding reproduction sidewalks and fence have also been identified by the National Park Service as contributing to the interpretation of the Old Courthouse.

The building is significant both for its architectural and engineering merits, and also as the site of important historic events. Early in its history, the courthouse was a public gathering space for people planning their travel west. More notably, the structure was the site of the historic Dred Scott case in which Scott, a slave, sued for and was awarded his freedom. Freedom was later taken away from the Scotts by an appeal to the Missouri Supreme Court, and the case was ultimately decided by the U.S. Supreme Court in *Dred Scott v. Sandford* in 1857. In the infamous decision of the court, persons of color were denied citizenship. Slavery in the Western territories was deemed to be a property right that could not be extinguished by legislation. In 1971, the Old Courthouse was designated a City Landmark. Associated features include two objects - the Old Courthouse Sundial and Southeast Courtyard Fountain.

The Old Courthouse Sundial: Constructed of bronze, copper, iron, and granite, the sundial is the only surviving detached exterior feature associated with the courthouse. The circular bronze sundial face has Roman numerals and is protected by a copper cover. The National Park Service has determined that the object is eligible for listing in the National Register as a contributing element to Jefferson National Expansion Memorial National Register district together with the Old Courthouse.

The Southeast Courtyard Fountain: Located in the southeast courtyard of the Old Courthouse grounds, this fountain is on the NPS List of Classified Structures, and is considered an historic structure. The National Park Service has determined that the object is eligible for listing in the National Register as a contributing element to the Jefferson National Expansion Memorial National Register district together with the Old Courthouse.

### **Adjacent to the Park**

There are listed properties adjacent to the park, including the Eads Bridge, Old Cathedral, the Laclede's Landing Historic District, and the St. Louis Levee, summarized as follows:

#### **Eads Bridge**

Eads Bridge, a National Historic Landmark, borders the park to the north, connecting St. Louis, Missouri and East St. Louis, Illinois across the Mississippi River. Constructed between 1867 and 1874 to accommodate rail, pedestrian, and vehicular traffic, the bridge employs a three-span deck arch design, with ribbed steel arches and decks supported on granite-faced limestone piers. At the time of its construction, the spans were larger than any previously constructed bridge. Significant for its pioneering design, construction methods, and materials, the bridge was named a National Historic Landmark in 1964, and a National Historic Civil Engineering Landmark by the American Society of Civil Engineers in 1971. It was designated a City of St. Louis Landmark that same year (NPS 1975a).

#### **Old Cathedral**

The Old Cathedral building is individually eligible for the National Register. The parcel occupied by the Old Cathedral was designated for religious purposes when the city was founded in the mid-18th century by Pierre Laclede and Auguste Chouteau. A log house and small church were built on the site in the late 18th century. In 1826, St. Louis became a Catholic diocese, and several years later construction began on the current church. Completed in 1834, the Greek Revival Style structure was the first cathedral established west of the Mississippi. In 1961, Pope John XXIII named the building the "Basilica of St. Louis, King of France," the highest honor bestowed upon an American Catholic church.

#### **Laclede's Landing Historic District**

The Laclede's Landing National Register historic district is a nine-block area north of the Memorial, bounded by the Mississippi River to the east, Eads Bridge to the south, 3rd Street to the west, and the Dr. Martin Luther King Memorial Bridge to the north. The district is significant as the only surviving portion of the city's 19th-century commercial waterfront. It preserves a large number of cast iron commercial buildings, as well as the city's original 18th-century street grid and sloping topography. Laclede's Landing was listed in the National Register in 1976. Within the district, the Christian Peper Building at 719 North 1st Street is a City Landmark.

#### **St. Louis Levee**

The St. Louis levee is located between Carr Street on the north and Lombard Street on the south, and from the western edge of Leonor K. Sullivan Boulevard on the west to the Mississippi River on the east. The Missouri SHPO has determined the levee to be eligible for inclusion on the National Register of Historic Places under Criterion A in the area of commerce. It also has strong associations with transportation, and potentially ethnic heritage.

The St. Louis levee is significant for its role in supporting the commerce that transformed St. Louis into the primary commercial emporium of the American West. The levee has various important social history associations and was the point of departure for expeditions of exploration, fur trade enterprises, and troops headed to war with Mexico and later the Southern Confederacy. The St. Louis waterfront was inextricably bound up in the larger story of the nation's westward expansion during the 19th century. The levee was also a place with significant associations with African-American heritage in terms of both labor and cultural history. It was the place where thousands of enslaved persons were brought in chains to be herded up the street to the auction houses and sold as strong, "northern" slave stock to southern plantation owners. Many free African Americans in St. Louis were employed transporting and storing goods for transfer to other vessels. The historically paved portion of the St. Louis levee retains sufficient integrity to be listed on the National Register of Historic Places (NPS and City of St. Louis 2012).

#### The International Fur Exchange Building

The International Fur Exchange Building, located at 2-14 South 4th Street, is directly southeast of the Old Courthouse. The period of significance runs from 1920, when the building was constructed, through 1948. The building has national importance due to its association with the primacy of the city in the international fur trade. The commercial structure is seven stories high and is clad in multicolored brick with white terracotta accents. It was listed in the National Register in 1998.

#### Along the Central Riverfront

There are listed properties that are not adjacent to the park, but are located along the Central Riverfront, such as the North Riverfront Industrial Historic District and the Ashley Street Power House, summarized below.

#### North Riverfront Industrial Historic District

The North Riverfront Industrial Historic District is located north of downtown St. Louis adjacent to the Mississippi River, along the Central Riverfront. The eight contributing buildings are located on seven city blocks roughly bounded by Dickson, Lewis, O'Fallon, 2nd, Ashley, and Biddle Streets and the Mississippi River. Heights range from one story to six, with four large smokestacks on the roof of the Ashley Street Power House towering over the District. Most of the buildings are of red brick, although two use brown brick as their primary exterior material. The district is listed on the National Register.

In a section of the city nearly wiped clean by the tornado of 1896 but rich with connections to rail lines and the Mississippi River, this small grouping is an important concentration surviving in the midst of what was once a larger linear industrial and commercial district. Two specific industries, power generation and cold storage, account for five of the eight contributing buildings. All buildings and their major additions were constructed between 1894 and 1919, most falling within the first seven years of the 20th century (1900-1906). The period of significance begins in 1894, the construction date of the oldest building, and ends in 1953, an arbitrary 50-year cutoff. Although not every building is completely intact, the district retains sufficient integrity to convey the scale of the industrial and commercial activities that thrived here in the early 20th century (NPS 2002).

#### Ashley Street Power House

The Ashley Street Power House is located in the North Riverfront Industrial Historic District at the north edge of the Central Riverfront, and is listed as a contributing structure to that National Register listed historic district. The Power House is located at the foot of Ashley Street on the Mississippi River. Constructed in 1902 by engineer/architect Charles Ledlic, it was the first large electrical power plant to be erected by the Union Electric Company. The classic exterior

is organized by a series of terra cotta arches supported on fluted, iconic pilasters which read as two extra-tall stories high. The South elevation may be considered the primary elevation since it faces downtown St. Louis and bears the original name (Union Electric Light & Power Co.) in terra cotta across and below two pediments. Above the arches is a dentil course. The top story of large windows is topped by a dentil cornice with two projecting shallow pediments. Four large smokestacks and a set of multi-story metal additions are located on the building's roof (NPS 2002).

The St. Louis riverfront has a storied history as the focus of industrial and commercial activity. Ashley Street Power House conveys the character of an early 20th century industrial center. This richly detailed building in close proximity to rail and river offers a rare insight into the way industry worked at the dawn of the 20th century. The building became a City Landmark in 1971.

#### **MacArthur Bridge**

The MacArthur Bridge is part of a 6.2 mile long elevated track which crosses the Mississippi River, connecting St. Louis with Illinois. Construction of the bridge began in 1907, but was not completed until 1917. The MacArthur Bridge and elevated track is the second-longest elevated steel structure across the Mississippi River. Originally constructed with a road deck over the rail deck, the bridge is currently used only for railroad traffic (TRRA 2012 and St. Louis Post Dispatch 2009).

#### **Within the Study Area**

The following historic properties fall within the project cultural resources impact area but are not directly adjacent to the park or the Central Riverfront: the J. Kennard and Sons Carpet Company Building, the Missouri Athletic Club Association Building, the Security Building, the Laclede Building, the Peabody Coal Company National Headquarters, the Mississippi Valley Trust Company Building, the American Zinc, Lead and Smelting Company Building, Pet Plaza, St. Mary of Victories Church, and the Crunden-Martin Manufacturing Company District. These properties are described in the 2009 General Management Plan Appendix C.

The Wainwright Building is also located within the study area, but is not described in Appendix C. The Wainwright Building, listed in the National Register of Historic Places, is a ten-story office building constructed between 1890 and 1891. Dankmar Adler and Louis Sullivan designed the building, which was their first commission involving the use of completely iron and steel framing. The resulting design represents Sullivan's most thorough attempt to create a special form appropriate to the multi-story office block (NPS 1975b).

## **CULTURAL LANDSCAPES**

A cultural landscape is defined as “a geographic area, including both cultural and natural resources . . . therein, associated with a historic event, activity, or person, or that exhibit other cultural or aesthetic values” (NPS 1998).

### **Background**

The Jefferson National Expansion Memorial was acknowledged initially as a National Register property in 1977 for the significance of its outstanding architecture and engineering, and for its memorialization of the nation's westward expansion. The park was designated a National Historic Landmark in 1987. The landscape was recognized in early documentation as a vital part of the designed resource, but a detailed documentation of its significance for landscape design was lacking for many years. To rectify this gap in the history of the Arch and its grounds, the National Park Service undertook a Cultural Landscape Report (CLR), published in 1996 (NPS 1996). The CLR provided a detailed history of the designed landscape and its character-defining features, an inventory and condition assessment of existing landscape features, and an updated significance of the park to include the designed landscape (NPS 1996). The CLR was updated in 2010 (NPS 2010). The revised CLR reflects current conditions at the park, further develops and expands the significance statement relating to the grounds as an important example of Modernism, and provides detailed treatment recommendations in coordination with the 2009 General Management Plan (NPS 2010). The 2010 CLR also provides the basis for this section of the report.

## Significance

The period of significance identified in the 2010 CLR for the park landscape is 1947-2003, beginning the year the United States Territorial Expansion Commission sponsored a national design competition, marking the inception of the Memorial idea (NPS 2010), and ending with the completion of the central section of the Grand Staircase.

According to National Register Criteria for Evaluation, properties which are less than 50 years old may be listed on the National Register of Historic Places if they are of “exceptional importance.” The Gateway Arch is recognized as significant because it has architectural and engineering design value which will endure the “test of time.” The merits of the design to the architecture and landscape architecture design professions are eternal and could be recognized before the customary 50-year “test of time.”

The Jefferson National Expansion Memorial is listed on the National Register and is also designated a NHL due to its exceptional significance. The Arch and surrounding designed landscape have national significance under National Register Criterion A for the commemoration of Thomas Jefferson and others responsible for the nation’s expansion to the West. The Arch and grounds mark the symbolic economic hub and embarkation point of westward expansion. In addition, and perhaps most importantly, the park is significant under National Register Criterion C for its architectural and engineering merit, and as the collaboration of a master architect and landscape architect.

An exploration into Saarinen and Kiley’s design philosophies, their design intent for the park, and their working relationship is undertaken in the CLR (NPS 2010). The two men not only created a unique monument to a historic American event, but also collaborated on many other important projects. Their winning design for the Arch and grounds in 1947-1948 launched their respective careers. The Arch and surrounding grounds are an extraordinary example of a Modernist design principle of architecture that addresses the total environment. The impressive Gateway

**Cultural Landscape Report – A report that serves as the primary guide to treatment and use of a cultural landscape, and that prescribes the treatment and management of the physical attributes and biotic systems of a landscape, and use, when use contributes to historical significance.**

Arch was not intended to be an isolated object separate from the site planning and landscape design. Early on, the designers generated the idea of a forested, park-like setting, a simple complement to the majesty of the Gateway Arch, yet with a function and purpose of its own. Saarinen and Kiley’s compelling vision for the park had the strength to sustain their intentions through the subsequent decades of incremental changes, including alterations due to budget constraints and other designers’ development of their concepts.

## Integrity

Typically, when a particular feature existed at the time of the landscape’s period of significance and also retains integrity to that period, then it supports the landscape’s significance. The National Register Bulletin How to Apply the National Register Criteria for Evaluation states that “integrity is the ability of a property to convey its significance. . . Historic properties either retain integrity (convey their significance) or they do not. . . The retention of specific aspects of integrity is paramount for a property to convey significance.” At the park grounds, some features constructed during the period of significance do not contribute to the significance of the park landscape, due to major departures from the 1964 design and the Saarinen/Kiley vision. The seven aspects of integrity are location, design, setting, materials, workmanship, feeling, and association. The park grounds cultural landscape possesses integrity of all seven aspects.

### Landscape Characteristics, Contributing Features, and Character-defining Features

According to the NPS, landscape characteristics are “processes and physical forms that characterize the appearance of a landscape and aid in understanding its cultural value” (NPS 1998a). Landscape characteristics include topography, spatial organization, views and vistas, buildings and structures, circulation, vegetation, constructed water features, and small-scale features.

Landscape characteristics that were determined to embody the original design intent of Saarinen and Kiley are considered to be contributing features of the designed landscape of the park grounds. Contributing features are defined as “biotic or abiotic feature[s] associated with a landscape characteristic that contributes to the significance of the cultural landscape” (NPS 1998a). Key contributing features are discussed below.

Character-defining features represent the essential historic (and in this case, design) qualities that lend the landscape its significance. They are the most “prominent or distinctive aspect(s), quality(ies), or characteristic(s) of a historic property that contributes significantly to its physical

character. Structures, objects, vegetation, spatial relationships, views... may be such features” (NPS 1998). According to the NPS CLR Guide, “The term ‘character-defining feature’ was conceived to guide the appropriate treatment and management of historic structures (and later of cultural landscapes), so that features conveying historic character would be retained by treatment activities” (NPS 1998).

The major character-defining landscape features that contribute to the significance of the park include the Gateway Arch; the overall landform and spatial organization; designed views; the system of walks; the single species allées; the two ponds; the overlooks including the stairs; the railroad open cuts and tunnels; the Grand Staircase; the baldcypress circles; the screen plantings and depressed service areas; the entrance ramps into the Gateway Arch; and the concrete benches.

#### Topography

The landform of the park grounds was created with a substantial amount of fill to raise its elevation further above the Mississippi River. From a level expanse of land directly beneath the Gateway Arch, the ground rises to the north and south of the site. Service areas are located at the low points in the landscape.

**Figure 27** Lawn Directly Beneath the Gateway Arch, Looking Back Towards the Old Courthouse



Constructed overlooks stand at high points at the north and south ends, providing views of the Mississippi River. The landforms are both functional (concealing railroad tracks and service areas) and extend the curvilinear form of the Arch's geometry into the grounds, as intended by Saarinen/Kiley. The ponds, overlooks, and berms define spaces within the park, orchestrate views and visitor circulation, and provide drainage. The designed topography complements the monumental character of the Gateway Arch, and creates a distinction between it and the service areas on the periphery, the railroad tracks, and the more intimate pond areas to the north and south.

Topography is a character-defining feature of the park grounds. The landform was implemented as originally intended, and remains intact today. The few changes made over time have resulted in minimal divergence from the design concept. Some of the berms along Memorial Drive were built taller than designed, but function to conceal views of the roadway and reduce noise and pollution in the park, and are therefore functionally important to the visual quality of the landscape.

- Contributing Feature: Topography.

#### Spatial Organization

The arrangement of spaces in the landscape is designed to emphasize a contrast among the monumentality of the Gateway Arch and surrounding open lawn, the overlooks with their long vistas, and the more enclosed human-scale spaces under the trees. A major spatial organizing feature is the primary east-west axis connection from the Old Courthouse through the Gateway Arch to the Mississippi River. A secondary axis, the north-south system of walks, orchestrates movement within the park. The closely spaced trees along the walks form an enclosing, uniform canopy.

Symmetry is another important organizing feature of the landscape. The curving pathways, allées of trees, irregular ponds, and structures in the northern portion of the grounds mirror the features of the southern end. This symmetry enhances the formality established by the major north-south and east-west axes.

The major concepts of the park—the historical importance of the movement from east to west, and the city's crucial relationship to the river—are expressed through the spatial organization of the design. In addition, the designed contrast between the monumental spaces of the Gateway Arch environs and the intimate spaces along the canopy-shaded walks supports the narrative essential to the story of westward expansion—that is, the movement from the populated, small-scale spaces of the east to the less-populated, vast spaces of the west.

The overall spatial organization of the property remains the same as the Saarinen/Kiley plan. A few minor departures from their plan occur in the planted forms and density used along the east-west axis, Memorial Drive, around the operations areas, in Luther Ely Smith Square, and around the ponds. However, the strength of the designed spatial organization of the park grounds continues to be character-defining.

#### Contributing Features:

- System of walks and allées
- Primary axis between the Old Courthouse and the river
- Pond areas
- Overlooks (including staircases)
- Old Courthouse block
- Service areas

#### Views and Vistas

Views are a key feature of the Saarinen/Kiley design. The most well-known of these, the view east from the Old Courthouse through the Gateway Arch to the Mississippi River, is along the primary designed axis that organizes the park grounds, described above in Spatial Organization. This view establishes a crucial connection between the park, the city, and the river.

The secondary north-south axis and associated views along the walks leading to the Arch are key elements of the Saarinen/Kiley design. Views towards the Gateway Arch from the north and south emphasize the immense verticality of the monument. Views of the park from the base of the Gateway Arch are dominated by the views along the central east-west axis and by the enclosing

rows of ash trees. The designed topography and vegetation control visitors' perception of the Gateway Arch by framing its immense scale and sculptural form. In addition, they screen undesirable views, hiding the service areas to the west of the Arch and the structures at the north and south ends of the park from view. The views from the system of walks and from the north and south reflecting ponds to the Arch are also created by the designed topography and plantings. The alternation of enclosing tree canopy and open areas were intended by Saarinen and Kiley to provide dramatic views of the Gateway Arch from certain points along the visitor's journey through the park towards the Arch.

The North and South Overlooks were designed by Saarinen and Kiley to provide expansive views of the Mississippi River and the Arch. These views encompass the variety and complexity of the park's urban landscape - the soaring Gateway Arch, the expanse of the Mississippi River, the industrial uses on the river's east bank, and the dense plantings of trees within the park. As such, they are important elements within the cultural landscape.

#### Contributing Features:

- View from the Old Courthouse to the Gateway Arch
- View along the north-south axis
- Views around the ponds
- Views between the park grounds and East St. Louis
- Views from the overlooks
- Screened views of service areas

#### Buildings and Structures

The Gateway Arch, the Old Courthouse, the Visitor Center and Museum of Westward Expansion, the North and South Overlooks, the Grand Staircase, and the North and South Railroad Tunnels are contributing features to the historic landscape. They are discussed in detail above under Historic Buildings, Structures, Sites, Objects, and Districts.

#### Contributing Features:

- Gateway Arch
- Old Courthouse

- Visitor Center and Museum of Westward Expansion
- Grand Staircase
- North and South Overlooks
- Railroad open cut walls and tunnels

#### Vegetation

Dan Kiley proposed a plant palette of 16 tree species in dense plantings to structure and define spaces. His intent was to rely on an intentionally limited number of species, creating a consistent and dense planting to give park landscape spaces a strong sense of character and definition, including circles of baldcypress trees and dense single-species allées of trees along the walks, creating an idealized "forest" contrasting with open areas representing an idealized "meadow."

By the time of major planting installation after the Arch was completed, changes had been made to the Kiley plan as planting was implemented: NPS plans showed an increase in the number of species, and a reduction in the overall number of trees to be planted. The forms of the tree species as planted were also less distinctive and varied in their character than Kiley's proposed species. The greater variety of species, spread more evenly over the landscape, obscured the original intent of the planting.

The overall plant composition in some respects reflects Kiley's design intent, particularly the distinctive planted form of the dense allées of uniform trees along the walks, the open lawn on the vista from the Old Courthouse to the Gateway Arch, and the baldcypress circles. However, in the pond areas, the concept of forest and meadow has been somewhat obscured by the development of a manicured, park-like character composed of small groups and single tree plantings set in a closely clipped lawn. The original intent in tree structure, form, and texture have not always been taken into consideration when tree replacements were made. Areas along the railroad open cuts were not planted as densely as intended in the Kiley planting plan (Office of Dan Kiley 1964). The other existing plantings, including vegetative screening at service areas, open

lawn, plantings in Luther Ely Smith Square, and the use of ash trees in the allées, while not implemented as directed in the Kiley planting plan, are generally compatible with the character of the park landscape.

#### Contributing Features:

- General plant composition
- Single-species allées
- Baldcypress circles

#### Circulation

The curving concrete walks that traverse the site are important elements of the Saarinen/Kiley design, guiding visitor movement through the landscape. There are almost five miles of walkways within the park, and more than two miles around the perimeter of the park. The location and alignment of walks reinforces the east-west and north-south axis of the landscape, orchestrates views towards the Gateway Arch, and reflects the curving geometry of the Arch, thus creating unity in the overall design. The walks were laid out as the designers intended, but NPS landscape architects selected the materials of exposed aggregate concrete.

Leading to the Visitor Center/Museum at the Arch are ramps, steps, and architectural features designed by Saarinen and Kiley and constructed in the 1960s. These provide the current entry experience for the Visitor Center/Museum. Constructed originally of terrazzo, the ramps were later rebuilt in 1983 of granite.

As designed by Saarinen/Kiley and implemented by NPS, vehicular circulation is restricted to the perimeter of the park. Washington Avenue, Poplar Street, Wharf Street (renamed Leonor K. Sullivan Boulevard), and Third Street Expressway (or Memorial Drive) provide the boundaries of, and vehicular access to, the park. The exterior roads total over two miles in length. They are considered contributing elements of the historic landscape as they form the park boundaries; the streetscape appearance and function of these circulation features have changed over time, but they continue to define the edges of the park. While changes to the roads would not necessarily affect the integrity

of the historic landscape, as their contribution to character is generally limited to their spatial function as boundary features, the CLR provides recommendations for streetscape rehabilitation that is intended to improve pedestrian connections (NPS 2010).

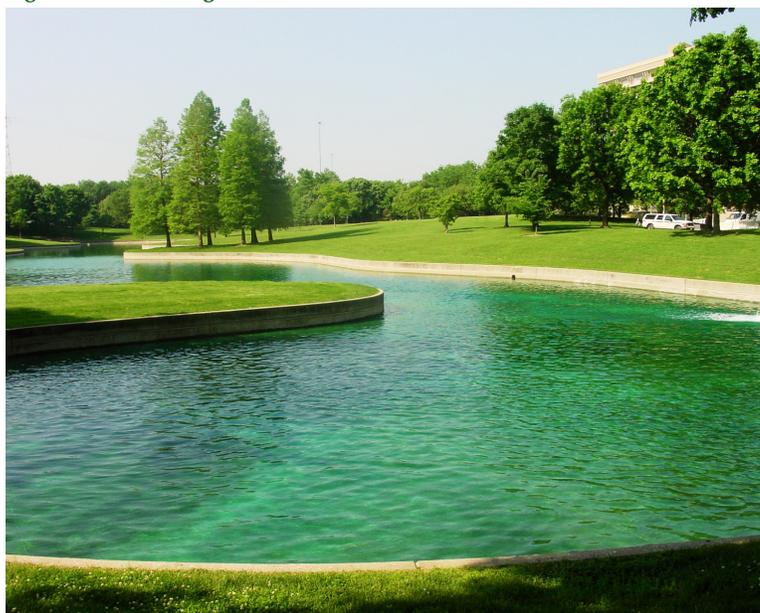
Saarinen and Kiley conceptually planned the Arch Parking Garage and the Old Cathedral Parking lot as part of the original park. As constructed, these features do not express the Saarinen/Kiley design concept and are not considered contributing features of the historic landscape.

Saarinen and Kiley intended there to be pedestrian overpasses across Memorial Drive to provide connections between the park grounds and the Old Courthouse. They designed multiple alternative concepts that included both single and double bridge crossings; these structures were never constructed. Without the pedestrian connections, Memorial Drive and I-70 physically and visually separate the Gateway Arch from Luther Ely Smith Square and the Old Courthouse.

#### Contributing Features:

- Pedestrian Walks
- Gateway Arch entrance ramps and steps
- Perimeter roads

**Figure 28 Reflecting Pond**



### Constructed Water Features

The north and south reflecting ponds are part of the Saarinen/Kiley concept for the park. Each pond is sited within a topographic depression. The original design for the ponds included deeply incised and irregular edges, creating intimate spaces on their banks. The ponds were also to include small islands on their northern ends, which were to be connected to the landscape by means of narrow footbridges. Neither pond, as constructed, was as large as originally designed by Saarinen and Kiley, nor did they include the islands and footbridges. Their edges were much simplified, and the surrounding planting was also reduced during NPS design development. Despite changes to the details, the ponds remain important elements of the historic designed landscape. Their placement provides separate and intimate spaces that contrast with the more monumental spaces along the east-west axis and beneath the Gateway Arch. In addition, their, stylized curving edges are in keeping with the modern design of the landscape and enhance the overall character of the design.

#### Contributing Features:

- North and South Ponds

### Small-Scale Features

The Saarinen/Kiley team created designs for benches in the park in 1960. The design detail showed ten-foot-long benches, built with limestone seats set on a limestone block with a concrete foundation. The NPS implementation of the benches was almost identical, but fabricated of concrete. These benches were initially placed on the east side of each rest area north and south of the Arch. Eventually, additional benches of this design were added to the landings of the Grand Staircase as well. Benches of an entirely different design—metal frame with iron slats—were installed in Luther Ely Smith Square at an unknown date.

The Saarinen/Kiley team also designed a light standard for the park, but it was never implemented. The early plans for the park did not show proposed lighting locations.

The NPS developed plans and details for the lighting at the park that included a twelve-foot-tall single pole with globe luminaire, which was ultimately installed along the walks, approximately ninety feet apart. They are considered compatible but not contributing to the historic landscape.

Contributing Features: Benches

## ARCHEOLOGICAL RESOURCES

### Physical History: Park Grounds and Central Riverfront

Development of the city of St. Louis has been ongoing from its earliest times as a Euro-American settlement in the 18th century. Archeological information regarding earlier occupation is sparse and known existing archeological resources date to after the Louisiana Purchase. Therefore the potential for early archeological sites from before 1850, including prehistoric archeological sites, is largely unknown on the park grounds and the Central Riverfront.

Archival and photographic documentation demonstrates a multi-layered history of building construction and deposition of materials along the St. Louis riverfront since the city's inception as a fur trading center. Population expansion accompanied a steamboat trade boom in the 1830s that stimulated riverfront development including establishment of a tenement and boarding house district in the old French settlement south of Market Street. An 1849 fire along the wharf engulfed "numerous business and [left] thousands homeless" (Roselle et al 1999). On July 7, 1849, "the City Council instructed the City Engineer to have the rubbish then being hauled from the burned district deposited in the low places on the wharf near Plum Street," at the southern edge of what is now the park grounds (NPS 1954).

Just prior to the Civil War, St. Louis experienced an economic and industrial boom as a result of its river and rail connections, which were strengthened as the waterfront area devastated by the 1849 fire was rebuilt

as a fledgling industrial area. Residential occupation along the riverfront shifted away to the west, “as residents fled the pollution and noise caused by the development, the number of industrial and commercial buildings quickly grew” along the river’s edge (Roselle et al 1999).

A 1907 Sanborn Fire Insurance Company map shows multi-story commercial brick structures dominating the landscape in the area that would later become the park. The 1908 and 1909 Sanborn maps illustrate that the area south of Market Street was almost exclusively industrial warehouses with just a few dwellings, tenements, and lodging houses between Clark and Poplar Streets (Sanborn Fire Insurance Company 1908, 1909). North of Market Street, industrial manufacturing was the dominant land use. Despite this growth, the turn of the century subsequently saw the waning of river-based commerce, with the commercial area slowly abandoned and its structures declining.

The park’s substantial overlay of fill in the 20th century is well known. The remaining buildings in the area designated to become the park grounds were cleared in anticipation of construction of the park between 1939 and 1942. Many of these structures “had at least one, and sometimes two full basements, entailing a minimum of 15-30 feet of ground disturbance” resulting from both their construction and demolition (York 1983). If archeological evidence remains, basement foundations and a variety of subsurface features could be present beneath the park grounds, such as wells and refuse disposal features. In addition, the fill is believed to be composed at least in part of demolition materials, although the origin of the materials is undocumented, possibly originating from buildings razed on the site and/or brought in from elsewhere (NPS 2010).

Regrading of the park was a major operation involving extensive fill and a complete reshaping of the landscape. Starting in late December 1954, the Missouri Highway Department dumped 80,000 cubic yards of earth and rubble fill on the site northward from Clark Street toward the Eads Bridge, between Memorial Drive and Leonor K. Sullivan Boulevard. Almost 300,000 cubic

yards had already been deposited from Clark Street south to the park boundary (NPS 1984). Again in 1958, hundreds of cubic yards of fill were deposited on the site as stipulated by the grading plans and a remaining warehouse south of the Cathedral was removed (NPS 1984).

### Archeological Sites

The study area for archeological resources is the park boundary, depicted on the Cultural Resources Impact Area map (Figure 24); as well as the linear path of the Central Riverfront along the levee. This study area was established based on areas of potential ground disturbance and excavation in the alternatives.

#### Within the Study Area

Archeological surveys previously completed within a one-mile radius of the project area have identified seventeen archeological sites that date to the historic period. In addition, a group of prehistoric mounds known as the St. Louis mound group were documented just outside the one-mile radius to the north of Laclede’s Landing. Early 19th-century accounts describe the mounds site as consisting of 26 pyramids with a two hectare plaza, with the largest “Big Mound” at the northern end of the site (Pauketat 2004). Because of these mounds, St. Louis was nicknamed “Mound City.” The St. Louis mound group was demolished as St. Louis development spread north in the 19th century. The majority of mounds were leveled by the 1870s, and little is known about the site as a result (Milner 1998).

#### St. Louis

Archeological sites 23SL976, 23SL2229, and 23SL2234, previously recorded within St. Louis but outside the park boundaries, include refuse and construction debris dating to the 1840s and 1850s. Like the blocks within the park, the areas where these three sites were found appear to have undergone the pattern of razing buildings and constructing new ones atop the construction debris. Cochran Gardens (Site 23SL2229) provides a good example of this. Located at the southeast corner of O’Fallon Avenue and North Seventh

Street, the Cochran Gardens site was a densely populated residential and commercial area from the mid-19th to the mid-20th century. Here, 19th-century buildings were razed in 1950 and the debris spread on the parcel as the base for an apartment complex. After the apartments were themselves razed in 2002, the rubble was used to fill basements and level the site, and subsequently capped by fill (Altizer, McLaughlin and Harl 2005). This pattern appears to have been the case even in the absence of modern construction. Phase II testing at the Walsh's Row site (Site 23SL2234), remains of row houses built c. 1845 and demolished c. 1935, indicates that modern fill from the demolition overlies brick streets or sidewalks as well as 19th-century brick and mortar building debris (Meyer 2004). These sites were found during excavations for new construction, mostly on blocks that were presumed to have no intact archeological features due to development in the 20th century. In each of the sites, intact deposits including refuse deposits, privies and cistern, were encountered below the rubble.

To the north of the park, there are ongoing archeological investigations due to excavation related to the construction of the New Mississippi River Bridge. Ten historic sites have been identified. The historic sites date from the mid-19th and early-20th centuries and include civic, residential, and commercial property types. Two locations where prehistoric sites were once present in the area were also investigated. The prehistoric sites were associated with Big Mound and the St. Louis Mound group. Testing of the prehistoric sites yielded only a handful of prehistoric artifacts in disturbed contexts and no intact prehistoric deposits or features were identified (MoDOT 2011).

No sites have been documented in Chouteau's Landing to the south of the park, though construction to the south along Lafayette Avenue (site 23SL338) revealed four cisterns intact with artifacts dating from the mid- to late 19th century (Fairchild 1979, in Roselle et. al. 1999).

#### Within the Park Grounds

In addition to the sites and surveys in the vicinity, several archeological investigations have taken place within the park grounds. These excavations and subsurface examinations were focused on identifying intact pre-1849 features and deposits within the park. Excavations within the park boundaries were undertaken in 1960 by NPS Archeologist Zorro Bradley. Subsequently, Bradley suggested that 35 sites of historic importance were beneath the ten to thirty feet of fill deposited east of the 2nd Street area on the basis of historic documentation (Bradley 1960). The deepest portion of this fill extends east from a north-south line in the vicinity of 2nd Street to the area of the railroad cut along Commercial Street. Seven additional sites were identified between 2nd and Memorial, presumably under little to no fill; two were thought to have been previously disturbed or obliterated by more recent construction. Remnants of the 1810 office of Dr. Farrar, an important early St. Louis physician, were tentatively identified in this area. An additional four sites were thought to exist in proximity to the Old Cathedral (Bradley 1960). Following additional limited excavation in 1961, it was determined that "the historic structures . . . sought no longer existed or were too deeply buried to warrant excavation" (Bradley 1976). The subsequent two excavations yielded a few artifacts, none of which appear to have been recovered from in situ deposits.

In 1984-1985, monitoring of construction activities for the Arch Parking Garage spanning the former 1st and 2nd Street areas at the northern edge of the park identified six archeological features, none of which was confirmed as containing intact resources dating to before 1849 (Wells and Williams 1985). In the location of the garage, remnants of the 1st Street limestone block retaining wall were observed at an elevation of 443 feet above mean sea level sitting directly on bedrock and capped by the street's 1882 cobblestones. While some apparently sterile soil was observed below the cobblestones, efforts to remove the capping and examine

the deposits below the street were deemed inadvisable (Wells and Williams 1985). West of 1st Street, excavation revealed a deposit of building and structural debris about nine feet deep sitting directly on bedrock. East of 1st Street, two exposed features were observed within trenches five meters deep, consisting of limestone foundation walls and remnants of an aqueduct or sewer. The foundation walls, while corresponding to the location of the “Cadet” Chouteau House built c. 1825, were more probably a portion of the later W.H. Bull Medicine Factory, which was demolished by the National Park Service between 1939 and 1942 (Woods 1984).

Two additional features were observed running west from 1st Street for nine meters and sitting directly on bedrock. The first, a limestone foundation with a top elevation of 435 feet above mean sea level, was associated with a small amount of late 19th- and early 20th-century material; the second was a brick foundation corner directly to the north. A third feature at the west end of the site was associated with late 19th- and early 20th-century material. No associated diagnostic information or artifacts were found, and the matrix of building rubble encountered led to the conclusion that “. . .in situ features if they exist, will be located below the 436.0-foot elevation that excavation is now, or up slope west of 1st Street” (Wells and Williams 1984 and Woods 1985). The findings suggested that “post-1849 urban renewal had destroyed any earlier structures present above grade elevation [436.0 feet above mean sea level] prior to commencement of excavation for construction of the parking facility” (Wells and Williams 1984 and Woods 1985).

Archeological monitoring in 1999 for the construction of the maintenance facility at the south end of the park also indicated the potential for archeological resources. Here, auger bore samples hit the limestone bedrock at 9.25 to 13.5 feet below surface, trending to a maximum of 38.5 feet below surface in the northernmost boring observed. Dense brick rubble was seen in many of the borings ranging from below the present asphalt surface

to depths of three to ten feet; an undated abandoned sewer line also appeared to have been hit in a separate boring. NPS Archeologist Vergil Noble concluded that “it is well known that the grounds here were landscaped on urban fill after the buildings were razed” (Noble 1999).

The archeological investigations within the park have typically yielded historical construction debris and partially disturbed architectural and infrastructure features dating to the second half of the 19th century. The focus of many investigations has been on identifying pre-1849 resources; as a result, little is known regarding later historic features. However, the post-1850 architectural and infrastructural features that have been identified indicate the potential presence of additional historic resources that may meet National Register eligibility criteria. Much of the park has not been subjected to archeological investigations. While all archeological reports acknowledge that the deep fill in the eastern portion of the park severely limits the potential for archeological deposits to be disturbed in future construction, the presence of intact deposits and features cannot be discounted.

In a 1960 memorandum between the park’s Archeologist and Superintendent, the archaeologist pointed out the following:

Over the past four years an artificial fill running from 10 to over 30 feet deep has been dumped over the Memorial area in preparation for final landscaping. The deepest portion of this fill extends eastward from a north-south line in the vicinity of Second Street to the area of the railroad cut along Commercial Street.

Due to the slope of the original ground surface, the section of the park west of 2nd Street has the highest potential to yield archeological deposits that are not covered by deep fill and that may be affected by future development. Unexamined areas in the central western area of the park in particular may yield additional information, including areas around the Old Courthouse and Luther Ely Smith Square

that are in relatively undisturbed contexts and could contain intact, relatively shallow deposits pre-dating the industrial development of the area. The area between 1st and 2nd Streets, however, may also have a medium to high archeological potential depending on the depths of future ground disturbing activities. Portions of the southern area are expected to have medium archeological potential as a result of the rubble fill. Sites like Cochran Gardens, Walsh's Row, and Lafayette Avenue in Chouteau's Landing illustrate that, even under deep fill and building rubble, intact material may remain. Further, the piercing of a possible 19th-century sewer line in the southern area of the park suggests the potential presence of intact infrastructural remains that may pre-date or be contemporaneous with the Fire of 1849, including waterworks developed in 1830, gas light infrastructure from c. 1847, and sewer systems in place by 1850.

## MUSEUM COLLECTIONS

The park's collection consists of 1,347,086 cataloged items: 10,257 objects and 45 archival collections. There are 8,941 history objects, 860 archeological objects, 342 ethnology objects, 54 geology objects, and 60 natural history objects. There are 411 cataloged objects on display in the Museum of Westward Expansion and 529 items on display in the Old Courthouse (NPS 2009). The purpose of the collection is to preserve historic artifacts and to support understanding of the park's themes through exhibits, research, and interpretive programs.

The cultural collection is sub-divided into four disciplines: archeology, ethnology, history, and archives. Collections are used for permanent and temporary exhibits in the Museum of Westward Expansion and Old Courthouse, and for staff and public research. Archeological holdings from excavations done in association with site work are administered by the NPS Midwest Archeological Center in Lincoln, Nebraska. Ethnological materials in the collection consist of American Indian clothing, weapons, tools, and domestic items such as basketry and pottery. A collection of architectural materials is on long-term loan to Southern Illinois University, Edwardsville for cataloging and study.

The history collection forms the bulk of the Museum of Westward Expansion collection, and focuses on the history of westward expansion, St. Louis history, the Old Cathedral, and Gateway Arch construction. Objects associated with the history of westward expansion include clothing, tools, equipment, weapons, household goods, personal items, and transportation devices that are representative of those used in exploring and settling the Trans-Mississippian West between 1804 and 1890. To interpret the city's growth and development of the "Gateway to the West," objects in the collection include many of these items manufactured in St. Louis. Included in this category are documented furnishings of the Old Courthouse and selected samples of historic fabric removed from park structures during approved restoration projects. Also included in this category is a large collection of pharmaceutical artifacts and documents from a St. Louis pharmacy in the 1890s. There is also a small collection of fine art, including works by Thomas Moran and Ansel Adams.

The park archives include materials which document the creation of the park, the clearing of the site, the architectural competition of 1947-1948, the selection of the Saarinen/Kiley design concept, the planning and construction of the Gateway Arch and landscape, the restoration of the Old Courthouse, and other important events in the park's history. Another notable collection in the archives consists of extremely detailed records, including photographs of the buildings that were razed to create the park site. The archives also contains other collections relevant to park resources and themes, including interviews and papers related to widows of frontier soldiers, a collection of papers and images of western forts, a research collection of Lewis and Clark materials, insolvent debtor records from 1815-1870 and a small but important collection of contracts awarded for original construction of the Old Courthouse in the 1850s-1860s.

## NATURAL RESOURCES

The inventory and characterization of physical and biological resources provide a baseline for analysis of potential impacts discussed in Chapter 4. The natural resources at the Jefferson National Expansion Memorial and along the Central Riverfront discussed in this section include vegetation, soundscapes, water quality/stormwater management, and floodplains. Other natural resources that have been dismissed from further analysis are discussed in Chapter 1. The study area for the inventory and analysis of physical and biological resources is the park grounds and the Central Riverfront. The park is bounded by Eads Bridge to the north, Leonor K. Sullivan Boulevard to the east, Poplar Street Bridge to the south, and Interstate 70 to the west, plus a two-block extension to incorporate the Old Courthouse and Luther Ely Smith Square. The Central Riverfront is located along Leonor K. Sullivan Boulevard between the Mississippi River and the park, to the east and west, and Biddle Street and Chouteau Avenue to the north and south.

## VEGETATION

The park grounds are a formally planned, designed, and planted landscape. It is highly maintained with no extant naturally occurring native plant communities. The park's plants include a mixture of ornamental native and non-native deciduous and evergreen trees, as

well as a few shrubs, expanses of maintained turf lawn, and ground cover. Mature Rosehill ash trees (*Fraxinus americana* "Rosehill"), the park's major planting, are planted in tree pits and along the park's paved walks. The majority of the trees in this urban planting are approximately 40 years of age, far older than the typical lifespan expected for urban plantings in similar conditions. The ash trees have begun to decline and will continue to do so as they age and naturally reach senescence; a number of them have already been removed (NPS 2011a). Vegetation along the Central Riverfront consists of street trees along portions of Leonor K. Sullivan Boulevard and several small grass-covered areas. Vegetation is limited due to the urban and paved nature of the area.

Of major concern is the vulnerability of the park's predominant ash plantings to the emerald ash borer (*Agrilus planipennis* Fairmaire). This exotic wood-boring insect feeds primarily on ash trees. The emerald ash borer larvae feed under the bark of a tree and cut off the flow of water and nutrients in the tree's vascular system. Affected ash trees die within several years of infestation (NPS 2011a). As of July 2010, the emerald ash borer has been detected in 15 states including Missouri (Missouri Department of Conservation 2011). At this time, the emerald ash borer has not been detected within 150 miles of St. Louis or at the park. The emerald ash borer's life cycle does not include traveling long distances; it typically is spread through the transportation of infested wood and wood products.

**Figure 29** Processional Walks and Allées of Uniform Trees along the Walk



## SOUNDSCAPE

### National Park Service Policy on Soundscape Management

A portion of the National Park Service mission includes protecting and enhancing soundscapes within units of the national park system. Director's Order 47 provides guidance on soundscapes. A soundscape refers to the total acoustic environment of an area. Depending on the purposes and values of the park, both natural and human-caused sounds may be desirable and appropriate in a soundscape. Soundscapes often vary in their character from day to day and from season to season and can be affected by changes in the numbers of visitors who introduce human-caused sounds into the environment. The NPS policies require that the National Park Service restore degraded park soundscapes to the natural condition wherever possible, and protect natural soundscapes from unacceptable impacts (NPS 2006).

Noise is generally defined as unwanted or objectionable sound that alters or disturbs quality of life or communication. It also may affect physical health. Most environmental noise, particularly in urban areas, consists of a variety of frequencies of common, distant noises that create relatively constant background noise levels. Periodic loud noises such as horns honking, trucks driving by, or low-level aircraft overflights are easily perceived above background noise levels. Noise levels are usually measured and expressed in decibels (dB) that are weighted to frequencies perceivable by the human ear, known as A-weighted sound levels or dBA. Noise levels are typically measured over a set period of time (one hour, eight hours, or 24 hours) and are commonly expressed as dBA Leq, which represents the equivalent or average noise level in dBA for a given time period.

### Noise Regulations and Policies

The City of St. Louis Revised Code Chapter 15.51 regulates stationary sources of industrial noise and sets permissible noise levels for various zoning districts. Stationary noise sources are defined as any equipment, motor

vehicle, aircraft, or facility, fixed or movable, capable of emitting audible sound. Noise from stationary sources within the central business district is generally limited to 70 dBA or less if the duration of the noise generating activity exceeds 60 minutes. This limitation would apply to construction and other activities on the park grounds. In addition, Chapter 15.50.081 prohibits construction activity within 1000 feet of a residential property before 6:00 a.m. and after dusk, except in case of an "urgent necessity."

### Current Conditions on the Park Grounds

The park is surrounded on three sides by major roadways which include the elevated Eads Bridge to the north, Interstate 70 and Memorial Drive to the west, and the elevated Poplar Street Bridge to the south. To the east, it is bounded by Leonor K. Sullivan Boulevard along the Mississippi riverfront. A below-grade railroad corridor runs parallel to the river below-grade along the eastern part of the park grounds.

In general, the soundscape at the park is typical of a busy urban area. The soundscape at the park is dominated by fairly loud urban background noise from traffic on surrounding roadways. The traffic noise is loudest closest to the roadways. While the background traffic noise is perceptible everywhere, it diminishes towards the center of the park near the Gateway Arch and reflecting ponds due to natural attenuation and intervening topography and plantings. Trains moving across Eads Bridge and in the below-grade cuts in the eastern portion of the park can be periodically perceived above background noise levels. Commercial aircraft fly over or near the park on approach to and departure from the international airport at Lambert Field, but these noise events are typically of short duration. Horns from ships on the Mississippi River and other noises from the surrounding urban environment contribute to the existing soundscape.

Other sources of noise at the park include:

- The emergency generators which are tested monthly;
- Grounds maintenance equipment such as lawn mowers;

- Helicopters taking visitors on aerial tours from a barge moored on the riverbank below the park;
- Music broadcast from nearby riverboats; and
- Music from riverfront and park special events.

Visitors near the emergency generator building when the generators are operating would likely be able to hear the generators above the background noise. Similarly, visitors near maintenance activities such as

lawn mowing would hear noise from the maintenance equipment. As discussed above, visitors near the below-grade railroad tracks when trains are passing are able to hear the trains above background noise levels. During special events at the park, there is increased noise due to crowds, vehicles, and amplified sound systems.

While not covered by the NPS policy on protecting and restoring soundscapes within national parks, noise along the Central Riverfront is considered in this EA. Like the park, noises perceived along the Central Riverfront come from the surrounding urban environment, in particular roadway noise from Leonor K. Sullivan Boulevard, noise from helicopters taking off and landing at the barge moored along the riverbank in front of the park, and noise from riverboats. The Central Riverfront passes underneath three bridges that carry interstate highway traffic, the Poplar Street Bridge, Eads Bridge and the Martin Luther King Bridge, which each generate roadway noise.

## **WATER QUALITY/ STORMWATER MANAGEMENT**

### **Water Quality**

The park grounds and Central Riverfront are located in the Cahokia-Joachim watershed. The surface waters in the watershed flow to the Mississippi River along the eastern boundary of the park and along the Central Riverfront. The water quality of the Mississippi River is affected by human activities throughout the watershed. Water pollution is generated by non-point source pollution, such as

stormwater runoff; and point source pollution, such as wastewater treatment or industrial discharges.

The section of the Mississippi River in proximity to the park has been placed on the 303(d) list by the State of Illinois for having high levels of fecal coliform, manganese, and PCBs (EPA 2004). The Section 303(d) list is one of two basic approaches the Clean Water Act uses to protect and restore water bodies. The 303(d) list includes those water bodies and watersheds that exhibit levels of degradation requiring investigation and restoration. Once a water body has been identified on the Section 303(d) list, a Total Maximum Daily Load (TMDL) must be developed for each pollutant that is impairing the water body. A TMDL is the maximum amount of a pollutant that can be introduced into a water body in order for that water body to achieve or remain in compliance with applicable water quality standards (EPA 2010). Missouri developed a TMDL for the Mississippi River as it passes along the state to reduce levels of chlordane and PCBs in fish tissues (MDNR 2006).

Section 305(b) of the Clean Water Act requires that local agencies issue a report to the EPA and Congress every two years describing the water quality of 303(d) listed streams. In 305(b) reports, water bodies are categorized based on the degree to which water quality affects the use of the water bodies. According to Illinois Section 303(d) list for the section of the Mississippi River that passes through the study area, water quality only partially supports the uses of the river as a public water supply, for primary contact recreation, and for fish consumption due to fecal coliform, Polychlorinated biphenyls, mercury, and manganese contamination (Illinois EPA 2011).

### **Stormwater Management**

The storm sewer system within the park is quite complex, as there are numerous local storm drains and storm sewer lines located across its 91 acres. Some of these storm drains direct runoff into the reflecting ponds on the park grounds. The ponds are therefore an integral component of the site's stormwater system. Both ponds have algal blooms, likely related to the use of fertilizer on the park's

lawns which runs off into the ponds both directly and via the stormwater system.

Stormwater collection sumps are located on both the north and south sides of the central portion of the park. One of these stormwater collection sumps is located near the emergency generator building. A submerged pump moves stormwater from this collection area into the North Reflecting Pond. A similar stormwater collection sump is located near the shipping and receiving area at the south service tunnel. A submerged pump moves stormwater from this collection area into the South Reflecting Pond.

Storm flow is held in the North and South Reflecting Ponds where it is then re-circulated or allowed to drain offsite once the water level reaches the top of the overflow structures. The North Pond overflow is directed through a 36-inch storm outfall directly to the Mississippi River (described below), and the overflow from the south pond is directed to the Metropolitan St. Louis Sewer District (MSD) system.

According to the utility map of the park, there are six stormwater outfalls into the Mississippi River between Washington Avenue and Poplar Street:

- The northernmost of these outfalls is a 36-inch reinforced concrete pipe (RCP) storm sewer just north of Washington Avenue that outfalls into the Mississippi River northeast of the North Overlook.
- A 36-inch RCP storm sewer collects runoff from the North Overlook and Arch Parking Garage, running beneath the North Overlook and outfalling into the Mississippi River.
- A 15 inch RCP storm sewer collects runoff from the north railroad cut and a tile subsurface drainage system and flows beneath Leonor K. Sullivan Boulevard, outfalling into the Mississippi River.
- A 15-inch RCP storm sewer collects runoff from the Grand Staircase and east slopes.

This storm sewer also flows beneath Leonor K. Sullivan Boulevard and outfalls into the Mississippi River.

- South of the Gateway Arch, a large 54-inch storm sewer runs across the park beneath the south reflecting pond, the south railroad cut, and Leonor K. Sullivan Boulevard, outfalling into the Mississippi River.
- On the south side of the park, a 36-inch storm sewer outlet from the south reflecting pond runs southeast to a junction with a main storm sewer line beneath the eastbound lanes of Poplar Street outside the park boundary. This large storm sewer also collects runoff from the area around the railroad tunnel and the South Overlook.

In addition to the active storm sewer lines described above, there are a number of abandoned storm sewer lines shown on the utility map. These inactive lines may be encountered during construction activities at the park. They are assumed to present minimal hazards or interference with construction activities, and are therefore not described in detail in this EA.

Stormwater systems along the Central Riverfront are relatively simple. A large portion of the storm flow south of Poplar Street is allowed to sheet flow from Leonor K. Sullivan Boulevard directly to the levee without being collected or channeled. North of Poplar Street, the storm flow is collected by a system of curb inlets, trench drains, and area drains which connect to storm trunk sewers that discharge directly to the Mississippi River.

**The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year.**



**Figure 30** Flooding along the Central Riverfront within the Floodplain

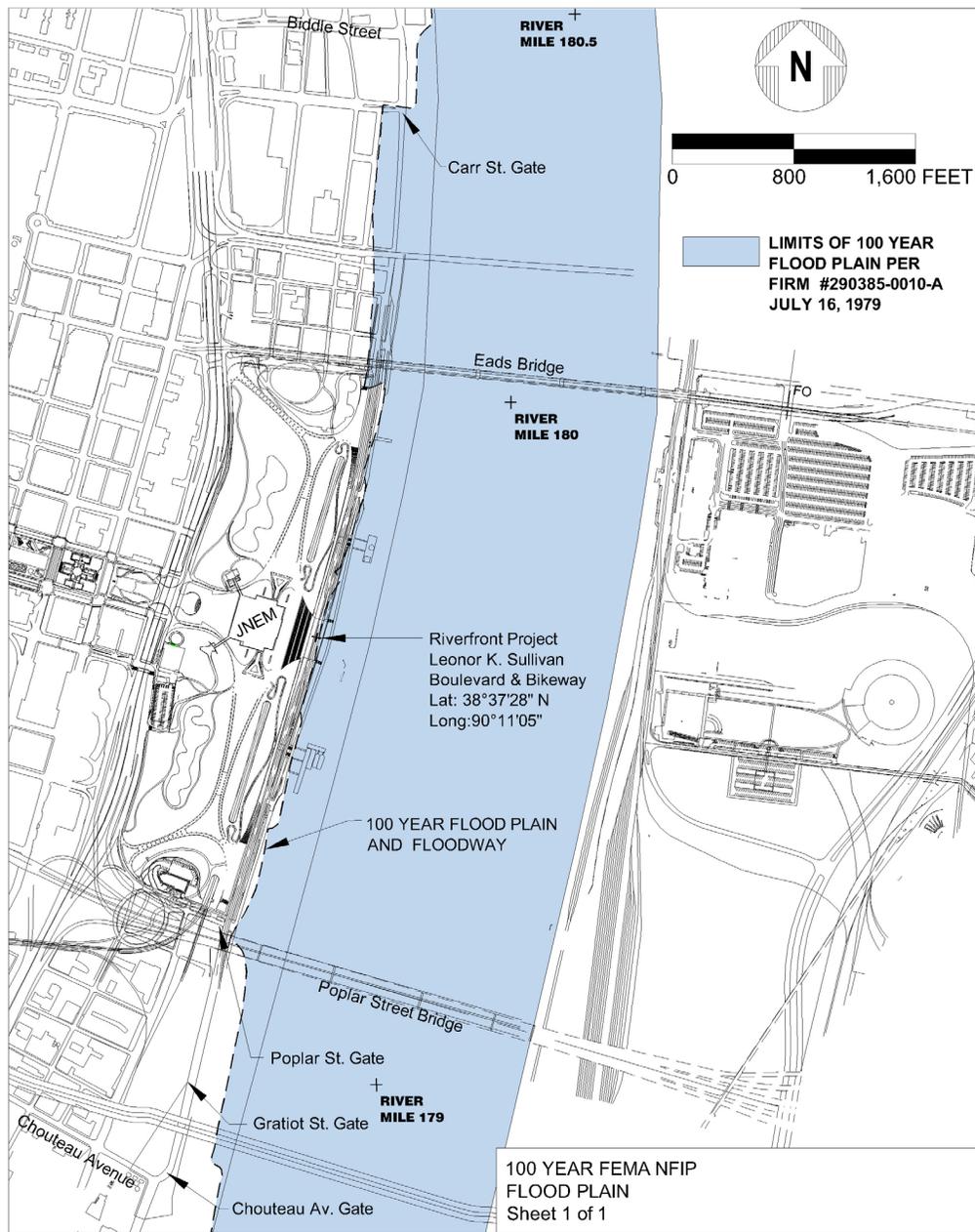
## FLOODPLAINS

Portions of the East Slopes and the entire Central Riverfront lies within the regulatory Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP) 100-year (1%) Mississippi River floodplain (see Figure 31). The floodway portion of the river is confined by a floodwall/levee system on both the east side of the River (Illinois bank) and the west side of the river (Missouri bank). The floodwall/levee system essentially “squeezes” the floodplain into a relatively narrow floodway.

Floodplains contain flood waters and also provide numerous functions besides storing flood waters. Floodplains can also provide habitat for various flora and fauna especially the islands that are temporarily formed by shifting river sediments. The Mississippi River, below its confluence with the Missouri River, transports a considerable volume of sediment (sand, gravel, silt, etc.). This portion

of the Mississippi River floodplain adjacent to Leonor K. Sullivan Boulevard has been highly industrialized with several river ports / transfer loading facilities located within what is referred to as the St. Louis Harbor. The channel is routinely dredged by commercial sand and gravel suppliers.

The City of St. Louis is a member of the NFIP and must abide by the rules and regulations of this program. It will be necessary to apply for and obtain a Floodplain Development Permit. Because the Central Riverfront improvements propose raising Leonor K. Sullivan Boulevard to reduce the frequency of flooding, it will be necessary to perform a Riverine Hydraulic Analysis of the proposed improvements to assure the city that a “no-rise” to the 100-year base flood elevation will exist after the proposed improvements are constructed. This is typically referred to as a “no-rise” analysis. This analysis will be performed after approximately 40% of the final design is completed.



**Figure 31 Project Area and 100-year Floodplain (Source: Great Rivers Greenway District)**

## VISITOR USE AND EXPERIENCE

### VISITOR OPPORTUNITIES AND USE

The Jefferson National Expansion Memorial receives most of its visitation within its structures: the Visitor Center/Museum complex beneath the Gateway Arch, the ride to the top of the Gateway Arch, and the observation deck at the top of the Gateway Arch. The underground complex includes a lobby, the Museum of Westward Expansion gallery, visitor loading areas for the Gateway Arch’s transportation system, and two theaters that screen films related to the park’s themes. Additions to the visitor center and museum have included the American Indian Peace Medal Exhibit, two museum stores, and a ticket purchasing area. The Old Courthouse includes the Diorama Room and the Competition Room, as well as exhibits on the history of the City of St. Louis and a museum store.

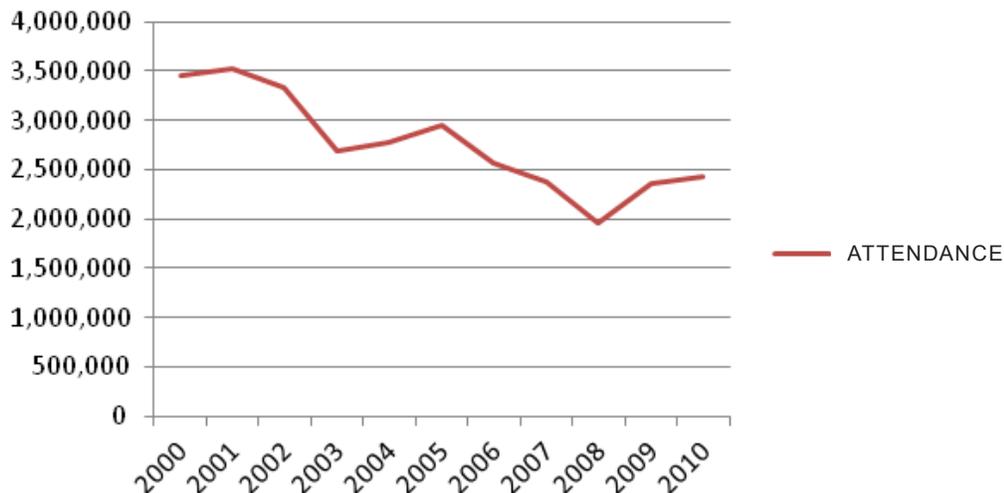
Between the years of 2000 and 2010, an estimated 2.7 million people visited the park annually, including individuals using the site only for the parking garage (non-recreational visits) and special event attendance. Excluding those uses, the park averaged 1.9 million

YEAR	ATTENDANCE
2000	3,458,956
2001	3,532,524
2002	3,333,454
2003	2,685,219
2004	2,779,350
2005	2,944,976
2006	2,572,072
2007	2,385,387
2008	1,954,810
2009	2,360,109
2010	2,436,110

**Table 3 Annual Attendance, Jefferson National Expansion Memorial**  
 Source: National Park Service Public Use Statistics Office (NPS 2011d)

visitors per year. During the same time period, an average of 1.7 million people visited the Visitor Center underneath the Arch, an average of 1.1 million people visited the Museum of Westward Expansion, and an average of 99,000 people visited the Old Courthouse (NPS 2011b). Table 3 below provides estimated annual visitation to the park from 2000 to 2010.

**Table 4 Graph of Annual Attendance, Jefferson National Expansion Memorial (Source: NPS)**



Results of two surveys conducted by Metro, one in 2003-2004 and one in 2006-2007, indicate that: two-thirds of visitors reside within 500 miles of the park; most visitors return within 11 years for another visit; the average park visit lasts just over two hours; and, at least 19 percent of visitors cited the Gateway Arch experience, consisting of the tram ride and the view from the top of the Gateway Arch, as the primary reason for visiting. Further information about these surveys is discussed in the Chapter 3 of the GMP on page 3-34 (NPS 2009).

Visitor contact stations currently include the visitor information desk in the lobby of the George B. Hartzog Visitor Center underneath the Arch; ticket takers in front of the two theaters; interpreters stationed at the entrance of the Museum of Westward Expansion and roving within the museum; and interpreters stationed at the top of the Gateway Arch and in the Old Courthouse (NPS 2009). Other facilities at the park include exhibit galleries in the Old Courthouse, and museum shops. The park also offers many educational programs to groups, ranging from pre-school to high school, college, and senior citizens.

The Museum of Westward Expansion commemorates the people and events of the 19th century American westward movement through artifacts, quotations, photographs, and animatronic figures. The Museum's collection focuses on the history of westward expansion, St. Louis history, and Gateway Arch construction. The collection includes clothing, tools, equipment, weapons, household goods, personal items, and transportation devices that are representative of those used in exploring and settling the Trans-Mississippian West between 1804 and 1890 (NPS 2009).

The park grounds are used by visitors on their way to the Gateway Arch, as well as by local downtown workers and residents who utilize the park as an urban green space. The park is used by visitors as well as downtown residents and workers for picnics, lunch hours, and passive and active recreation. Some recreational activities are permitted in the park, as long as they do not conflict with the stated memorial purpose of the park or its

setting. Recreational activities include walking, jogging, biking, photography, watching the river, sitting, reading, and informal recreation such as Frisbee tossing. Organized sporting events are not permitted. St. Louis residents and visitors also take advantage of interpretive programming at the park such as the Night at the Museum program, the Family Junior Ranger programs, ranger led bike tours, Arch grounds walking tours, and seasonal programming. The park annually hosts a series of special events including Fair St. Louis, African American Heritage Month, Fourth of July celebrations, Constitution Day, Victorian Holidays and St. Louis Traditions, and others.

The Central Riverfront provides a place for visitors and downtown workers to experience an intimate encounter with the Mississippi River while experiencing a variety of passive and active recreational opportunities. An existing promenade on the east side of Leonor K. Sullivan Boulevard features concrete paved sidewalks, street trees, benches, and outlooks for river viewing. Opportunities for food concessions, horse-drawn carriage rides, and bicycle rentals are available. The Central Riverfront also provides a glimpse into the character of a commercial riverfront through its available riverboats cruises and excursion boat tours. Replica 19th-century paddle-wheel boats, Tom Sawyer and Becky Thatcher, located on the Central Riverfront include cruise narration which offers a historical overview of the area and the role this working river still plays today.

## **PEDESTRIAN AND BICYCLE CIRCULATION**

Sidewalks of varying widths and conditions are located along the streets of downtown St. Louis. As is typical in a downtown urban setting, many trips can be made on foot within the vicinity of the park. One-quarter to one-half mile (a five- to ten-minute walk) is typically considered to be a comfortable walking distance.

While the Gateway Arch is within one-quarter mile of both the Arch Parking Garage and the Old Courthouse, the south end of the park is further than one-half mile from either of



**Figure 32 Transportation and Circulation Existing Conditions**

these facilities. This contributes to its relative isolation. The park is largely cut off from the rest of downtown St. Louis by Interstate 70, impeding pedestrian access from the downtown streets south of Walnut Street.

The largest impediment to pedestrian access is the need to cross Memorial Drive at the Walnut, Market, Pine, and Chestnut Street bridges. Recent pedestrian-oriented improvements include accessible, paved crosswalks across Memorial Drive. Memorial Drive is four lanes with a pedestrian island in the middle. While waiting at the pedestrian islands, high-speed freeway traffic is visible and audible in the I-70 trench below (Figure 33). These conditions and vehicles converging from multiple directions, however, continue to create disorienting pedestrian conditions between the Old Courthouse and the Gateway Arch.

Within the park, there are approximately five miles of exposed-aggregate concrete sidewalks, as well as more than two miles of concrete sidewalks around the perimeter (NPS 1996a).

While the Grand Staircase leading from the park to the riverfront is in good condition, there is currently no means of reaching the riverfront directly from the Gateway Arch for persons with mobility impairments. In addition, the concrete north and south staircases that reach from the North and South Overlooks down to Leonor K. Sullivan Boulevard have some surface deterioration and cracking.

With few designated on-street bicycle lanes in downtown St. Louis, most cyclists must share the roadway with automobiles. The park is a destination for bicyclists, primarily via the Riverfront Trail, an off-road facility that is part of the River Ring Greenways system. This trail links the Mississippi riverfront with the Greater St. Louis region. The park is a hub of this trail system and its planned expansion.

The Riverfront Trail runs along the edge of park grounds along The Central Riverfront. This segment of the trail shares the street lanes with vehicular traffic. Poplar Street, Memorial Drive, and Washington Avenue are



**Figure 33 Pedestrian Bridge over I-70 across Memorial Drive**

also designated as part of the regional bikeway network, albeit via shared lanes as well. Other streets in downtown St. Louis, including Chestnut, are designated as bike routes, though without dedicated bike lanes. Only Olive Street, west of 20th Street, has dedicated bicycle lanes in downtown St. Louis.

The park grounds permit bicycle use, though facilities such as bike racks are limited. The NPS partner Metro rents bicycles, including “quadcycles,” from a location at the base of the Grand Staircase along Leonor K. Sullivan Boulevard.

## **PARKING**

While parking is ancillary to the experience of the Gateway Arch and park grounds, the location and perceived ease of access to it helps shape the visitor experience. For the purposes of this analysis, the parking facilities have been divided into those parking locations within the park grounds, and those parking facilities outside of the park.

### **Arch Parking Garage**

The Arch Parking Garage on Washington Avenue was constructed in 1983, and has

a capacity of 1,208 vehicles on three levels, with two levels below-grade and the top level entrance at the same grade as the walks in the adjacent park. A result in part of its design (intended to retain a low profile and avoid visibility from within the park), a perceived deficiency with the current garage is its maximum height of seven feet, which precludes bus, RV, and oversized vehicle parking. The garage is a primary access point for visitors to the Gateway Arch, with the approximately one-quarter mile walk to the Arch remaining one of the most actively used paths within the park. The garage is also used by non-park visitors, including people who are accessing the riverfront and Laclede’s Landing, as well as NPS and Metro employees.

### **Old Cathedral Parking Garage**

The surface parking lot at the Old Cathedral, with approximately 87 spaces, was constructed in 1961 (NPS 1996a). While the Old Cathedral is not within the park boundary, the associated parking lot is. An effort on behalf of the Archdiocese of St. Louis to expand the lot was turned down by the NPS in 1969, due to its potential impact on the park. The existing lot was resurfaced and redesigned in 1994. A bus drop-off is located along Memorial Drive

adjacent to the Old Cathedral Parking lot. The pedestrian path from the Old Cathedral Parking lot provides the shortest barrier free accessible route to the Gateway Arch and the Visitor Center/Museum, making it a desirable drop-off and pick-up location for visitors.

### **Maintenance Parking Facility**

The maintenance facility is located at the south end of the park. The current facility was built in 2002, and includes a small parking lot for use by NPS employees and visitors to the facility. The lot was expanded from five to ten spaces in 2007.

### **On-Street Parking Spaces (Within the Park Boundary)**

Since the official boundary of Jefferson National Expansion Memorial extends to the middle of Market and Chestnut Streets, the area used for on-street parallel parking spaces on the north side of Market Street, adjacent to Luther Ely Smith Square, falls within the park boundary. These 10 spaces are illegal parking areas, as the street is clearly marked as a no parking zone, yet they continue to be used despite frequent issuances of tickets by the City of St. Louis Parking Violations Bureau. The other streets around the park (Memorial Drive, Washington Avenue, Poplar Street, and Leonor K. Sullivan Boulevard) do not have on-street parking spaces, though at times illegal on-street parking occurs along Leonor K. Sullivan Boulevard, particularly in times of flooding, when the adjacent levee parking is underwater.

### **Off-Site Parking Facilities**

Visitors have numerous options for parking off-site within one-quarter mile of the park and Central Riverfront. Given the park's location in downtown St. Louis, there are many options including on-street parking, parking along the levee, nearby private and public parking garages, and surface lots.

For the purposes of this plan, only those parking facilities located within one-quarter mile of the park are considered. It is assumed that most visitors arriving via private automobile would typically park within

one-quarter mile (a five-minute walk) of the park. Some portions of the park, such as the Old Courthouse and the southern end of the park grounds, are closer to off-site parking facilities than they are to the Arch Parking Garage or the Old Cathedral Parking lot.

### **Parking Garages and Lots**

There are approximately 46,000 parking spaces located within downtown St. Louis, with 2,700 of them on-street spaces (Downtown St. Louis Partnership 2008). Of these, many off-street spaces are within one-quarter mile of the park boundary. The majority of these facilities is utilized by long-term users, but most have space available for public use as well. According to the Arch Parking Alternatives Study Final Report, prepared for Metro in 2012, there are 28,440 public parking spaces, with an estimated 13,000 available to park visitors on a daily basis, within the downtown area identified in the parking study (Carl Walker 2012).

### **Bus and RV Parking**

In addition to the bus drop-off location alongside the Old Cathedral Parking lot, Leonor K. Sullivan Boulevard, along the east border of the park, is also used for bus loading and unloading. Bus and oversize vehicle parking is currently accommodated along South Leonor K. Sullivan Boulevard/South Wharf Street south of the Poplar Street Bridge.

## **ACCESSIBILITY**

NPS Director's Order 42 defines architectural accessibility as "the design, construction and/or alteration of a building or facility that is in compliance with officially sanctioned design standards, and that can be entered, and used by individuals with a disability." Architectural accessibility is used in conjunction with the idea of program accessibility, a concept used to ensure that "the programs, activities and opportunities provided to visitors and/or employees will be provided . . . in such a way that individuals with disabilities are not excluded from, nor denied the benefits of, that program or activity."

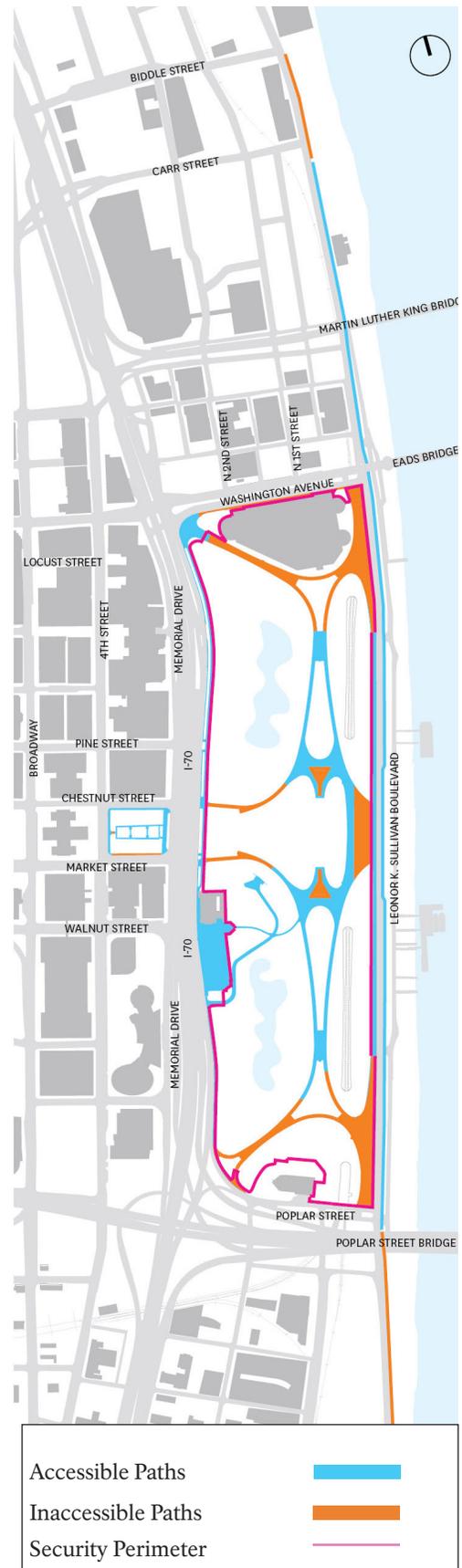
Circulation within and around the park includes both accessible and inaccessible routes and pathways. The area of the park that is the least accessible is the East Slopes between the Gateway Arch and the riverfront. However, the park has implemented many measures to ensure that facilities and programs meet architectural and program accessibility standards. Accessible architectural and program experiences are provided through physical modifications to the park, as well as through self-activated video programs, large-print brochures, and telecommunications device for the deaf (TDD) equipment, and wheelchairs on request.

The most extensive physical modification to accommodate barrier-free access was completed in 1994, when the Old Cathedral Parking lot was redesigned and reconstructed to provide a bus pull-off along Memorial Drive. This enables drivers to drop off or pick up passengers close to the Gateway Arch's south leg, near the Old Cathedral. Accessible parking for visitors is also provided at the Arch Parking Garage. The most common visitor complaint about accessibility at the park is the distance between the Arch Parking Garage and the Gateway Arch (approximately 1,100 feet).

To provide more accessibility at the Old Courthouse, a wheelchair lift was installed in the southwest courtyard in 2007 and replaced in 2012. This is the only courtyard that may be accessed by the public. The wheelchair lift allows access to the first floor and galleries of the Old Courthouse, which contains exhibits and visitor information. The second floor of the courthouse is not accessible as it can only be reached via a staircase.

The visitor center beneath the Gateway Arch is accessed via ramps with an eight percent slope at both the south and north legs. Although the ramps fall within the Architectural Barriers Act Accessibility Standard (ABAAS) requirements for steepness of grade, they exceed the

**Figure 34 Accessible Walkways Existing Conditions** (Source: MVVA)



acceptable length at this grade. In addition, physically challenged visitors who do not have a problem conquering the ramps may have difficulty opening the heavy glass doors once they reach the visitor center entrances.

Circulation along the Central Riverfront includes both accessible and inaccessible routes and walkways. The sidewalks along the west side of Leonor K. Sullivan Boulevard are generally compliant with current ADA standards. However, there are no ADA compliant connections between this sidewalk and the paths and walkways at the top of the East Slopes of the Arch grounds. Sidewalks along the east side of Leonor K. Sullivan Boulevard between Poplar Street and Washington Avenue do not provide continuous barrier-free access.

Additionally, there are no accessible routes along the Central Riverfront south of Poplar Street, or north of Carr Street. Access from Leonor K. Sullivan Boulevard to the levee is provided via concrete switch-back ramps at two locations near the south and north legs of the Arch, respectively. These ramps are not compliant with current ADA standards, and ADA compliant access along the levee is not provided. Figure 34 indicates the walkways that are accessible and areas of the park and the Central Riverfront that are inaccessible.

## SOCIOECONOMICS

Jefferson National Expansion Memorial is located within the urban area of St. Louis, Missouri. The park, a major, iconic tourist attraction, draws millions of visitors each year. As individuals and families travel to the area they provide economic stimulus through their local spending. Given the importance of the park as a regional attraction, the influence area for social and economic consideration has been defined as the City of St. Louis, where most of the park visitor spending is likely to occur. The project team collected data for socioeconomic baseline conditions for the City of St. Louis. Data was also collected for St. Louis County, where available, to provide a broader regional perspective.

## ECONOMIC CONTRIBUTIONS OF THE PARK

From 2000 to 2010, the park averaged 2.7 million visitors per year. This includes individuals coming to the site solely to use the parking facilities (non-recreation visits) and those that come to the site during special events (e.g. Fair of St. Louis). When these two types of uses are excluded, the park averaged 1.9 million visitors per year over this period (NPS 2011b). Table 3.1 on page 3-43 of the GMP provides a breakdown of the annual estimated visitation to the park from 1998 to 2007.

**Figure 35** Visitors Gathering on the Grand Staircase and Central Riverfront during a Special Event



The economic contribution of the park during 2010 was estimated by the NPS Money Generation Model Version 2, developed by Michigan State University (Stynes 2011a and 2011b). According to this analysis, the park hosted 2.44 million recreational visitors who spent \$98.44 million in the area (Stynes 2011c). This spending generates additional economic activity in the form of sales, income, and jobs through businesses that provide goods and services to visitors. The jobs cited include full-time and part-time jobs with seasonal positions adjusted to an annual basis (Stynes 2011a).

Local and non-local visitor spending is included to capture all economic activity associated with park visits in the local area. Estimates of the economic impact of visitor spending in the local area generally exclude spending by local residents, as it is assumed that if park opportunities were unavailable, local residents would still spend the money on other local activities, while visitors from outside the region would not make the trip. The economic impacts generated by visitor spending should be interpreted as the expected loss in economic activity within the region if the park were closed (Stynes 2011a). In 2010, the economic impacts of non-local visitor spending equaled \$86.62 million in sales, \$37.4 million in labor income, \$60.98 million in value added and 1,309 jobs (Stynes 2011c). The economic sectors most directly affected by the economic contribution of the park are lodging, and restaurants and bars (Stynes 2011b). In 2009, the park directly employed 130 Full Time Equivalent (FTE) employees and park partners, Metro and Jefferson National Parks Association, employed 110 FTE employees (NPS 2009). These jobs generated additional labor income in the local area.

## **SOCIAL CONTRIBUTIONS OF THE PARK**

As discussed in the Visitor Use and Experience section of this EA, the park serves as an open green space in the urbanized area of downtown St. Louis. The park is a resource for downtown residents and workers, as well as out of town visitors, as access to parks and open spaces increases the livability of an area by providing space for outdoor active and passive recreation. The pedestrian connections

to the park that are available from downtown to access the open space can be difficult or unpleasant to navigate, as discussed above in the Pedestrian and Bicycle Circulation section of Visitor Use and Experience.

## **EMPLOYMENT AND ECONOMIC WELFARE**

The 2006-2010 American Community Survey 5-Year Estimates list the top five industries in the City of St. Louis as: (1) educational services, and health care and social assistance; (2) arts, entertainment, and recreation, and accommodation and food services; (3) professional, scientific, and management, and administrative and waste management services; (4) retail trade; and (5) manufacturing. These occupation sectors make up approximately 69 percent of the civilian employed population age 16 years and over residing in the city (U.S. Census Bureau 2010).

Within St. Louis County, the top five industries for the same time period were identified as: (1) educational services, and health care and social assistance; (2) professional, scientific, and management, and administrative and waste management services; (3) retail trade; (4) manufacturing; and (5) finance and insurance, and real estate and rental and leasing. These occupation sectors make up approximately 67 percent of the civilian employed population age 16 years and over residing in the county (U.S. Census Bureau 2010).

The difference in economic structure of the City of St. Louis and St. Louis County is shown in the data reflecting employment by industry. Both the city and the county have a strong concentration in the education and health industry sector, with a higher percentage of jobs related to health care and social assistance than to education. The City of St. Louis shows a stronger concentration in arts, entertainment, and recreation, and accommodation and food services than the county. Within the arts and entertainment industry sector in the city, the largest concentration of jobs is in accommodation and food services. St. Louis County shows a stronger concentration in professional services, finance and real estate, and trade and manufacturing.

Unemployment over the last ten years in the St. Louis metro area has tended to follow the trend of the national economy; however, the city averages a higher unemployment rate than the county. In the 2006-2010 American Community Survey 3-Year Estimates, the unemployment rate in the City of St. Louis was approximately 12.7 percent. In St. Louis County it was estimated at 7 percent (U.S. Census Bureau 2010a). The Bureau of Labor Statistics estimated that the seasonally adjusted unemployment rate in the St. Louis, MO-IL Metropolitan Statistical Area (MSA), which includes the City of St. Louis and St. Louis County, was 10 percent in 2010 (BLS 2011a). The principal cities in the St. Louis, MO-IL MSA are St. Louis and St. Charles, Missouri. The surrounding counties on both sides of the Mississippi River are also included in the MSA. In comparison, in 2010 the annual average unemployment rate for Missouri was estimated at 9.5 percent, as compared to the national rate of 9.6 percent (BLS 2011b).

The labor force employed within the city limits is drawn from both residents and non-residents. In 2009, approximately 26 percent of the labor force employed within the City of St. Louis also resided in the city, while 56 percent of the labor force living in the City of St. Louis was employed outside of the city. Approximately 74 percent of the labor force employed within the City of St. Louis resided outside of the city and commuted in for employment purposes (U.S. Census Bureau 2009).

Another perspective on economic welfare is provided by looking at median household income and poverty rates. The City of St. Louis has a lower median household income than St. Louis County, according to the 2006-2010 American Community Survey 5-year Estimates. Median household income levels within the city were 58 percent of those in the county. The City of St. Louis also reported poverty levels that are much higher than the county and the U.S. as a whole (U.S. Census Bureau 2010a).

## ECONOMIC CONTRIBUTIONS OF THE CENTRAL RIVERFRONT

An economic impact study of the effect of ongoing operations along Leonor K. Sullivan Boulevard and their contributions to the local economy was undertaken by the Great Rivers Greenway District in 2012 (GRG 2012). The study included the portions of Leonor K. Sullivan Boulevard along Laclede's Landing, the park, and Chouteau's Landing.

The study estimated that there are approximately 397,900 local and non-local visitors to Leonor K. Sullivan Boulevard per year. Of those visitors, approximately 258,600 are estimated to be non-local visitors. The overall annual economic impact of visitor spending along Leonor K. Sullivan Boulevard on the city's economy is estimated to be \$12.2 million. This includes direct spending, the estimated multiplier effect of the spending, earnings for jobs along Leonor K. Sullivan Boulevard, and multiplier jobs for other city residents. The total number of jobs related to the economic activity along Leonor K. Sullivan Boulevard is estimated at 46, with 11 jobs directly related to Leonor K. Sullivan Boulevard. In addition, the total economic activity generated by the City of St. Louis' operations and maintenance of Leonor K. Sullivan Boulevard is approximately \$193,000 annually and supports 2.15 jobs (GRG 2012).

## **OPERATIONS AND MANAGEMENT**

### **PARK OPERATIONS AND MANAGEMENT**

The park is administered by the Superintendent headquartered in the Old Courthouse. The Superintendent's office includes a Deputy Superintendent, Management Assistant, and Secretary. The Management Assistant is responsible for all Special Use Permits, Filming Permits, and other commercial uses of the park.

There are 130 FTE at the park including administrative staff, interpretive staff, facilities and grounds management and maintenance, and law enforcement. Partner groups provide staff which account for an additional 110 FTE (NPS 2009).

#### **Ranger Activities Division**

This division is responsible for 24-hour, 365-day law enforcement and physical security throughout the park grounds and the Gateway Arch. The park has concurrent jurisdiction and commissioned rangers enforce state and federal laws and regulations intended to safeguard visitors and park resources. In addition to law enforcement, this division is responsible for dispatch and emergency medical services throughout the park. Rangers make routine park visitor contacts to ensure that park regulations are understood and being met, to check for safety and resource protection violations, and to respond to or direct visitor inquiries to appropriate park staff. As a designated icon park, the Gateway Arch's physical security is of paramount importance. All visitors to the Gateway Arch are screened via x-ray and magnetometer at one of the two entrances prior to entering the facility.

#### **Museum Services and Interpretation Division**

This division includes an Education Department, Exhibits Department, Theater and Audio-Visual Department, Curatorial Department, and Interpretation Department.

The Education Department plans, promotes and presents education programs, events and materials about National Park themes, and resources at the Gateway Arch and Old Courthouse for families, school and scout groups, and educators. The Exhibits Department is responsible for planning and building temporary exhibits on park themes, and routine maintenance and cleaning of museum exhibits. The Theater and Audio-Visual Department handles the operation and maintenance of the park's two theaters and provides the park with AV needs such as photographs and videos of events, programs, training, and personnel. The Curatorial Department manages the park's library, provides assistance to researchers, and catalogs and preserves the park's archival holdings. The Interpretation staff is responsible for staffing public contact points in the park, assisting visitors with directions, answering questions, and providing background and historical information about the park. The staff also plan and implement public programs and events.

#### **Administration Division**

The Division of Administration is responsible for the park's budget and financial accounting, property management, payroll, human resource management, contracting and procurement, mail services, filing, and management of the computer system. This division is also responsible for concession management and the park's telephone system.

#### **Maintenance Division**

The Maintenance Division consists of the Grounds Section, Custodial Services, Building Services, and Gateway Arch Transportation System. The Grounds Section is responsible for caring for the unique, man-made environment on the park grounds. Staff has an extensive knowledge not only of horticulture, but several other disciplines as well, and manages vegetation based on NPS policies pertaining to Integrated Pest Management (IPM). For more information on tree maintenance practices on the park grounds, refer to the Jefferson National Expansion Memorial Landscape Preservation Maintenance Plan (NPS 2010b). The Landscape Preservation Maintenance Plan, completed as a sequel to the 2010 CLR,

provides detailed guidance on best practices for maintaining the historic character of the park, and for preventing damage to vegetation resources due to construction or other activities.

Duties of the maintenance division include snow removal, mowing, turf maintenance, pest management, tree maintenance, irrigation, landscaping and equipment maintenance, snow removal, and emptying litter containers. Custodial Services is responsible for the cleanliness of the park buildings including the museum and exhibit areas in the Old Courthouse. Building Services is responsible for maintaining the complex heating and air conditioning units at the park. The Gateway Arch Transportation System Department is a group of skilled technicians responsible for maintaining and repairing the Gateway Arch tram system. In addition to work on the trams, these employees perform extensive work on electrical and wiring systems in the park.

## **PARK PARTNERS**

The park has working relationships with a variety of groups and organizations in order to meet operational, interpretive, and programmatic goals, and will continue to build on these partnerships. The park is committed to strengthening relationships with universities, schools, institutes, and organizations as well as local, state, and federal agencies to accomplish a variety of operational needs. In particular, the park partners described below contribute to the daily operation of the park.

### **Metro Business Enterprises**

Metro (also known as the Bi-State Development Agency) was established in 1949 as an interstate compact between Missouri and Illinois and provides public transit for the St. Louis metropolitan region. Metro funded and built the Gateway Arch Transportation System in the 1960s, and continues to administer its operation. Metro also constructed the Arch Parking Garage and continues to operate and maintain the garage. In addition, they collect park fees and fund exhibits and other improvements. A large portion of the fees collected by Metro go towards park operations.

### **Jefferson National Parks Association**

JNPA operates three stores in the park, and a wide variety of projects are funded through their donations including special exhibits and programs. They play a vital role in the park's interpretive effort, with contributions to the museum education program, exhibits, and library and archival staffing.

## **ENERGY REQUIREMENTS AND CONSERVATION/SUSTAINABILITY**

Sustainability can be described as the result achieved by doing things in ways that do not compromise the environment or its capacity to provide for present and future generations. Sustainable practices minimize the short- and long-term environmental impacts activities through resource conservation, recycling, waste minimization, and the use of energy efficient and ecologically responsible materials and techniques. NPS pursues sustainable practices whenever possible in all decisions regarding NPS operations and facilities management.

The buildings and facilities at the park require energy and resources for operations and maintenance. The park's current energy requirements include the electrical and HVAC systems that provide power, heating, and cooling to the Gateway Arch complex of 104,560 square feet, including the underground Visitor Center/Museum; the observation deck at the top of the 630-foot-tall Gateway Arch; and throughout the facility's support rooms and tunnels. The energy needs at the Old Courthouse include electricity and steam heating. Cooling is provided in the Old Courthouse exhibit galleries and second floor offices via electric window air conditioning units.

The park grounds and Arch Parking Garage also require energy and resources for general maintenance and operations. Energy is required for mowing, landscaping, snow removal, and other maintenance activities. Water resources are needed for irrigation of the grounds. The Arch Parking Garage is not fully enclosed and therefore is not climate-controlled. The turf grass at the park is maintained to a very high level, using standard

chemical fertilizers and pesticides. These inputs contribute to the pollution of the ponds, the Metropolitan St. Louis Sewer District (MSD) system, and the Mississippi River. The complex irrigation system overwaters the turf which then leads to faster grass growth which requires increased mowing. Mowing burns fossil fuels and contributes to urban air and noise pollution (NPS 2010b).

### **CENTRAL RIVERFRONT OPERATIONS AND MANAGEMENT**

The Central Riverfront lies within the operational and management authority of the City of St. Louis. The city's Street Department is responsible for maintaining over 1,000 miles of city streets and 600 miles of city alleys. This includes all of the streets along the Central Riverfront. The City of St. Louis Streets Department is also in charge of the city's refuse and recycling programs, traffic signals, street lighting, and street signs, salting and plowing city streets, towing abandoned or damaged cars from the roadways, and for permitting street or mobile vendors.

The floodwall and levee system along the Central Riverfront is a Federal Levee built by the U.S. Army Corps of Engineers, and turned over to the City of St. Louis for operation and maintenance. As such, the Street Department is responsible for all manpower, tools, and equipment necessary to install, remove, and maintain the closure structures on the floodwall along the Central Riverfront. The Street Department also performs and manages all post-flood cleanup operations on Leonor K. Sullivan Boulevard and the levee.

Other entities (e.g., the U.S. Army Corps of Engineers, U.S. Coast Guard) have jurisdictional responsibilities for management of the Mississippi River along the Central Riverfront. However, the operations and management of these organizations would not be affected by the proposed Central Riverfront improvements, and therefore, they are not discussed further in this EA.

**Figure 36 Central Riverfront along the Park**



# 4. Environmental Consequences

Jefferson National Expansion Memorial  
Environmental Assessment for Implementing CityArchRiver Initiative Elements





# Environmental Consequences

This “Environmental Consequences” chapter analyzes both beneficial and adverse impacts that would result from implementing any of the alternatives considered in this EA. This chapter also includes definitions of impact thresholds (e.g., negligible, minor, moderate, and major), methods used to analyze impacts, and the analysis methods used for determining cumulative impacts. As required by the CEQ regulations implementing NEPA, a summary of the environmental consequences for each alternative is provided in Table 2 which can be found in “Chapter 2: Alternatives.” The resource topics presented in this chapter, and the organization of the topics, correspond to the resource discussions contained in “Chapter 3: Affected Environment.”

## GENERAL METHODOLOGY FOR ESTABLISHING IMPACT THRESHOLDS AND MEASURING EFFECTS BY RESOURCE

The following elements were used in the general approach for establishing impact thresholds and/or measuring the effects of the alternatives on each resource category:

- general analysis methods as described in guiding regulations, including the context and duration of environmental effects;
- basic assumptions used to formulate the specific methods used in this analysis;
- thresholds used to define the level of impact resulting from each alternative; and
- methods used to evaluate the cumulative impacts of each alternative in combination with unrelated factors or actions affecting the resources analyzed.

These elements are described in the following sections.

## GENERAL ANALYSIS METHODS

The analysis of impacts follows CEQ guidelines and Director’s Order 12 handbook procedures (NPS 2001) and is based on the underlying goal of providing for long-term protection and conservation of cultural and natural resources while implementing CityArchRiver 2015 Initiative projects. This analysis incorporates the best available literature applicable to the region, setting, and the actions being considered in the alternatives.

As described in Chapter 1, the NPS created an interdisciplinary team to provide important input to the impact analysis. For each resource topic addressed in this chapter, the applicable analysis methods are discussed, including assumptions and impact intensity thresholds.

## IMPACT THRESHOLDS

Impact thresholds provide the reader with an idea of the intensity of a given impact on a specific topic. The intensity is determined primarily by comparing the effect to relevant/appropriate regulations or guidance, scientific literature and research, or best professional judgment. Because intensity varies by impact topic, impact thresholds are provided separately for each topic analyzed in this document. The definitions of these thresholds are provided throughout the analysis for negligible, minor, moderate, and major impacts. In all cases, the impact thresholds are defined for adverse impacts. Beneficial impacts are addressed qualitatively.

Potential impacts of all alternatives are described in terms of type (beneficial or adverse); context; duration (short- or long-term); and intensity (negligible, minor, moderate, major). Definitions of these descriptors include:

**Beneficial:** A positive change in the condition or appearance of the resource or value.

**Adverse:** A change that diminishes or degrades a resource or value, or detracts from its appearance or condition.

**Context:** Context is the environment within which an impact would occur, such as local, parkwide, regional, global, affected interests, society as whole, or any combination of these. Context is variable and depends on the circumstances involved with each impact topic. As such, the impact analysis determines the context, not vice versa.

**Duration:** The duration of the impact is described as short-term or long-term. Duration is variable with each impact topic; therefore, definitions related to each impact topic are provided in the specific impact analysis narrative.

**Intensity:** Because definitions of impact intensity (negligible, minor, moderate, and major) vary by impact topic, intensity thresholds are provided separately for each impact topic analyzed.

## CUMULATIVE IMPACT ANALYSIS METHODOLOGY

The CEQ regulations implementing NEPA require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as the results of the impact of the proposed action added to the impacts of 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). These impacts can be beneficial or adverse. Cumulative impacts are considered for all alternatives, including the no-action alternative.

The analysis of cumulative impacts was accomplished using four steps:

**Step 1—Identify Resources Affected:** Fully identify resources affected by any of the alternatives.

**Step 2—Set Boundaries:** Identify an appropriate spatial and temporal boundary for each resource.

**Step 3—Identify Cumulative Action Scenario:** Determine which past, present, and reasonably foreseeable future actions to include with each resource.

**Step 4—Cumulative Impact Analysis:** Summarize the impacts of these other actions (x) plus the impacts of the proposed action (y) to arrive at the total cumulative impact (z).

## PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

Cumulative impacts were determined by combining the impacts of the alternative being considered with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other past, present, or reasonably foreseeable future projects and plans at the park and within the surrounding area. The projects described below were determined to be potential contributors to cumulative impacts on the affected resources, in conjunction with the potential impacts of the alternatives presented in this document. Table 5 identifies the past, present, and future actions that could result in cumulative impacts to the resources of interest for this plan. The past actions considered in this EA are those that have occurred since the publication of the GMP in 2009. As discussed in chapter 1, this document is tiered from the GMP. The present actions considered are those ongoing at the time this EA was prepared. The future actions considered are those not yet occurring but which are planned, programmed, or scheduled for implementation at the time this EA was prepared.

## Past Actions

**Citygarden.** Centered on the Gateway Mall, Citygarden is a recently constructed public sculpture garden bounded by 8th, 10th, Market, and Chestnut Streets. The land is owned by the City of St. Louis, and the sculptures are owned and maintained by the private nonprofit Gateway Foundation. The garden includes 24 sculptures by internationally renowned artists, including Fernand Leger, Mark di Suvero, and Keith Haring, with the landscape designed by Nelson Byrd Woltz. Citygarden had the potential to impact archeological resources, visitor use and experience, and socioeconomics.

**Cupples Station Ballpark Lofts.** These former warehouses, located west of Busch Stadium, were constructed in the late 1800s and were recently converted into loft condos with commercial/retail space on the first two floors. Renovation plans for other warehouses also include residential, office, and retail space but have not yet been initiated. Cupples Station Ballpark Lofts had the potential to impact socioeconomics.

**Hyatt Regency St. Louis Riverfront.** Renovations to the hotel were completed in 2010, and include a remodeling of all rooms and renovation of the sports bar, event spaces and lobby restaurant. The Hyatt Regency had the potential to impact socioeconomics.

**Old Post Office Plaza.** This public space is used for outdoor events such as weekend markets, film series, music, and theater. It is part of the Old Post Office Square area that includes the restored 1884 US Customs House and Post Office, and retail, residential, and office space. The Old Post Office Plaza project had the potential to impact archeological resources, visitor use and experience, and socioeconomics.

**Federal Reserve Bank of St. Louis.** The existing Federal Reserve Bank office building on Locust Street between North Broadway and 4th Street was renovated, the former Marquette parking garage was remodeled, an existing parking garage was demolished, and an outdoor plaza and a six-story, 100,000-square-foot office addition was constructed. The Federal Reserve Bank had the potential to impact archeological resources and socioeconomics.

## Current Actions

**Old Courthouse renovations and repairs.** The Old Courthouse copper roof was replaced in 2011. Four paintings by Karl Ferdinand Wimar that surround the interior of the rotunda underwent professional cleaning and conservation in 2011 and 2012. Renovation of the stone cornices on the exterior of the building is ongoing, with an expected completion date of December 2012. A life-sized statue of Dred and Harriet Scott was installed in front of the Old Courthouse in June 2012. The following resources could be impacted by the Old Courthouse renovations and repairs: historic buildings, museum collections, soundscape, visitor use and experience, and operations and management.

**Eads Bridge Restoration.** This structural rehabilitation project includes replacement of support steel, paint removal and repainting, and the repair of MetroLink light rail tracks. The project is expected to be completed by fall 2015. The Eads Bridge Restoration has the potential to impact historic buildings and structures, soundscape, visitor use and experience, and socioeconomics.

**The Mercantile Exchange (MX).** The Mercantile Exchange complex is being developed to include a hotel, office buildings, a movie theater, and residential and retail space. This project includes the renovation of the One City Centre office building, St. Louis Centre and The Laurel, and the old Dillard's building. The MX will be a full-service retail, dining, entertainment, arts and culture, and residential district along Washington Avenue. Streetscape improvements are planned to include sidewalk cafes, landscaping, and public art. The development also includes space for the proposed National Blues Museum, for which fundraising and planning is ongoing. The Mercantile Exchange has the potential to impact archeological resources, visitor use and experience, and socioeconomics.

**Mississippi River Bridge.** The I-70 Mississippi River Bridge project will create a new gateway between Illinois and Missouri, providing connections to and throughout St. Louis. It is located one mile north of the Martin Luther King Bridge and is currently under

construction. The four-lane bridge was designed to accommodate construction of a companion bridge in the future. Construction of the bridge will create a partial interchange with existing I-70 near Cass Avenue for local street access. A roadway connection will be constructed between the existing I-55/64/70 Interchange and the new bridge along the I-64 Connector alignment. The following resources could be impacted by the Mississippi River Bridge: archeological resources, soundscape, floodplains, visitor use and experience, and socioeconomics.

### Future Actions

#### **Kiener Plaza and streetscape improvements.**

As part of the CityArchRiver 2015 Initiative, Kiener Plaza is being redesigned to include elements such as a water feature, a children's play area, concessions, and programming. The roadway along Chestnut Street and Market Street from Tenth Street to Memorial Drive would be narrowed and the sidewalk expanded, creating more visual access to the park for pedestrians. New street trees and landscaping would also be added. The design intends to increase the pedestrian activity and connectivity along the Gateway Mall, from Citygarden through to Luther Ely Smith Square and the park grounds. The following resources could be impacted by the Kiener Plaza and streetscape improvements: archeological resources, historic buildings and structures, visitor use and experience, and socioeconomics.

**Construction of the Park Over the Highway structure.** The preferred alternative in MoDOT's EA addressing transportation projects adjacent to the park includes the construction of a structure over the depressed section of I-70, to create the park connection over the highway between Market and Chestnut Streets. The existing Washington Avenue ramps for I-70/I-44 would be reversed, allowing the existing five-leg intersection at Washington Avenue and Memorial Drive to be simplified to a four-way intersection and signalized. The existing bridges at the Chestnut, Market, and Walnut Street overpasses would be removed, replaced with the new single span structure between Chestnut and Market Streets, and a new bridge at Walnut Street. The Pine Street bridge would remain and would be converted to pedestrian use. East of

Memorial Drive, the NPS is considering closing all or portions of Washington Avenue to through traffic and so MoDOT is providing for a slip lane off of I-70 to facilitate vehicular access to the Arch Parking Garage should it remain.

The structure over I-70 would close northbound Memorial Drive to through-traffic from Walnut Street to the new Washington Avenue ramps and southbound Memorial Drive between Chestnut Street and Market Street. Traffic around Luther Ely Smith Square would flow from south to north in a clockwise direction, going one-way west on Market Street, one-way north on North 4th Street and one-way east on Chestnut Street. Bus/car pick-up and drop-off would occur on the north and south sides of Luther Ely Smith Square. The structure over I-70 has the potential to impact cultural landscapes, historic buildings and structures, archeological resources, vegetation, soundscape, visitor use and experience, socioeconomics, and operations and management.

**Visitor Center/Museum roof replacement.** The roof of the Visitor Center/Museum below the Arch (last repaired in the early 1990s) needs to be replaced in order to address leaks. The project is identified by the park as a necessary long-term maintenance project. Installation of the new roof would require the removal of the ground surface above the Visitor Center/Museum roof, directly below the Arch. The existing roof system would be removed and a new roof structure, waterproofing, and drainage installed. The lawn would then be re-graded and seeded to return it to its existing condition. The following resources could be impacted by the Visitor Center/Museum roof replacement: cultural landscapes, museum collections, vegetation, soundscape, water resources, visitor use and experience, and operations and management.

#### **Repair North and South Overlook stairs.**

The North and South Overlook stairs need to be repaired to eliminate tripping hazards. The project is identified by the park as a necessary long-term maintenance project. The project would remove cracked and loose surface material to solid substrate and install a new stair system. Construction would be completed at one staircase before construction at the other staircase begins to facilitate visitor

access between the park and the riverfront. The demolition and disposal of the existing step systems at the overlook stairways and the repair of the stairs would follow the intent of the Saarinen site design. The adjacent area would be re-vegetated where any damage occurs during the construction process. The repair of the north and South Overlook Stairs has the potential to impact historic buildings and structures, cultural landscapes, vegetation, soundscape, water resources, visitor use and experience, and operations and management.

#### **Emerald Ash Borer Environmental**

**Assessment.** The Rosehill ash trees in the park, including those that line the Processional Walk, are monitored for the emerald ash borer. Once they are detected to be threatened by the emerald ash borer, the ash trees would be replaced in phases with a species selected by the NPS in accordance with the approved EAB EA (NPS 201b). The EAB EA has the potential to impact soundscape, water resources, and socioeconomic resources. The impacts of the Rosehill ash tree replacement on park vegetation was documented in the approved EAB EA.

#### **Metropolitan St. Louis Sewer District**

**Improvements.** The Metropolitan St. Louis Sewer District (MSD) combined sewer systems throughout the project area are part of a larger regional system that collects and treats domestic, commercial and industrial wastewater from a population of approximately 1.4 million in the City of St. Louis and nearly all of St. Louis County. The system covers more than 525 square miles, and includes seven wastewater treatment plants, 294 pumping stations and more than 9,630 miles of sewer lines, making it the fourth largest sewer system in the United States.

In response to a settlement reached between the United States, the Missouri Coalition for the Environment Foundation and MSD, MSD has agreed to make extensive improvements to its sewer systems and treatment plants, at an estimated cost of \$4.7 billion over the next 23 years, to eliminate illegal overflows of untreated raw sewage, including basement backups, and to reduce pollution levels in urban rivers and streams.

MSD will install a variety of pollution controls, including the construction of three large storage tunnels, and expand capacity at two treatment plants. These controls and similar controls that MSD has already implemented will result in the reduction of almost 13 billion gallons per year of overflows into nearby streams and rivers.

MSD will also develop and implement a comprehensive plan to eliminate more than 200 illegal discharge points within its sanitary sewer system as well as comprehensive and proactive cleaning, maintenance and emergency response programs to improve sewer system performance and to eliminate overflows.

MSD will also substantially advance the use of large scale green infrastructure projects to control wet weather sewer overflows by investing at least \$100 million in an innovative green infrastructure program. Green infrastructure involves the use of properties to store, infiltrate and evaporate stormwater to prevent it from getting into the combined sewer system. Examples of potential green infrastructure projects include green roofs, bioretention, green streets, rain barrels, rain gardens and permeable pavement (US EPA 2011). The Metropolitan St. Louis Sewer District Improvements has the potential to impact water resources.

**Poplar Street Bridge Improvements.** The project would remove the eastbound ramp from I-70 to the Poplar Street Bridge and provide a two-lane onramp to the Poplar Street Bridge from northbound I-55 as well as widen the eastbound section of the Poplar Street Bridge to add a third eastbound I-64 lane over the bridge. These improvements would help to accommodate eastbound traffic accessing Illinois communities south of I-64 and ease congestion on the eastbound lanes of the Poplar Street Bridge and would occur after completion of the Mississippi River Bridge construction. The Poplar Street Bridge Improvements have the potential to impact transportation resources.

Table 5 Cumulative Action Scenario

Impact Topic	Study Area	Past Actions	Current Actions	Future Actions
Historic Buildings, Structures, Sites, Objects, and Districts; and Cultural Landscapes	The cultural resources impact area as defined in this EA is depicted in Figure 23 of the Affected Environment Section.	NA	Old Courthouse renovations and repairs; Eads Bridge Restoration	Construction of Park Over the Highway structure; Kiener Plaza; Visitor Center/ Museum roof replacement; Repair North and South Overlook stairs; Poplar Street Bridge improvements
Archeological Resources	Historic downtown St. Louis	Citygarden; Old Post Office Plaza; Federal Reserve Bank of St. Louis	The Mercantile Exchange; Mississippi River Bridge	Kiener Plaza; Construction of Park Over the Highway structure; Poplar Street Bridge improvements
Museum Collections	Park boundary	NA	Old Courthouse renovations and repairs	Visitor Center/ Museum roof replacement
Vegetation	Park boundary and Central Riverfront	NA	NA	Visitor Center/ Museum roof replacement; Repair North and South Overlook stairs; Construction of Park Over the Highway structure
Soundscape	Park boundary and Central Riverfront	NA	Old Courthouse renovations and repairs; Eads Bridge Restoration; Mississippi River Bridge	Construction of Park Over the Highway structure; Visitor Center/ Museum roof replacement; Emerald Ash Borer Environmental Assessment; Repair North and South Overlook stairs; Poplar Street Bridge improvements
Floodplains	Central riverfront	NA	Mississippi River Bridge	NA

Impact Topic	Study Area	Past Actions	Current Actions	Future Actions
Water Resources	Park boundary, Central Riverfront, and the Mississippi River adjacent to the park	NA	NA	Visitor Center/ Museum roof replacement; Repair North and South Overlook stairs; Emerald Ash Borer Environmental Assessment; Construction of Park Over the Highway structure; Metropolitan St. Louis Sewer District Improvements
Visitor Use and Experience	Park boundary, Central Riverfront, downtown St. Louis area adjacent to the park	Citygarden; Old Post Office Plaza; Eads Bridge Restoration	Old Courthouse renovations and repairs; Mississippi River Bridge; The Mercantile Exchange	Visitor Center/ Museum roof replacement; Repair North and South Overlook stairs; Kiener Plaza and streetscape improvements; Construction of Park Over the Highway structure; Poplar Street Bridge improvements
Socioeconomics	Park boundary, Central Riverfront, downtown St. Louis area adjacent to the park	Citygarden; Cupples Station Ballpark Lofts; Hyatt Regency St. Louis Riverfront; Federal Reserve Bank of St. Louis; Old Post Office Plaza; Eads Bridge Restoration	Old Courthouse renovations and repairs; The Mercantile Exchange; Mississippi River Bridge	Visitor Center/ Museum roof replacement; Repair North and South Overlook stairs; Emerald Ash Borer Environmental Assessment; Kiener Plaza and streetscape improvements; Park Over the Highway structure; Poplar Street Bridge improvements
Operations and Management	Park boundary	NA	Old Courthouse renovations and repairs	Visitor Center/ Museum roof replacement; Repair North and South Overlook stairs; Park Over the Highway structure

## CULTURAL RESOURCES

### METHODOLOGY AND ASSUMPTIONS FOR ASSESSING IMPACTS

In this environmental assessment impacts to cultural resources are evaluated consistent with the CEQ regulations implementing NEPA by (1) determining the cultural resources impact area; (2) identifying cultural resources present in this area that are either listed in, or eligible to be listed in, the National Register of Historic Places; (3) evaluating the type, context, duration, and intensity of impacts to National Register eligible or listed cultural resources; and (4) considering ways to avoid, minimize or mitigate adverse effects. These impact analyses are not intended, however, to comply with the requirements of Section 106 of the National Historic Preservation Act (a separate consultation process for compliance with Section 106 has been initiated; see chapter 5 for additional details).

CEQ regulations and the National Park Service's Director's Order 12 also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only and does not suggest that an adverse effect under Section 106 of the National Historic Preservation Act has been avoided. Cultural resources are non-renewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under Section 106 may be mitigated, the effect remains adverse.

The NPS guidance for evaluating impacts (DO-12: Conservation Planning, Environmental Impact Analysis, and Decision Making; NPS 2001) requires that impact assessment be scientific, accurate, and quantified to the extent possible. For cultural resources, it is seldom possible to measure

impacts in quantifiable terms; therefore, impact thresholds must rely heavily on the professional judgment of resource experts.

### HISTORIC BUILDINGS, STRUCTURES, SITES, OBJECTS, AND DISTRICTS PARKWIDE STRATEGIES

#### Cultural Resources Impact Area

The cultural resources impact area encompasses the park boundaries, the Central Riverfront, and historic buildings, structures, sites, objects, districts in the immediate vicinity of the project area that are listed on, or determined eligible for listing on, the National Register, or listed in the City Landmarks Registry. It also includes cultural landscapes as identified by the National Park Service. The cultural resources impact area is bounded by Biddle Street to the north, Leonor K. Sullivan Boulevard and the levee to the east, and Chouteau Avenue to the south. The western boundary includes several demarcations: I-55 south of the park, Broadway along the park edge including two blocks further west to encompass Kiener Plaza, and I-70 north of the MLK Bridge. A graphic depicting the cultural resources impact area is provided in chapter 3.

#### Impact Thresholds

For purposes of analyzing potential impacts on historic buildings, structures, sites, objects and districts, the thresholds of change for the intensity of an impact are defined as follows:

**Negligible:** Impacts would be at the lowest levels of detection – barely measurable with no perceptible consequences.

**Minor:** Impacts would affect character-defining features but would not diminish the overall integrity of the building, structure, site, object or district.

**Moderate:** Impacts would alter a character-defining feature(s), diminishing the overall integrity of the building, structure, site, object or district. A programmatic agreement is executed among the National Park Service, applicable state or tribal historic preservation officer, and the Advisory Council on Historic

Preservation in accordance with 36 CFR 800.14(b). Measures identified in the programmatic agreement to minimize or mitigate adverse impacts reduce the intensity under NEPA from major to moderate.

Major: Impacts would alter a character-defining feature(s), diminishing the overall integrity of the building, structure, site, object or district. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a programmatic agreement in accordance with 36 CFR 800.14(b).

Duration: Short-term impacts would occur during construction. Long-term impacts would continue or occur after construction is complete.

### Impacts of the Alternatives

#### Alternative 1: No-Action Alternative

Under alternative 1, the NPS would landscape the surface of the Park Over the Highway structure after MoDOT completes its construction, as discussed in Cumulative Impacts. During construction of the landscape, activities such as grading, planting, and staging would be evident in the short term and have an impact on the NHL District's character due to the disturbance of character-defining features such as vegetation and topography. This construction-period change would be reversed once the construction was completed, so would not constitute a permanent disruption or diminishment of the historic integrity of the district.

The Park Over the Highway landscaping would create continuous green space between Luther Ely Smith Square and the park grounds would provide enhanced setting and pedestrian access, both of which are in keeping with Saarinen/Kiley's unrealized design goal of better connecting these sections of the park. It could also change the NHL District due to alterations to the topography and planting, which may alter the visual relationship between the Old

#### CHARACTER-DEFINING FEATURE

— A prominent or distinctive aspect, quality, or characteristic of a historic property that contributes significantly to its physical character. Structures, objects, vegetation, spatial relationships, views, furnishings, decorative details, and materials may be such features.

Courthouse and the Arch. Measures would be taken to minimize the impact of topographic changes, which would be subject to additional design review requirements and Section 106 compliance to ensure the integrity of the NHL District.

In this alternative, few other changes to the existing condition of the historic buildings, structures, sites, objects, and districts would occur. Historic properties would retain their integrity and remain in their current conditions. The Old Courthouse would remain largely unchanged in appearance and function; however, the addition of an exterior lift for accessibility purposes would not have a substantial impact to the building's structure, but would be visible as a noticeable but small change to the building's exterior appearance. In contrast to the action alternatives, with the exception of the creation of the Park Over the Highway landscape, no other noticeable changes would occur in the park or along the levee.

Parkwide and locally, construction-related impacts under the no-action alternative would result in short-term minor adverse impacts to character-defining features of the NHL District such as vegetation and topography. The addition of the Park Over the Highway landscaping would also have long-term minor adverse impacts to these features, but would also have long-term beneficial impacts for example on the setting of the NHL District.

#### Cumulative Impacts for Alternative 1

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have

potential impacts on historic buildings, structures, sites, objects, and districts include:

- Old Courthouse renovations and repairs
- Visitor Center/Museum roof replacement
- Repair North and South Overlook stairs
- Construction of the Park Over the Highway structure
- Kiener Plaza
- Poplar Street Bridge improvements

The Old Courthouse renovations and repairs are ongoing, and are expected to improve the condition of the historic building, as well as maintain and enhance its integrity. The replacement of the roof on the underground Visitor Center/Museum is anticipated to occur whether or not the action alternatives occur. During the construction period, the roof replacement would require extensive ground surface and structural disturbance to the Visitor Center/Museum as well as the lawn within the park's primary axis and vista directly beneath the Arch. However, the long-term impacts would be beneficial due to the roof repair; the reduction in leaks would benefit the historic structure as well as the collections maintained within it. The repair of the North and South Overlook stairs would occur in the future to eliminate hazards and repair degraded materials. It is expected to result in negligible short-term disturbance within the NHL District during construction that would dismantle the stairs and limit access, but would support the historic integrity and condition of the structure and the district in the long term due to the resource being repaired and hazards eliminated. The construction of the Park Over the Highway structure over I-70 would require demolition, excavation, grading, construction and staging activities, and disruptions to pedestrian circulation in the West Gateway. This construction-period change would be finished once the construction was completed, so it would not constitute a permanent disruption or diminishment of the historic integrity of the district. The construction at Kiener Plaza

and surrounding streetscape as well as the Poplar Street Bridge improvements would involve construction and staging activities in the short-term that would be visible from adjacent historic structures and districts.

The no-action alternative, as noted above, would result in minor short- and long-term adverse impacts to historic buildings, structures, sites, objects, and districts. Combined with the other past, present, and reasonably foreseeable future actions, there would be short-term moderate adverse and long-term minor adverse as well as beneficial impacts to historic buildings, structures, sites, objects, and districts. However, this alternative would contribute minimally to those impacts.

#### Alternative 2: Moderate Change

During construction, disruption to traffic, grading, and other construction-related impacts would be evident in the short term and have an effect on the NHL District's character due to the disturbance of character-defining features such as vegetation, topography, and circulation features. This construction-period change would be reversed once the construction was completed, so it would not constitute a permanent disruption or diminishment of the historic integrity of the district. The historic buildings and structures, objects, and sites within the park would only be affected by temporary alterations of appearance (scaffolding, fencing) to protect visitors or resources during the construction period.

The most noticeable long-term adverse impacts would result from the proposed accessibility changes that would affect the Gateway Arch and the Visitor Center/Museum. The addition of both interior and exterior ramps, handrails, guardrails, and security would alter the structure and the entrance/exit experience of visitors as designed by Saarinen. The Park Over the Highway could change the NHL District due to alterations to the topography and planting, which may alter the visual relationship between the Old Courthouse and the Arch. Changes to the Old Courthouse to provide additional access to the first and second

floors would affect the Old Courthouse due to the addition of ramps on the south façade, ramps at the doors, and elevators in the interior; these changes, as well as renovation of galleries and installation of new exhibits on the first and second floors would alter the appearance of the building and may also result in modification to its historic materials (for example, to install elevator mechanisms).

Changes that would noticeably affect historic buildings, structures, sites, objects, and districts in minor ways include topographic alterations, such as grading around the North and South Ponds and along the East Slopes for accessible paths and to control stormwater runoff. The alteration to adjacent topography would change the landform within the grounds adjacent to character-defining features of the NHL district such as the overlooks, Grand Staircase, and railroad tunnels. The addition of two to four accessible paths on the East Slopes would require extensive grading, similarly changing the surrounding topography and therefore the visitor's experience as intended by Kiley-Saarinen. The proposed changes at the Reflecting Ponds have the potential to affect character-defining features of the NHL District, and as a result, the historic setting of the Gateway Arch. They also have the potential to affect the setting of adjacent historic properties such as the Old Cathedral.

The establishment of a continuous security perimeter would affect the Grand Staircase and overlooks as bollards are proposed to be placed at the foot of each of these, creating a visual barrier that alters the structure's character. Alterations to Luther Ely Smith Square, which is part of the setting of the Old Courthouse and adjacent historic buildings such as the International Fur Exchange, would result in increased traffic and idling vehicles along some of the streets around the square as visitors are dropped off. The increased traffic and idling could affect the historic buildings due to increased air pollution from particles from exhaust that are known to cause soiling and damage on historic façade materials such as stonework.

Also, the proposed changes to the Central Riverfront would noticeably affect character-defining features of the NHL District including the North and South Overlooks and the Grand Staircase due to the raising of Leonor K. Sullivan Boulevard's elevation, which would change the relationship of these features to the street, possibly impacting the structure of the staircase and the overlook walls' distinct curved form which is character-defining. The Central Riverfront project would not physically alter the historic fabric of the Eads Bridge, but the addition of fill adjacent to the footings of the bridge would have the potential to alter the visual setting of the bridge, and could obscure portions of the historic structure from view. These changes would also alter the historic levee along the Mississippi River by changing the relationship of the road and the levee, possibly resulting in the removal or alteration of some of the levee's historic cobblestone materials.

The proposed planting plan and mowing regime in this alternative would not noticeably affect historic buildings, structures, sites, objects, and districts due to the minimal changes proposed, compared to the vegetation's existing appearance. The identified historic buildings, structures, sites, objects, and districts outside the park boundary and within the Cultural Resources Impact Area would in general not be affected by the proposed alternative as it is not visible from the vast majority of them and the physical changes are small and localized. The Central Riverfront project would not have a noticeable impact on the historic buildings that compose the Laclede's Landing historic district, although the grade change at Leonor K. Sullivan Boulevard along the riverfront would potentially change the relationship of the street grades to the levee where they meet.

Some beneficial impacts are expected to arise from this alternative. Proposed changes to the Processional Walks would enhance character-defining features of the NHL District as well as the setting of the Gateway Arch. The repair of drainage and surfacing, potential addition of cobbles per the Kiley-Saarinen design, as well as replacement of the declining ash

planting with a tree species in a form closer to the design intent, would have an overall beneficial impact. Likewise, between Luther Ely Smith Square and the park grounds the addition of continuous green space would provide an enhanced setting and pedestrian access, both of which are in keeping with Saarinen/Kiley's unrealized design goal of better connecting these sections of the park; this would benefit historic resources. Proposed changes at the East Slopes would include denser woodland plantings that would enhance the intended appearance of this area, in keeping with how it was designed by Kiley-Saarinen. In the Central Riverfront, there would be improved protection from the river flooding that currently causes risks to the concrete structure of the overlooks and the Grand Staircase.

Mitigation measures would be undertaken to minimize the impact of alterations, such as topographic and visual changes, which would be subject to additional design review requirements and Section 106 compliance to ensure the integrity of the NHL District and the historic resources in the Area of Potential Effects identified in the programmatic agreement developed during the Section 106 process. The programmatic agreement includes the establishment of a Collaborative Design Review Team to review draft schematic and design documents, evaluate how projects may affect resources within the Section 106 Area of Potential Effects, and make recommendations to avoid any adverse effects.

Parkwide and locally, construction-related impacts under alternative 2 would result in short-term moderate adverse impacts to character-defining features of the NHL district such as vegetation and topography, as well as temporary alterations of appearance. The addition of interior and exterior ramps into the Visitor Center/Museum, accessibility modifications at the Old Courthouse, paths around the North and South ponds and along the East Slopes, noticeable changes to character-defining features of the park along the Central Riverfront, and the addition of the Park Over the Highway landscaping

would also have parkwide and local long-term moderate adverse impacts to character-defining features of the NHL district, such as vegetation and topography. Negligible to minor short-term and long-term impacts on resources outside the park boundary within the cultural resources impact area would occur due to changes to the relationship between Leonor K. Sullivan Boulevard and the historic levee and the addition of fill adjacent to the Eads Bridge footings. The Park Over the Highway landscaped connection, replacement of ash trees and repair of the Processional Walks, and additional plantings on the East Slopes would also have long-term beneficial impacts to other character-defining features such as circulation features and the setting of the NHL District.

#### Cumulative Impacts for Alternative 2

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on historic buildings, structures, sites, objects, and districts include the same projects discussed under alternative 1, the no-action alternative, earlier in this chapter. Cumulative projects described in alternative 1 that are expected to be incorporated into the design and construction process under alternative 2 include the Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs.

Alternative 2, as noted above, would involve some alteration of historic buildings, structures, sites, objects, and districts, in particular through changes to their settings and addition of accessibility and security measures that alter the visual character of the resources or their settings. Combined with the other past, present, and reasonably foreseeable future actions, there would be short-term moderate adverse and long-term moderate adverse as well as beneficial impacts to historic buildings, structures, sites, objects, and districts. The coordination of these projects with the implementation of alternative 2 would serve to lessen the short-term impacts of each project occurring on its own.

### Alternative 3: Maximum Change

During construction, disruption to traffic, grading, and other related impacts would be evident in the short term and would have an effect on the NHL District's character due to the disturbance of character-defining features such as vegetation, topography, and circulation features. This construction-period change would be finished once the construction was completed, so it would not constitute a permanent diminishment of the historic integrity of the district. The historic buildings and structures, objects, and sites within the park would only be affected by temporary alterations of appearance (scaffolding, fencing) to protect visitors or resources during the construction period.

The greatest impacts would result from the addition and alterations to the Visitor Center/Museum and the West Gateway area. In alternative 3, changes at the West Gateway have the potential to affect the NHL District, the Gateway Arch, the Visitor Center/Museum, and the Old Courthouse; and adjacent historic buildings such as the International Fur Exchange on the south side of Luther Ely Smith Square. The addition of grade changes and new structures to add a new West Entrance to the Visitor Center/Museum would reshape this section of the park landscape, resulting in some changes to the settings of the adjacent historic properties, as well as altering the physical fabric of the Visitor Center/Museum and the NHL District along its primary view axis between the Old Courthouse and the river. The new glass façade would have a direct visual connection to the Old Courthouse and the existing berm height would be modified, altering the visual relationship between the Old Courthouse and the Arch. The use of this area as the park's main entryway would result in increased bus and car traffic at the proposed drop-off area at Luther Ely Smith Square, which could affect historic buildings and structures surrounding the square due to increased air pollution from particles from exhaust that are known to cause soiling and damage on historic façade materials such as stonework. Proposed accessibility changes would affect the Gateway Arch and the Visitor Center/

Museum through the addition of interior and exterior ramps, handrails, guardrails, and security features that would alter the structure and the entrance/exit experience of visitors as designed by Saarinen.

Changes that would noticeably affect historic buildings, structures, sites, objects, and districts in minor ways include topographic alterations, such as grading around the North and South Ponds and along the East Slopes for accessible paths and to control stormwater runoff. The alteration to adjacent topography would change the landform surrounding the overlooks, Grand Staircase, and railroad tunnels within the NHL district. The addition of two to four accessible paths on the East Slopes would require extensive grading, similarly changing the surrounding topography and therefore the visitor's experience as intended by Kiley-Saarinen. The proposed changes at the Reflecting Ponds have the potential to affect character-defining features of the NHL District, which comprises the historic setting of the Gateway Arch. They also have the potential to affect the setting of adjacent historic resources such as the Old Cathedral.

In this action alternative, similar to the impacts discussed in alternative 2, the proposed changes to the Old Courthouse would affect this historic building due to addition of ramps to the building exterior and elevators in the interior, as well as renovation of galleries and installation of new exhibits on the first and second floors. In addition, the proposed changes to the Central Riverfront, as described in alternative 2, would affect character-defining features of the NHL District including the North and South Overlooks and the Grand Staircase due to the raising of Leonor K. Sullivan Boulevard's elevation. These changes would also affect the Eads Bridge and the historic levee along the Mississippi River, also as noted above in alternative 2. Some actions, such as the proposed planting and mowing regime (similar to the one discussed in alternative 2), would not have a detectable impact upon historic buildings, structures, sites, objects, and districts.

Some beneficial impacts would occur under alternative 3. The proposed addition of planted park connection across I-70 would have a beneficial impact on historic buildings, structures, sites, objects, and districts, as described under alternative 2 above. In alternative 3, changes proposed at the North Gateway would be beneficial, as removal of the non-historic parking garage would enhance the setting of character-defining features of the NHL District as well as adjacent resources such as Eads Bridge, the Laclede's Landing Historic District, and the North Overlook. Another beneficial result of eliminating the Arch Parking Garage would be the opening up of views between the park and the Eads Bridge, as well as a visual connection between Laclede's Landing and the park through the four portals underneath the Eads Bridge. In this action alternative, proposed changes at the East Slopes could have beneficial impacts on character-defining features of the NHL District including the railroad tunnel cuts and Grand Staircase due to the addition of denser woodland plantings that would enhance the intended appearance of this area, in keeping with how it was designed by Kiley-Saarinen. Proposed changes to the Processional Walks would have beneficial impacts on character-defining features of the NHL District as well as the setting of the Gateway Arch, as the repair of drainage and surfacing, the potential addition of cobbles per Kiley-Saarinen design, as well as replacement of the declining ash planting with a tree species closer to the design intent would have an overall beneficial impact. There would also be beneficial impacts due to improved protection from flooding that currently causes risks to the concrete structure of the overlooks and the Grand Staircase.

Mitigation measures and additional design review requirements and Section 106 compliance would occur as described under alternative 2.

Parkwide and locally, construction-related impacts under alternative 3 would result in short-term moderate adverse impacts to character-defining features of the NHL district such as vegetation and topography, as well as temporary alterations of appearance.

The addition of the new West Entrance façade and its associated vegetation, circulation, and topographic changes, the installation of interior and exterior ramps into the Visitor Center/Museum, accessibility modifications at the Old Courthouse, paths around the North and South ponds and along the East Slopes, and noticeable changes to the park landscape along the Central Riverfront would have parkwide and local long-term moderate adverse impacts to character-defining features of the NHL District, such as vegetation and topography. Negligible to minor short-term and long-term impacts on resources outside the park boundary within the cultural resources impact area would occur due to changes to relationship between Leonor K. Sullivan Boulevard and the historic levee and the addition of fill adjacent to the Eads Bridge footings. The Park Over the Highway landscaped connection, the removal of the non-historic Arch Parking Garage, replacement of ash trees and repair of the Processional Walks, and additional plantings on the East Slopes would have long-term beneficial impacts to other character-defining features such as circulation features and the setting of the NHL District.

#### Cumulative Impacts for Alternative 3

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on historic buildings, structures, sites, objects, and districts include the same projects discussed under alternative 1, the no-action alternative. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 3, such as the Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs. This coordination would serve to lessen the short-term impacts of each project occurring on its own.

Alternative 3, as noted above, would involve some alteration of historic buildings, structures, sites, objects, and districts, in particular through changes to their settings and addition of accessibility and security measures that alter the visual character of the resources or their settings. Combined

with the other past, present, and reasonably foreseeable future actions, there would be short-term moderate adverse and long-term moderate adverse as well as beneficial impacts to historic buildings, structures, sites, objects, and districts.

## CULTURAL LANDSCAPES

### Study Area/Impact Area

The cultural landscape impact area encompasses the park boundaries, the Central Riverfront, and cultural landscapes identified by the NPS in the immediate vicinity of the project area. The cultural landscape impact area is bounded by Biddle Street to the north, Leonor K. Sullivan Boulevard and the levee to the east, and Chouteau Avenue to the south. The western boundary includes several demarcations: I-55 south of the park, Broadway along the park edge including two blocks further west to encompass Kiener Plaza, and I-70 north of the MLK Bridge. A graphic depicting the cultural landscape impact area is provided on page 64 of chapter 3.

### Impact Thresholds

For purposes of analyzing potential impacts on cultural landscapes, the thresholds of change for the intensity of an impact are defined as follows:

**Negligible:** Impacts would be at the lowest levels of detection-barely measurable with no perceptible impacts.

**Minor:** Impacts to a pattern(s) or feature(s) of the landscape would not diminish the overall integrity of the landscape.

**Moderate:** Impacts to a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the landscape. A programmatic agreement is executed among the National Park Service, applicable state or tribal historic preservation officer, and the Advisory Council on Historic Preservation in accordance with 36 CFR 800.14(b). Measures identified in the programmatic agreement to minimize or mitigate adverse impacts reduce the intensity under NEPA from major to moderate.

**Major:** Impacts to a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the landscape. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a programmatic agreement in accordance with 36 CFR 800.14(b).

**Duration:** Short-term impacts would occur during construction. Long-term impacts would continue or occur after construction is complete.

## IMPACTS OF THE ALTERNATIVES

### Alternative 1: No-Action Alternative

NPS would landscape the surface of the Park Over the Highway structure under alternative 1 after MoDOT completes its construction, as discussed in Cumulative Impacts. During construction of the landscape, activities such as grading, planting, and staging would be evident and would have an impact on the cultural landscape's character in the short term due to temporary alteration of appearance such as excavation, loss of vegetation, or fencing.

The landscaping of the Park Over the Highway would change the cultural landscape by altering the topography, planting, and visual relationship along the primary axis between the Old Courthouse and the Arch. The Park Over the Highway landscape would also enhance the primary axial connection between the Old Courthouse, Arch, and river, and would be in keeping with Saarinen/Kiley's unrealized design goal of better connecting these sections of the park.

The Processional Walks, an important cultural landscape feature together with its adjacent allées of trees, would be maintained. Please see the approved EAB EA for detailed assessment of the plans to address the possible threat of the emerald ash borer on the Rosehill ash trees in the park, including the allées (NPS 201b).

The Central Riverfront would remain largely unchanged; the features of the cultural landscape including the North and South Overlooks and Grand Staircase would continue to risk periodic damage by river flooding that could result in the loss of the resource over time.

The East Slopes and Reflecting Ponds would remain unchanged, with plantings and lawn retaining their current non-historic appearance, as rehabilitation of its historic, denser planted appearance would not be undertaken.

The Park Over the Highway landscape could result in perceptible changes to the cultural landscape of the West Gateway. Mitigation measures would be undertaken to minimize the impact of alterations, such as topographic and visual changes, which would be subject to additional design review requirements and Section 106 compliance to ensure the integrity of the cultural landscape. This alternative would not result in perceptible changes to cultural landscape features elsewhere in the park, including the Gateway Arch; the overall designed landform and spatial organization; the designed views; the system of Processional Walks; the single-species allées; the two ponds; the overlooks, including the stairs; the railroad open cuts and tunnels; the Grand Staircase; the baldcypress circles; the screen plantings and depressed service areas; the entrance ramps into the Gateway Arch; and the concrete benches.

Parkwide, the no-action alternative would have short-term minor adverse impacts due to construction activities that would disrupt cultural landscape features such as vegetation and views. The Park Over the Highway landscape alterations to the visual relationship between the Old Courthouse and the Arch and retention of portions of the park landscape with non-historic appearances would have long-term minor adverse impacts to the Jefferson National Expansion Memorial cultural landscape. However, the Park Over the Highway would also have long-term beneficial impacts by enhancing the primary axial connection between the Old Courthouse, the park, and the river.

#### Cumulative Impacts for Alternative 1

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on cultural landscapes include:

- Construction of the Park Over the Highway structure
- Visitor Center/Museum roof replacement
- Repair North and South Overlook stairs

The construction of the Park Over the Highway structure over I-70 would require demolition, excavation, grading, and other construction and staging activities in the West Gateway. It would connect Luther Ely Smith Square to the western portion of the park over the I-70 depressed highway and change some associated traffic patterns. It is expected to have a beneficial impact on the cultural landscape as it would implement an unrealized connection that is part of the Saarinen/Kiley conceptual design for the park; and it would reduce the noise and views of the highway below, reinforcing and strengthening the main axis of the park design, without appreciably altering character-defining features of the cultural landscape.

The replacement of the roof on the underground Visitor Center/Museum would require extensive temporary ground surface disturbance to the lawn within the park's primary axis and vista directly beneath the Arch. The repair of the North and South Overlook stairs would also require temporary ground disturbance and during construction.

The no-action alternative, as noted above, would involve short- and long-term minor adverse impacts to the cultural landscape, as well as beneficial impacts. Combined with the other past, present, and reasonably foreseeable future actions, there would be short- and long-term minor adverse and long-term beneficial impacts to the cultural landscape. However, this alternative would contribute minimally to those impacts.

## Alternative 2: Moderate Change

During construction, disruption to traffic, grading and excavation, and other construction-related impacts would be evident and would have an impact on the cultural landscape's character. The cultural landscape parkwide and locally would be affected by limiting of access to different areas as construction is phased, and temporary alteration of appearance (excavation, loss of vegetation, fencing) to protect visitors or resources during the construction period.

Under this alternative, the proposed changes that would most affect the character-defining features of the cultural landscape in the long-term include those planned for accessibility and involving topographic change. The landscaping of the Park Over the Highway would change the cultural landscape due to alterations to the topography and planting that may alter the visual relationship along the primary axis between the Old Courthouse and the Arch. The alterations to Luther Ely Smith Square would also enhance the primary axial connection between the Old Courthouse, Arch, and river, resulting in a beneficial impact from the landscaping of the Park Over the Highway structure over I-70, in keeping with Saarinen/Kiley's unrealized design goal of better connecting these sections of the park.

Grading around the North and South Ponds for accessible paths would affect the ponds and views in these areas as well as the sculpted topography of the pond areas. The addition of accessible paths on the East Slopes connecting the park to the riverfront would affect the sculpted topography and processional routes, and thus alter the visitor's experience as intended by Kiley-Saarinen. New accessibility ramps at the Arch legs; and park perimeter walls and bollards would noticeably alter the cultural landscape. Slight regrading in the northwest corner of the park and the addition of accessible paths on the East Slopes and pond areas would result in minor, but noticeable, impacts to the overall landform and spatial organization. The proposed changes to the Central Riverfront could noticeably alter character-defining features of the cultural landscape including

the North and South Overlooks and the Grand Staircase due to the raising of Leonor K. Sullivan Boulevard's elevation.

Some beneficial impacts are expected to arise from this alternative. For example, / proposed changes to the Processional Walks including repair of drainage and surfacing, the potential addition of cobbles per Kiley-Saarinen design, and replacement of the declining ash planting with a tree species in a form closer to the design intent would have a beneficial impact on the cultural landscape. Proposed new planting on the East Slopes with a denser woodland character would enhance the intended appearance of this area, in keeping with how it was designed and originally planted. In the Central Riverfront area, improved protection from river flooding by raising Leonor K. Sullivan Boulevard would be beneficial, protecting the park landscape more effectively from damage and erosion by river flooding. Mitigation measures would be undertaken to minimize the impact of alterations to the landscape, such as topographic and spatial organization changes, which would be subject to additional design review requirements and Section 106 compliance to ensure the integrity of the cultural landscape. The programmatic agreement includes the establishment of a Collaborative Design Review Team to review draft schematic and design documents, evaluate how projects may affect resources within the Section 106 Area of Potential Effects, and make recommendations to avoid any adverse effects.

Parkwide, alternative 2 would have short-term moderate adverse impacts due to construction activities that would disrupt the cultural landscape, including vegetation, topography, and views. Long-term minor adverse parkwide and local impacts to the Jefferson National Expansion Memorial cultural landscape would occur due to the Park Over the Highway landscape alterations to the visual relationship between the Old Courthouse and the Arch, changes to the sculpted topography due to the addition of paths around the ponds and at the East Slopes, as well as the addition of interior and exterior ramps at the Visitor Center/Museum, and the changes to character-defining features

of the landscape such as changes to the North and South Overlooks and the Grand Staircase. Long-term beneficial impacts on the cultural landscape would occur under alternative 2 due to the addition of the landscaped Park Over the Highway that would reinforce the Saarinen/Kiley design intent for a connection. In addition, the replacement of the ash trees and repair of the Processional Walks, as well as the replanting of the East Slopes would be in keeping with the Saarinen/Kiley design intent and would enhance the cultural landscape.

#### Cumulative Impacts for Alternative 2

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on cultural landscapes include the same projects discussed under alternative 1, the no-action alternative, earlier in this section. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 2, such as the Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs.

Alternative 2, as noted above, would involve some alteration of cultural landscapes. Combined with the other past, present, and reasonably foreseeable future projects, there would be short-term moderate and long-term minor adverse impacts to the cultural landscape. There would also be beneficial impacts. The coordination of these projects with the implementation of alternative 2 would serve to lessen the short-term impacts of each project occurring on its own.

#### Alternative 3: Maximum Change

During construction, disruption to traffic, grading and excavation, and other related impacts would have an impact on the cultural landscape. The cultural landscape parkwide and locally would be affected by limiting of access to different areas as construction is phased, and temporary alteration of appearance (excavation, loss of vegetation, fencing) to protect visitors or resources during the construction period.

The greatest impacts to the cultural landscape would result from the addition and alterations to the Visitor Center/Museum and especially in the West Gateway area. In alternative 3, changes at the West Gateway have the potential to affect the overall landform and spatial organization of the park, altering the cultural landscape's appearance, such as the current visual axis between the Old Courthouse and the Arch. The landscaping of the Park Over the Highway structure over I-70 and a new West Entrance to the Visitor Center/Museum would alter the route of pedestrians approaching the Gateway Arch, the existing berm height would be modified, and the new glass façade would have a direct visual connection to the Old Courthouse, altering the current views along this primary axis. Proposed accessibility changes could affect the cultural landscape. The addition of ramps, handrails, guardrails, and security features would physically and visually alter the entrances at the Arch legs and Visitor Center/Museum as well as changing the overall entrance/exit experience of visitors as intended by Saarinen.

Changes that would also noticeably affect cultural landscapes include topographic alterations, such as grading around the North and South Ponds and along the East Slopes for accessible paths and to control stormwater runoff. This would result in minor alterations of character-defining features of the cultural landscape including the landform and spatial organization, the designed views, and the system of Processional Walks. The proposed changes to the Central Riverfront could noticeably alter character-defining features of the cultural landscape including the North and South Overlooks and the Grand Staircase due to the raising of Leonor K. Sullivan Boulevard's elevation. Existing roads, which form the boundaries of the park, would include altered traffic patterns and types of traffic. With the exception of the removal of the through traffic portions of Washington Avenue and portions of Memorial Drive near the North Gateway, the existing roads would continue to define the boundaries of the park, retaining their spatial role in the cultural landscape. The park's pedestrian circulation, the primary circulation feature of the cultural landscape, would be maintained and vehicular circulation would continue to be restricted to the perimeter of the park.

Some impacts would not have a detectable effect upon cultural landscapes. For example, the accessibility changes proposed for the Old Courthouse and elimination of the Arch Parking Garage would not have a substantial impact on the cultural landscape. The Old Courthouse ramps would be a noticeable addition to the exterior of the building, which is part of the larger landscape. The parking garage area was initially designated by Saarinen/Kiley for parking, but was not refined any further in initial designs; the current garage is relatively low in profile and unobtrusive within the park, so its removal would neither alter the historic nor the existing appearance of the overall landscape substantially. Plantings would be selected to be compatible with the historic landscape.

Some beneficial impacts are expected to arise from alternative 3, similar to those described in alternative 2 above. The landscaping of the Park Over the Highway and related alterations to Luther Ely Smith Square would strengthen the primary axial connection between the Old Courthouse, Arch, and river, in keeping with Saarinen/Kiley's unrealized design goal of better connecting these sections of the park. In alternative 3, changes proposed at the North Gateway, such as removal of the non-historic parking garage, would enhance the cultural landscape. Proposed changes to the Processional Walks, including repair of drainage and surfacing, the potential addition of cobbles per Kiley-Saarinen design, and replacement of the declining ash planting with a tree species in a form closer to the design intent would enhance these character-defining features of the cultural landscape. Proposed new planting on the East Slopes with a denser woodland character would enhance the intended appearance of this area, in keeping with how it was designed and originally planted although changing its current appearance. There would also be beneficial impacts from raising Leonor K. Sullivan Boulevard that would improve protection from flooding and minimize the potential for loss or damage to the East Slopes, overlooks, and Grand Staircase. A programmatic agreement was executed to identify measures to minimize or mitigate adverse impacts. Mitigation measures and additional design review requirements and

Section 106 compliance would occur, as described under alternative 2.

Parkwide, alternative 3 would have short-term moderate impacts due to construction activities that would disrupt the cultural landscape, including vegetation, topography, and views. Long-term moderate adverse parkwide and local impacts to the Jefferson National Expansion Memorial cultural landscape would occur due to the addition of the new West Entrance and its associated paving, planting, and topographic changes; it would also alter the views along the primary axis between the Old Courthouse and the Arch. Changes to the sculpted topography due to the addition of paths around the ponds and at the East Slopes, as well as the addition of interior and exterior ramps at the Visitor Center/Museum, grading around the ponds, and changes to the North and South Overlooks and the Grand Staircase along the Central Riverfront would also contribute to these adverse impacts. Long-term beneficial impacts to the cultural landscape would occur under alternative 3 due to the addition of the Park Over the Highway in keeping with the Saarinen/Kiley design intent for a pedestrian connection. In addition, beneficial impacts would arise from the replacement of the ash trees and repair of the Processional Walks as well as the replanting of the East Slopes, as these changes would be in keeping with the Saarinen/Kiley design intent and would enhance the cultural landscape. Removal of the non-historic parking garage would enhance the cultural landscape and the reduction of flooding along the Central Riverfront would improve protection of the landscape from flooding, contributing to the beneficial impacts.

#### Cumulative Impacts for Alternative 3

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on cultural landscapes include the same projects discussed under alternative 1, the no-action alternative, earlier in this section. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 3, such as the Visitor Center/Museum roof

replacement and repair of the North and South Overlook stairs. This coordination would serve to lessen the short-term impacts of each project occurring on its own.

Alternative 3, as noted above, would result in moderate short-term and long-term adverse impacts to cultural landscapes. There would also be beneficial impacts. Combined with other past, present, and reasonably foreseeable future projects, there would also be short- and long-term moderate adverse impacts and some beneficial impacts.

### **ARCHEOLOGICAL RESOURCES**

As archeological resources exist essentially in subsurface contexts, potential impacts to archeological resources are assessed according to the extent to which the proposed alternatives would involve ground disturbing activities such as excavation or grading. Analysis of possible impacts to archeological resources was based on a review of previous archeological studies, consideration of the proposed design concepts, and other information available on the archeological context of the area.

#### **Study Area/ Area of Potential Effect**

The impact area for archeological resources is broadly defined to extend between Biddle Street and Chouteau Avenue along the riverfront and bounded on the east by the Mississippi River and west by Broadway. While much of the proposed work would focus on the park grounds and Central Riverfront, some elements of the project – particularly elements of the utility systems such as water lines, electrical lines, and stormwater management features – may involve ground-disturbing activities beyond the park boundary and the Central Riverfront.

#### **Impact Thresholds**

For purposes of analyzing potential impacts on archeological resources, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impact is at the lowest level of detection. Impacts would be measurable but

with no perceptible adverse or beneficial consequences.

Minor: Disturbance of a site(s) results in little, if any, loss of integrity.

Moderate: Disturbance of a site(s) results in loss of integrity. A programmatic agreement is executed among the National Park Service, applicable state or tribal historic preservation officer, and the Advisory Council on Historic Preservation in accordance with 36 CFR 800.14(b). Measures identified in the programmatic agreement to minimize or mitigate adverse impacts reduce the intensity under NEPA from major to moderate.

Major: Disturbance of a site(s) results in loss of integrity. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/ or Advisory Council are unable to negotiate and execute a programmatic agreement in accordance with 36 CFR 800.14(b).

Duration: Archeological resources are non-renewable. Once an impact occurs, the effect is irreversible and permanent; therefore duration is not identified within this analysis.

### **IMPACTS OF THE ALTERNATIVES**

#### **Alternative 1: No-Action Alternative**

In the cultural resources impact area, archeological resources are located in subsurface contexts, and are primarily anticipated to be affected by ground-disturbing activities such as excavation or grading. Under alternative 1, the NPS would landscape the surface of the Park Over the Highway structure after MoDOT completes its construction, as discussed in Cumulative Impacts. During construction, activities such as grading the berm at Memorial Drive and planting would occur and could disturb archeological resources if unanticipated resources are located in the vicinity of these activities. Prior to initiating any ground-disturbing activities, the area would be evaluated for its potential to contribute archeological information. The guidance and mitigation measures regarding the treatment

of archeological resources developed through the Section 106 process would be followed if previously unreported and unanticipated resources were to be found during construction of the Park Over the Highway to ensure the resources would be properly handled.

Various maintenance activities such as tree and shrub removal and replacement, turf replacement, irrigation and pavement repair or replacement, and utility work could result in excavation and grading within the park and may have an impact on archeological resources if they exist below ground in those locations. If archeological resources were encountered during ground disturbances proposed under the no-action alternative related to ongoing and planned maintenance at the park, they would be addressed by the NPS standard operating procedures which encourage monitoring of excavation activities in high-potential areas as well as resource preservation through avoidance.

Any ground disturbance related to maintenance activities would be limited in size and depth and would occur primarily in previously disturbed areas. The Park Over the Highway landscape would constitute a larger disruption at Luther Ely Smith Square and the western edge of the park along Memorial Drive and could disturb as-yet unidentified archeological resources, which could result in a loss of integrity; however, the mitigation measures described above would be implemented to minimize impacts. Overall, alternative 1 would cause minor adverse impacts to archeological resources.

#### Cumulative Impacts for Alternative 1

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on archeological resources include:

- Citygarden
- Old Post Office Plaza
- Federal Reserve Bank of St. Louis

- The Mercantile Exchange (MX)
- The Mississippi River Bridge
- Kiener Plaza and streetscape improvements
- Construction of the Park Over the Highway structure
- Visitor Center/Museum roof replacement
- Ballpark Village
- Bottle District
- Poplar Street Bridge improvements

These cumulative projects involve some amount of excavation and/or grading. As described in the GMP (on pages 3-24 to 3-27), archeological sites recorded within St. Louis such as Cochran Gardens, Walsh's Row, and Lafayette Avenue illustrate that even under significant amounts of building rubble, intact material remains below the surface of St. Louis. The projects at Old Post Office Plaza, Federal Reserve Bank of St. Louis, Mercantile Exchange (MX), the Mississippi River Bridge, the Poplar Street Bridge improvements, and the Park Over the Highway structure all involve new construction requiring excavation and ground disturbance, increasing the likelihood that as-yet unidentified archeological resources could be affected by being uncovered from their subsurface context and/or damaged by construction equipment before they can be properly evaluated. The Kiener Plaza and streetscape improvements also have the potential for ground disturbance to uncover or affect archeological resources.

The Visitor Center/Museum Roof Replacement would require excavation in areas that were disturbed when the Visitor Center/Museum was originally constructed, but could affect as-yet unrecorded adjacent archeological resources.

The no-action alternative, as noted above, would result in minor adverse impacts to archeological resources. Combined with other past, present, and reasonably

foreseeable future actions, there could be moderate adverse cumulative impacts to archeological resources in historic downtown St. Louis from ground-disturbing activities associated with the combined projects. This alternative would contribute minimally to these impacts.

#### Alternative 2: Moderate Change

As archeological resources are located in subsurface contexts, they are primarily anticipated to be affected by ground-disturbing activities such as excavation or grading. In this alternative, several project elements would require ground disturbance activities that would be somewhat limited in size and depth and would occur primarily in previously disturbed areas of the park. Excavation for implementation of perimeter security measures such as bollards would occur in limited areas. Some grading would occur to create new accessible paths at the ponds and the East Slopes. The removal and replacement of the Rosehill ash trees would include excavation and ground disturbance along the Processional Walks to remove and replant the trees, as well as to provide improved drainage. The addition of new exterior ramps to access the Visitor Center/Museum would require some ground disturbance as would the planting of new trees and other vegetation along the East Slopes, ponds, and other areas within the park. Ground-disturbing activities would occur along the Central Riverfront in order to construct the multi-modal roadway.

The regrading of the berm at Memorial Drive and grading at Luther Ely Smith Square would be required to facilitate the Park Over the Highway landscape connection across I-70 between Luther Ely Smith Square and the park. These activities would create a larger area of disruption and could disturb as-yet unidentified archeological resources.

As the precise locations of archeological resources are not known throughout the entire project area, it is possible that many project elements could disturb previously unknown archeological resources. The programmatic agreement developed during the Section 106 process provides mitigation

measures and guidance on archeological resources identification prior to any ground disturbance, as well as treatment measures if resources are identified. The parameters of the programmatic agreement would be used to determine procedures to be followed in the event that previously unreported and unanticipated resources were to be found during construction, and would provide guidance to ensure the resources are properly handled.

Parkwide and along the Central Riverfront, ground disturbances related to the project elements could disrupt or displace unknown archeological resources and result in a loss of integrity of the archeological resource. However, the mitigation measures established in the programmatic agreement would be implemented to minimize or mitigate adverse impacts. As a result, alternative 2 would have moderate adverse impacts to archeological resources in the cultural resources impact area.

#### Cumulative Impacts for Alternative 2

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on archeological sites include the same projects discussed under alternative 1, the no-action alternative, earlier in this section. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 2, such as the Visitor Center/Museum roof replacement.

Alternative 2, as noted above, would result in moderate adverse impacts to archeological sites. Combined with other past, present, and reasonably foreseeable future actions, there could be moderate adverse cumulative impacts to archeological resources in historic downtown St. Louis from ground-disturbing activities associated with the combined projects. These cumulative projects, mostly within the vicinity but not inside the areas of the park affected by alternative 2, are identical to the impacts noted under cumulative impacts in alternative 1 above. This alternative would contribute somewhat to impacts on archeological resources.

### Alternative 3: Maximum Change

As noted earlier, archeological resources are located in subsurface contexts. Alternative 3 would include the ground-disturbing activities described in alternative 2 and would have similar impacts on archeological resources. In addition, the expansion of the Visitor Center/Museum underground to the west of the existing Visitor Center/Museum and the addition of the new West Entrance would have an impact on any as-yet unidentified archeological resources in that area due to extensive subsurface excavation. The removal of the parking garage would require extensive excavation and could disturb as-yet intact subsurface archeological resources in the vicinity of the existing garage, although this area has been previously disturbed due to the garage's construction.

As noted in alternative 2, the precise locations of all archeological resources in the project area are not known and therefore the project elements have the potential to disturb previously unknown archeological sites. Therefore, as part of the programmatic agreement developed during the Section 106 process, mitigation measures and guidance on archeological resources identification prior to any ground disturbances were developed, as well as treatment measures if resources are identified. The parameters of the programmatic agreement would be used to determine procedures to be followed in the event that previously unreported and unanticipated resources were to be found during construction and would provide guidance to ensure the resources are properly handled.

Parkwide and along the Central Riverfront, ground disturbances related to the project elements could disrupt or displace unknown archeological resources and therefore have the potential to result in a loss of integrity of archeological resources. However, the mitigation measures established in the programmatic agreement would be implemented to minimize or mitigate adverse impacts. As a result, alternative 3 would have moderate adverse impacts to archeological resources in the cultural resources impact area.

### Cumulative Impacts for Alternative 3

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on archeological sites include the same projects discussed under alternative 1, the no-action alternative, earlier in this section. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 3, such as the Visitor Center/Museum roof replacement.

Alternative 3, as noted above, would result in moderate adverse impacts to archeological sites. Combined with other past, present, and reasonably foreseeable future actions, there could be moderate adverse cumulative impacts to archeological resources in historic downtown St. Louis from ground-disturbing activities associated with the combined projects. These cumulative projects, mostly within the vicinity but not inside the areas of the park affected by alternative 3, are identical to the impacts noted under cumulative impacts in alternatives 1 and 2 above. This alternative has the potential to contribute substantially to adverse impacts on archeological resources.

## MUSEUM COLLECTIONS

### Study Area

The study area for museum collections is defined by the park's boundary.

### Impact Thresholds

The following thresholds were used to determine the magnitude of impacts on museum collections.

**Negligible:** Impact is at the lowest levels of detection — barely measurable with no perceptible consequences.

**Minor:** Impact(s) would affect the integrity of few items in the museum collection but would not degrade the usefulness of the collection for future research and interpretation.

Moderate: Impact(s) would affect the integrity of many items in the museum collection and diminish the usefulness of the collection for future research and interpretation.

Major: Impact(s) would affect the integrity of most items in the museum collection and destroy the usefulness of the collection for future research and interpretation.

Duration: Short-term impacts would occur during construction. Long-term impacts would occur during operations after construction is complete.

### Impacts of the Alternatives

#### Alternative 1: No-Action Alternative

Under the no-action alternative, there would be no changes to museum collections. At the Visitor Center/Museum, existing space, access, electrical and HVAC, and pest control issues that currently exist would continue and collections could be damaged by poor storage conditions, lack of access for curatorial care, temperature and humidity-related conditions outside of acceptable range, and damage from pests that may infest delicate materials such as historic paper or fabric items. At the Old Courthouse, access, poor storage conditions and other issues such as insufficient building climate control systems, would remain as well.

While these conditions could cause damage to or affect the integrity of a limited number of items in the museum collection, they would not cause the overall degradation of the collection or its usefulness for future research and interpretation. Visitors and researchers would continue to have access to the collections and they would be maintained using existing practices and protocols. Therefore, alternative 1 would have minor short-term adverse impacts and long-term negligible to minor adverse impacts to museum collections.

#### Cumulative Impacts for Alternative 1

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have

potential impacts on museum collections include:

- Old Courthouse renovations and repairs
- Visitor Center/Museum roof replacement

In the short term, access to exhibits and collections could be interrupted during construction related to the Old Courthouse renovations and the Visitor Center/Museum roof replacement and resources may be temporarily removed to protect them. The renovations and repairs on the Old Courthouse would help to protect the collections with updated systems such as improved temperature and humidity control. The repair or replacement of the roof on the existing Visitor Center/Museum, a previously planned project, would result in long-term beneficial impacts as it would diminish the possibility of damage to collections as a result of the roof leaking.

Alternative 1 would result in minor short-term adverse and long-term negligible to minor adverse impacts to museum collections. Combined with other past, present, and reasonably foreseeable future actions, there would be minor short-term adverse cumulative impacts and long-term negligible to minor adverse cumulative impacts as well as some long-term beneficial cumulative impacts. This alternative would contribute minimally to those impacts.

#### Alternative 2: Moderate Change

The renovation activities at the Visitor Center/Museum and the Old Courthouse would limit visitor, researcher, and staff access to collections as portions would be moved or put into storage. This limited access to various exhibits and collections would be temporary as the collections would be returned to exhibition and storage locations after the completion of renovations.

The proposed renovations to the Visitor Center/Museum would remedy existing electrical and HVAC limitations to help improve climate control for the collections. This would help to preserve the integrity of the museum collections. The proposed

renovations could also provide easier access to the collections to help facilitate their management, preservation, interpretation, and research. Proposed changes at the Old Courthouse include renovations of the galleries and spaces on the first and second floors and would also provide improved building systems that could help improve climate control to better preserve collections held there.

Under alternative 2, the temporary disruption to visitor, researcher, and staff access to the collections would cause short-term minor adverse impacts as the collections would continue to be protected and managed by staff while in storage or in alternate locations and visitor and researcher access would be only be limited temporarily, with access to the collections provided as feasible. The improvements in climate control, the renovation of existing collections spaces within the Visitor Center/Museum and the Old Courthouse, the improved access to the collections, and updated space for collections management, preservation, and interpretation would help to preserve the long-term usefulness of the collections for research and interpretation and would result in long-term beneficial impacts to museum collections.

#### Cumulative Impacts for Alternative 2

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on museum collections include the same projects discussed above under alternative 1, the no-action alternative. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 2, such as the Visitor Center/Museum roof replacement and repairs and renovations of the Old Courthouse. This coordination would serve to lessen the short-term impacts of each project occurring on its own.

Alternative 2, as noted above, would result in short-term minor adverse and long-term beneficial impacts to museum collections. Combined with other past, present, and reasonably foreseeable future actions, there would also be short-term minor adverse and

long-term beneficial cumulative impacts. Alternative 2 would contribute somewhat considerably to impacts on museum collections.

#### Alternative 3: Maximum Change

Under alternative 3, during construction activities for renovations and the addition of new space at the Visitor Center/Museum and renovations at the Old Courthouse, access to collections would be limited and exhibits would be moved or put in storage. This limited access to various exhibits and collections would be temporary as the collections would be returned to exhibition and storage locations after the completion of construction.

Proposed actions include the renovation of existing space and the addition of new space within the Visitor Center/Museum and renovation of galleries on the first and second floors of the Old Courthouse. The renovations and increased museum collection space at the Visitor Center/Museum would remedy existing electrical and HVAC limitations to help improve climate control for the collections. This would help to preserve the integrity of the museum collections. The proposed renovations and new Visitor Center/Museum space would provide easier access to the collections for management, preservation, interpretation, and research. The addition of the West Entrance would introduce some natural light into the Visitor Center/Museum and the placement and types of museum collections exhibits and storage would take this into account in order to properly protect collections. The renovation of galleries on the first and second floors of the Old Courthouse would provide improved building systems that could help improve climate control to better preserve the collections held there.

During construction of alternative 3, the temporary disruption to visitor, researcher, and staff access to the collections would cause short-term minor adverse impacts as the collections would continue to be protected and managed by staff while in storage or in alternate locations and visitor and researcher access would be only be limited temporarily,

with access to the collections provided as feasible. The improvements in climate control, the updated and increased space for collections in the Visitor Center/Museum and renovated space in the Old Courthouse, the improved access to the collections, and improved space for collections management, interpretation, and preservation would help to preserve the long-term usefulness of the collections for research and interpretation and would result in long-term beneficial impacts to museum collections.

#### Cumulative Impacts for Alternative 3

Past, ongoing, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on museum collections include the same projects discussed above under alternative 1, the no-action alternative. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 3, such as the Visitor Center/Museum roof replacement and repairs and renovations of the Old Courthouse. This coordination would serve to lessen the short-term impacts of each project occurring on its own.

Alternative 3, as noted above, would result in short-term minor adverse and long-term beneficial impacts to museum collections. Combined with other past, present, and reasonably foreseeable future actions, there would also be short-term minor adverse and long-term beneficial cumulative impacts. Alternative 3 would contribute somewhat considerably to impacts on museum collections.

## NATURAL RESOURCES

### VEGETATION

#### Methodology for Assessing Impacts

Available information on the vegetation was compiled and reviewed. Impacts on vegetation were based on general characteristics of the site and vicinity, site observations, previous studies on the health of park vegetation and potential threats, and proposed encroachment into vegetated areas associated with the proposed construction and project elements.

#### Study Area

The study area for the inventory and analysis of vegetation is the area encompassed by the park's boundaries. The study area also includes the area along the Central Riverfront adjacent to the levee and the Mississippi River, between Biddle Street and Chouteau Avenue.

#### Impact Thresholds

The thresholds of change for the intensity of an impact on vegetation are as follows:

**Negligible:** Very few individual trees, mature landscape plantings, or turf would be affected.

**Minor:** A few individual trees and mature landscape plantings, or a small amount of turf would be affected. Mitigation measures such as replanting to avoid or offset impacts on trees could be implemented and would be effective in replacing or reducing losses of vegetation.

**Moderate:** A relatively large number of individual trees, mature landscape plantings, or turf would be affected. Mitigation measures such as replanting to avoid or offset impacts on trees and other landscaping of greater concern could be implemented and would be effective in replacing or reducing losses of vegetation, but extended time may be needed for the regeneration of lost mature vegetation.

**Major:** A substantial volume of individual trees, mature landscape plantings, and turf would be affected, and numerous older mature trees would also be impacted, either directly or indirectly. Actions would substantially change the vegetation over a large area in the study area. Extensive mitigation would be needed to offset adverse impacts, and its success would not be assured.

**Duration:** Short-term impacts would occur during construction and would take less than one year to recover after the disturbance or change occurs; long-term impacts would occur or continue after construction is complete.

#### Impacts of the Alternatives

##### Alternative 1: No-Action Alternative

Under alternative 1, MoDOT would construct the Park Over the Highway structure over I-70, as discussed in Cumulative Impacts. The National Park Service would landscape the surface of the structure after completion of MoDOT's construction. Grading, planting, and landscaping staging activities at the West Gateway and on the eastern side of Luther Ely Smith Square would temporarily disturb and remove some vegetation, primarily turf grass, in these locations. Upon completion of construction, grassed areas would be re-vegetated.

Due to its location in an urban park, the park vegetation undergoes daily wear and tear and the turf grass lawn is heavily used. This wear and tear is expected to continue through normal visitor use. In areas of the park where special events are held, high levels of pedestrian foot traffic occur in vegetated areas. Vegetation would be maintained in accordance with current practices that were developed as a routine maintenance program for the rehabilitation of damaged or degraded vegetation that is described in the Landscape Preservation Maintenance Plan (NPS 2010b). The surface on the Park Over the Highway structure would be landscaped and would increase the amount vegetative area in the park, which would be maintained as part of the park's maintenance program.

As the park's vegetation is comprised of a formally planned landscape, impacts to the landscape design are analyzed in this EA under Cultural Landscapes. Overall, under alternative 1, there would be short-term minor adverse impacts to vegetation in the park during construction and while the vegetation matures along the Park Over the Highway and negligible long-term impacts to vegetation in the park and along the Central Riverfront as these areas would remain largely unchanged. There would also be long-term beneficial impacts to vegetation due to the increase in vegetative surface on the Park Over the Highway.

#### Cumulative Impacts for Alternative 1

Past, present, and reasonably foreseeable future projects within the area of the Jefferson National Expansion Memorial that have potential impacts on vegetation include:

- Visitor Center/Museum roof replacement
- Repair North and South Overlook stairs
- Construction of the Park Over the Highway structure

These projects would require construction activities that would disturb vegetation in the park. Replacement of the Visitor Center/Museum roof would require the removal of the turf grass lawn covering the existing Visitor Center/Museum. The lawn would be re-vegetated when construction is complete. The demolition and construction required to repair the North and South Overlook stairs would remove some existing vegetation adjacent to the Overlook steps, which would be replaced following completion of the construction process. The construction of the Park Over the Highway structure over I-70 would disturb vegetation at Luther Ely Smith Square and the West Gateway. Turf grass and a limited number of trees would be removed due to demolition, excavation, grading, and staging of construction equipment. Best management practices would be implemented during construction of these projects to protect existing vegetation. Upon completion of construction, grassed areas would be re-vegetated and trees would be replaced.

As described above, short-term minor adverse impacts would occur to vegetation due to temporary disturbances during the implementation of a planted landscape across the Park Over the Highway under alternative 1. There would be long-term negligible impacts as the regular maintenance and the park and existing conditions along the Central Riverfront would continue and long-term beneficial impacts would occur due to the addition of landscaped area in the park. Combined with other past, present, and reasonably foreseeable future actions, there would be a short-term moderate adverse cumulative impacts and long-term minor adverse cumulative impacts to vegetation. Long-term beneficial impacts would also occur. However, this alternative would contribute minimally to these impacts.

#### Alternative 2: Moderate Change

During construction, various project elements in alternative 2 would disturb or remove a relatively large number of trees, landscape plantings, and turf. These project elements include perimeter security, site grading for pedestrian accessibility elements, grading for drainage improvements and stormwater management, installation of utilities, streetscape improvements at the Old Courthouse, grading at Luther Ely Smith Square and the West Gateway to landscape the new plaza at Luther Ely Smith Square and the Park Over the Highway structure over I-70, replacement in-kind of the Processional Walks, and the replacement of some existing vegetation with other species and types. Construction along the Central Riverfront would remove the existing street trees. Construction projects would be coordinated and phased to limit the time and amount of vegetation disturbed by overlapping projects where feasible. After construction, areas disturbed by construction activities would be re-vegetated.

Several project elements in alternative 2 would alter or remove existing vegetation once completed. The grading and excavation on the East Slopes for new paved ramps to the riverfront and near the Arch legs for paved

ramps into the Visitor Center/Museum would permanently remove a limited amount of vegetation to accommodate the ramps. The Rosehill ash trees in the park and along the Processional Walks would be replaced under this alternative with a species selected by the NPS in accordance with the approved EAB EA (NPS 2011b). A portion of the grass lawn in Luther Ely Smith Square would be replaced with a paved surface in order to create a large plaza.

The planting plan in alternative 2 proposes the use of various types of vegetation that would decrease maintenance issues, increase the health of the vegetation, and increase the diversity of vegetation on the park grounds. Alternative 2 would implement soil amendment strategies to mitigate existing soil deficiencies to promote vegetation health and would augment these with additional planting soil as needed. High-use turf would be planted in areas where moderate to heavy visitor use is expected in order to reduce bald patches in lawn surfaces, including at the West Gateway from Luther Ely Smith Square and extending underneath the Arch as well as along the interior of the Processional Walks.

Additional plantings would be added to the North Gateway around the Arch Parking Garage and at the northwest intersection where feasible. Trees and other vegetation would be added to Luther Ely Smith Square and across the Park Over the Highway structure over I-70. Additional understory and canopy trees would be added around the park, increasing the amount of vegetation in the park. New street trees would be planted along the Central Riverfront as part of the pedestrian promenade. This alternative would raise the elevation of Leonor K. Sullivan Boulevard, which could help to protect vegetation along the Central Riverfront from seasonal flooding events associated with the Mississippi River.

Short-term moderate adverse impacts would occur during construction of project elements that would disturb or remove a relatively large number of trees, landscape plantings, and turf; however, construction and staging would be phased and coordinated and existing trees would remain wherever possible. The

permanent removal of a limited amount of vegetation would cause long-term minor adverse impacts. Some new vegetation would be added to the park, which would require time to mature, and would result in long-term beneficial impacts. Long-term beneficial impacts due to an increase in the health of vegetation as well as diversified planting types would also occur.

#### Cumulative Impacts for Alternative 2

Past, present, and reasonably foreseeable future projects within the area of the Jefferson National Expansion Memorial that have potential impacts on vegetation include the same projects discussed under alternative 1, the no-action alternative, earlier in this chapter. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 2, such as the Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs. This coordination would serve to lessen the short-term impacts of each project occurring on its own; however, the amount of vegetation disturbance would be greater in this alternative than under alternative 1.

Alternative 2, as noted above, would disturb or remove vegetation during construction and the implementation of project elements and would result in moderate short-term and minor long-term adverse impacts to vegetation. Beneficial impacts would also occur. Combined with other past, present, and reasonably foreseeable future actions, there would be cumulative moderate short-term and minor long-term adverse impacts and long-term beneficial impacts. Actions directly related to alternative 2 would contribute somewhat to impacts on vegetation.

#### Alternative 3: Maximum Change

As in alternative 2, construction of various project elements in alternative 3 would disturb or remove a relatively large number of trees, landscape plantings, and turf. These project elements include those listed in alternative 2, as well as the addition of the

West Entrance to the Visitor Center/Museum, the demolition of the Arch Parking Garage, and the installation of the Explorers Garden in the North Gateway. Construction projects would be coordinated and phased to limit the time and amount of vegetation disturbed by overlapping projects where feasible. These areas would be re-vegetated after completion of construction.

Project elements described in alternative 2 which would alter or remove existing vegetation once completed would also occur under alternative 3. In addition to those elements, a small portion of the park's turf grass would be removed under alternative 3 by a paved entry that would be installed at the western edge of the park in the West Gateway to facilitate the West Entrance to the Visitor Center/Museum. The planting plan in alternative 3 is similar to the plan described in alternative 2. Under alternative 3, the removal of the Arch Parking Garage would create additional vegetated acreage, increasing the amount of vegetation in the park. Plantings in the North Gateway would encourage the use of identified paths to traverse the park, reducing the potential for the formation of social trails. New vegetation would be installed along the segments of Washington Avenue that would be closed to vehicular traffic and converted to parkland. The Explorers Garden would include additional trees and other plantings, would capture stormwater runoff, and would feature plantings to serve as educational tools and support native biodiversity, such as illustrating the botanical aspects of Lewis and Clark's journey. Trees and other vegetation would also be added to Luther Ely Smith Square and across the Park Over the Highway over I-70 to create shade gardens, and additional understory and canopy trees would be added around the park, increasing the amount of vegetation in the park.

As in alternative 2, new street trees would be planted along the Central Riverfront and the elevation of Leonor K. Sullivan Boulevard would be raised to limit seasonal flooding. These efforts could help protect vegetation along the Central Riverfront.

Short-term moderate adverse impacts would occur during construction of project elements that would temporarily disturb or remove a relatively large number of trees, landscape plantings, and turf; however, construction and staging would be phased and coordinated and existing trees would remain wherever possible. While some vegetation would be permanently removed in limited areas of the park and new vegetation would require time to mature, overall long-term beneficial impacts would occur due to a substantial increase in vegetation in the park at Luther Ely Smith Square and the new West Entrance as well as at the North Gateway where the Arch Parking Garage and the through traffic portions of Washington Avenue would be removed and the areas re-vegetated. Beneficial impacts would also stem from an increase in the health of vegetation and diversified planting types.

#### Cumulative Impacts for Alternative 3

Past, present, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on vegetation include the same projects discussed under alternative 1, the no-action alternative. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 3, such as the Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs. This coordination would serve to lessen the short-term impacts of each project occurring on its own; however the amount of vegetation disturbance would be greater in this alternative than under alternative 1. Alternative 3 would cause slightly more disturbance than in alternative 2, but alternative 3 would add a greater amount of newly vegetated area.

Alternative 3, as noted above, would disturb or remove vegetation during construction and the implementation of project elements and would result in moderate short-term and minor long-term adverse impacts to vegetation. Long-term beneficial impacts would also occur. Combined with other past, present, and reasonably foreseeable future actions, there would be cumulative moderate

short- and long-term adverse impacts and long-term beneficial impacts. Actions directly related to alternative 3 would contribute somewhat considerably to impacts on vegetation.

## SOUNDSCAPE

### Methodology for Assessing Impacts

The impacts of each alternative on the soundscape of the park were assessed qualitatively by evaluating the noise generated from construction, noise generated from the operation of various project components, and the noise reduction potential of certain design elements.

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.

### Study Area

The study area for the inventory and analysis of soundscape is the park grounds, bounded by Eads Bridge to the north, Leonor K. Sullivan Boulevard to the east, Poplar Street Bridge to the south, and Interstate 70 to the west, plus a two-block extension to incorporate the Old Courthouse and Luther Ely Smith Square. The study area also includes the area along the central riverfront adjacent to the levee and the Mississippi River, between Biddle Street and Chouteau Avenue. All impacts on the soundscape are assumed to be local impacts that affect only the immediate area of the noise source.

### Impact Thresholds

Impact thresholds are as follows:

**Negligible:** The noise generated during construction or operation is not above background noise levels.

**Minor:** The noise generated during construction or operation is sometimes above background noise levels.

**Moderate:** The noise generated during construction or operation is typically above background noise levels, but remains below levels established by regulatory guidelines.

**Major:** The noise generated by the construction or operation of the proposed elements is frequently above background noise levels and exceeds levels established by regulatory guidelines.

**Duration:** Short-term impacts would occur during construction. Long-term impacts would occur during operations after construction is complete.

### Impacts of the Alternatives

#### Alternative 1: No-Action Alternative

Under alternative 1, MoDOT would construct the Park Over the Highway structure over I-70, as discussed in Cumulative Impacts. The National Park Service would landscape the surface of the structure after completion of MoDOT's construction. Intermittent noise generated by motorized construction equipment utilized for grading and planting activities at the West Gateway and on the eastern side of Luther Ely Smith Square would temporarily disturb the park's soundscape.

Routine maintenance activities at the park including lawn mowing and other noise-generating landscaping activities, as well as emergency generator testing and trains passing through the railroad tunnels would continue. The noise generated by these activities would be above background noise levels and therefore perceptible within the park. Along the Central Riverfront, noise generating activities and infrastructure would not be added and existing conditions would remain. Noise generating activities and infrastructure would not be added under alternative 1.

Construction-related impacts under the no-action alternative would result in short-term minor adverse impacts from noise generated by grading and planting activities at the West Gateway and Luther Ely Smith Square, which would be intermittently perceptible above background conditions

and would temporarily disturb the park's soundscape. The continuation of existing operational conditions with occasional noises above background conditions would cause long-term minor adverse impacts to the park's soundscape.

#### Cumulative Impacts for Alternative 1

Past, present, and reasonably foreseeable future projects within the area of the Jefferson National Expansion Memorial that have potential impacts on soundscape include:

- Old Courthouse Renovations and Repairs
- Eads Bridge Restoration
- Mississippi River Bridge
- Visitor Center/Museum roof replacement
- Repair North and South Overlook stairs
- Construction of the Park Over the Highway structure
- Emerald Ash Borer Environmental Assessment
- Poplar Street Bridge improvements

Overall, noise generated by construction activities from each of the projects listed above would be greatest in the immediate vicinity of the construction activity and would diminish with distance from the activity. The Old Courthouse renovations and repairs, the Eads Bridge restoration and structural rehabilitation, and the Mississippi River Bridge construction are ongoing. The replacement of the roof on the underground Visitor Center/Museum and the repair of the North and South Overlook stairs are deferred maintenance projects that would occur as funding permits. The replacement of the Rosehill ash trees would be completed in phases and according to the approved EAB EA (NPS 2011b) after detection of the emerald ash borer. Noise generated from these projects would include motorized and non-motorized construction equipment used for demolition, excavation, grading,

tree removal, and building and repairing the structures.

Construction of the Park Over the Highway structure over I-70 and the Poplar Street Bridge improvements would require motorized and non-motorized construction equipment for activities such as demolition, excavation, grading, and structural construction, all of which would generate noise. Upon completion of the Park Over the Highway structure, it could help to attenuate noise from vehicular traffic within the park by adding a barrier between the park and the depressed section of I-70 between Market Street and Chestnut Street. Construction noise generated from these projects would have short-term moderate adverse impacts to the soundscape within the park. Upon completion of both project, long-term impacts to soundscapes would be negligible, and possibly beneficial.

The no-action alternative, as noted above, would result in minor short- and long-term adverse impacts to soundscapes due to construction activities related to the landscaping of the Park Over the Highway and Luther Ely Smith Square and the ongoing operational noises produced at the park. Combined with other past, present, and reasonably foreseeable future actions, there would be a short-term moderate adverse cumulative impacts to soundscapes. Long-term cumulative impacts to soundscapes would be negligible and possibly beneficial; alternative 1 would contribute minimally to those impacts.

#### Alternative 2: Moderate Change

During construction of the project elements in alternative 2, activities such as excavation and grading, construction of pedestrian paths and ramps, perimeter security elements, the replacement of the Rosehill ash trees and Processional Walks, renovation activities, and construction to raise the elevation of, and create pedestrian and bicycle paths on, Leonor K. Sullivan Boulevard would take place. Motorized and non-motorized construction equipment used during these activities would be intermittently perceptible above background levels within the park.

Construction of project elements would be coordinated and phased, which would help to limit multiple concurrent sources of construction-generated noise. Noise generated by construction activities would be greatest in the immediate vicinity of the activity, would diminish with distance, and would comply with City of St. Louis noise regulations.

Routine maintenance activities at the park including lawn mowing, landscaping and other noise-generating activities, and emergency generator testing would continue. The noise generated by these activities would be above background noise levels and therefore perceptible within the park. Alternative 2 would not add additional noise-generating operational activities or infrastructure within the park.

The slopes planted with trees and other vegetation along the Park Over the Highway could help to attenuate traffic noise from I-70 by buffering the park from vehicular noises in the depressed section of I-70. Along the Central Riverfront, additional activities and special events could create new sources of noise; however, these noises would be similar to existing noises within the park and would be compatible with the use of the area. Noise generating infrastructure would not be added to the Central Riverfront.

Construction-related impacts under alternative 2 would result in short-term moderate adverse impacts from intermittent noise above background conditions that would be generated by excavating, grading and planting activities to implement project elements, which would temporarily disturb the park's soundscape. The continuation of existing operational conditions with occasional noises above background conditions would cause long-term minor adverse impacts to the park's soundscape. The potential sound attenuation from landscape additions to the park would create long-term beneficial impacts by reducing noise intruding on the park's soundscape.

#### Cumulative Impacts for Alternative 2

Past, present, and reasonably foreseeable future projects within the area of the Jefferson National Expansion Memorial that have potential impacts on soundscapes include the same projects discussed under alternative 1, the no-action alternative. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 2, such as the Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs. As such, construction activities could be coordinated and phased and could lessen the short-term impacts of the projects; however, alternative 2 would generate more noise associated with construction than alternative 1

Alternative 2, as noted above, would result in short-term moderate adverse impacts and long-term minor adverse impacts to soundscapes due to construction activities and ongoing operational noises at the park. Beneficial impacts would also occur due to vegetation acting as a noise buffer between the park and a portion of the depressed section of I-70. Combined with other past, present, and reasonably foreseeable future actions, there would be short-term moderate adverse cumulative impacts, long-term minor adverse cumulative impacts and some beneficial impacts. Actions directly related to alternative 2 would have limited contributions to impacts on soundscapes.

#### Alternative 3: Maximum Change

The same noise-producing construction activities discussed in alternative 2 would also occur in alternative 3. In addition, the construction of the new West Entrance to the Visitor Center/Museum and the demolition of the Arch Parking Garage would occur. Motorized and non-motorized equipment used during construction would be intermittently perceptible above background levels within the park. Construction of project elements would be coordinated and phased which would help to limit multiple concurrent

sources of construction-generated noise. Noise generated by construction activities would be greatest in the immediate vicinity of the activity, would diminish with distance, and would comply with City of St. Louis noise regulations. Operational activities at the park described in alternative 2, including routine maintenance activities and emergency generator testing, would continue. Alternative 3 would not add additional noise-generating activities or infrastructure.

Slopes with plantings of canopy trees, shrubs, and groundcover would create planted shade gardens along the Park Over the Highway structure over I-70, which could help to attenuate traffic noise from I-70 by acting as a buffer between the park and a portion of the depressed highway. The removal of the Arch Parking Garage and the vehicular through-lanes of Washington Avenue adjacent to the park at the North Gateway would direct most automobile traffic in the North Gateway away from park visitor areas and could reduce vehicular noise. Additional plantings would be added at the North Gateway after the removal of the Arch Parking Garage and could attenuate some noise from Laclede's Landing and Eads Bridge.

Construction-related impacts under the alternative 3 would result in short-term moderate adverse impacts from intermittent noise above background conditions that would be generated by excavating, grading and planting activities to implement project elements, which would temporarily disturb the park's soundscape. The continuation of existing operational conditions with occasional noises above background conditions would cause long-term minor adverse impacts to the park's soundscape. The potential sound attenuation from landscape additions to the park and removal of vehicular traffic noise sources in the North Gateway would create long-term beneficial impacts by reducing noise intruding on the park's soundscape.

#### Cumulative Impacts for Alternative 3

Past, present, and reasonably foreseeable future projects within the area of the Jefferson National Expansion Memorial that have

potential impacts on soundscapes include the same projects discussed under alternative 1, the no-action alternative. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 3, such as the Visitor Center/ Museum roof replacement and repair of the North and South Overlook stairs. As such, construction activities could be coordinated and phased and could lessen the short-term impacts of the projects; however, alternative 3 would generate more noise associated with construction than alternatives 1 and 2.

Alternative 3, as noted above, would result in short-term moderate adverse impacts and long-term minor adverse impacts to soundscapes due to construction activities and ongoing operational noises at the park. Beneficial impacts would also occur due to vegetation acting as a noise buffer between the park and a portion of the depressed section of I-70. Combined with other past, present, and reasonably foreseeable future actions, there would be short-term moderate adverse cumulative impacts, long-term minor adverse cumulative impacts and some beneficial impacts. Actions directly related to alternative 3 would have limited contributions to impacts on soundscapes.

## FLOODPLAINS

### Methodology for Assessing Impacts

Floodplains are defined by the NPS Procedural Manual 77-2: Floodplain Management (NPS 2003) as "the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, and including, at a minimum, that area subject to temporary inundation by a regulatory flood." Executive Order 11988: "Floodplain Management" requires an examination of impacts on floodplains and of the potential risk involved in placing facilities within floodplains as well as the protection of floodplain values. The NPS has adopted the policy of preserving floodplain values and minimizing potentially hazardous conditions associated with flooding (NPS 2003).

A portion of the proposed project would be constructed within an existing regulatory

floodplain. As such, impacts on floodplain functions and values were assessed. These assessments were based on the known and potential 100-year floodplains within the study area, information provided by experts in the NPS and other agencies, and professional judgment.

### Study Area

The study area for the inventory and analysis of floodplains is the area within the floodplain along the Central Riverfront adjacent to the levee and the Mississippi River, between Biddle Street and Chouteau Avenue.

### Impact Thresholds

The following thresholds were used to determine the degree of impacts on floodplains in the project area.

**Negligible:** Impacts would result in a change to floodplain functions and values, but the change would be so slight that it would not be of any measurable or perceptible consequence.

**Minor:** Impacts would result in a detectable change to floodplain functions and values, but the change would be expected to be small, and of little consequence. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

**Moderate:** Impacts would result in a change to floodplain functions and values that would be readily detectable, measurable, and consequential. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful.

**Major:** Impacts would result in a substantial change to floodplain functions and values. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

**Duration:** Short-term impacts would occur during construction or sporadically

**NO-RISE CERTIFICATION –** Section 60.3 (d) (3) of the National Flood Insurance Program (NFIP) regulations states that a community shall “prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base (100-year) flood discharge.” This “no-rise” certification must be obtained prior to activity in a regulatory floodway.

throughout the course of a year. Long-term impacts would occur after completion of construction and would last more than one year.

### Impacts of the Alternatives

#### Alternative 1: No-Action Alternative

Under alternative 1, there would be no disturbance to any floodplains. Therefore, the alternative would not result in any changes to the functions or values of the current designated floodplains in the project area. There would be no short- or long-term impacts to floodplains in alternative 1.

#### Cumulative Impacts for Alternative 1

Because there would be no impacts on floodplain functions or values under the no-action alternative, no cumulative impacts would occur.

#### Alternative 2: Moderate Change

Alternative 2 would include project elements in the designated 100-year floodplain, which is described in the Natural Resources section of the Affected Environment chapter

(see Figure 30). The elevation of Leonor K. Sullivan Boulevard would be raised as a strategy to reduce the frequency and impact of flood events that just overtop Leonor K. Sullivan Boulevard on Central Riverfront infrastructure and activities. These flood occurrences can last up to two weeks, cause the closure of Leonor K. Sullivan Boulevard, and are more frequent than the larger 100-year flood events that close the floodgates. Raising the elevation of Leonor K. Sullivan Boulevard would require modifications to the floodwall and levee system along the Mississippi River. Modifications to floodwall closure structures at Chouteau Avenue, Poplar Street, and Carr Street would be required. This work would include raising the sills of the closure structures and modifications to the closure structure panel systems at each location. Additionally, raising Leonor K. Sullivan Boulevard would require the placement of fill against existing structures within the public right-of-way as well as construction of new retaining walls along the levee. Two lanes of vehicular traffic would be maintained, a bicycle trail and pedestrian promenade would be installed along the existing width of Leonor K. Sullivan Boulevard, and paved paths to the riverfront would be installed on the East Slopes.

Although development in the 100-year floodplain would occur, floodplain values would be protected to the maximum degree possible and the extent of development, placement of structures, and types of structures would be selected to minimize impacts. The East Slopes would remain vegetated, with some loss to accommodate the addition of paved paths to the riverfront. However, this would not change the nature of the development in the floodplain. The functions and values of the floodplain along the Central Riverfront would remain unchanged.

The City of St. Louis is a member of the National Flood Insurance Program (NFIP) and must adhere to the NFIP's regulations concerning development within the floodplain and particularly the floodway. Because fill would be placed into the floodplain and floodway, a "no-rise"

analysis and a "no-rise" certificate would be required to assure the City of St. Louis and the NFIP that all floodplain regulations are in compliance and that the development would not increase base flood heights. A Riverine Hydraulic Analysis of the proposed project elements must be completed prior to development in the floodplain to ensure that a "no-rise" to the 100-year base flood elevation would exist after construction of the proposed project elements. As a result, the project would be designed to minimize the number of flood events that close the roadway, but would not affect the 100-year flood base elevations.

Construction-related activities under alternative 2 would not change floodplain functions or values and no short-term impacts would occur. The "no-rise" analysis and certificate would ensure that no long-term adverse impacts to the 100-year designated floodplain would occur. The raised elevation of Leonor K. Sullivan Boulevard and the addition of pedestrian and bicycle paths would have negligible long-term impacts to floodplains as they would not alter the nature of the development in the floodplain and the functions and values of the floodplain along the Central Riverfront would remain unchanged.

#### Cumulative Impacts for Alternative 2

Past, present, and reasonably foreseeable future projects within the area of the Jefferson National Expansion Memorial that have potential impacts on floodplains include:

- Mississippi River Bridge

Construction of the Mississippi River Bridge is ongoing and is located to the north of the park and the Central Riverfront. According to the Mississippi River Crossing FEIS, impacts from the bridge on the Mississippi River floodplain during the base flood event would affect only storage, and not conveyance, and can be mitigated by providing compensatory storage using roadside ditches along the affected areas (IDOT and MoDOT 2001). The project's compensatory flood storage areas would be designed to ensure no rise in the base flood elevation (100-year flood), or one

or more Conditional Letters of Map Revision would be obtained in accordance with federal and state guidelines.

As noted above, under alternative 2 long-term impacts to floodplains would be negligible. Combined with other past, present, and reasonably foreseeable future actions, long-term cumulative impacts would be negligible. This alternative would contribute minimally to those impacts.

#### Alternative 3: Maximum Change

The proposed changes to the East Slopes and Central Riverfront described under alternative 2 would also be implemented under alternative 3. As in alternative 2, floodplain values would be protected to the maximum degree possible and the extent of development, placement of structures, and types of structures would be selected to minimize impacts. The proposed actions in alternative 3 would not change the nature of the development in the floodplain and the functions and values of the floodplain along the Central Riverfront would remain unchanged. A “no-rise” analysis and a “no-rise” certificate would be required to assure the City of St. Louis and the NFIP that all floodplain regulations are in compliance and that the development would not increase base flood heights.

Construction-related activities under alternative 3 would not change floodplain functions or values and no short-term impacts would occur. The raised elevation of Leonor K. Sullivan Boulevard and the addition of pedestrian and bicycle paths would have negligible long-term impacts to floodplains as they not alter the nature of the development in the floodplain and the functions and values of the floodplain along the Central Riverfront would remain unchanged.

#### Cumulative Impacts for Alternative 3

Past, present, and reasonably foreseeable future projects within the area of the Jefferson National Expansion Memorial that have potential impacts on floodplains are the same projects discussed under alternative 2.

As noted above, like alternative 2, long-term negligible impacts to floodplains would occur under alternative 3. Combined with other past, present, and reasonably foreseeable future actions, long-term cumulative impacts would be negligible. This alternative would contribute minimally to those impacts.

## WATER RESOURCES

### Methodology for Assessing Impacts

For the purposes of this document, the term “water resources” is inclusive of the water supply (or source), water quality, and stormwater management. The NPS Management Policies 2006 states that the NPS will “take all necessary actions to maintain or restore the quality of surface waters and ground waters within the Parks, consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations” (NPS 2006).

A water quality standard defines the water quality goals of a water body by designating uses to be made of the water, setting minimum criteria to protect the uses, and preventing degradation of water quality through anti-degradation provisions. The anti-degradation policy is only one portion of a water quality standard. Part of this policy (40 CFR 131.12(a)[2]) strives to maintain water quality at existing levels if it is already better than the minimum criteria. Anti-degradation should not be interpreted to mean that “no degradation” can or will occur, as even in the most pristine waters, degradation may be allowed for certain pollutants as long as it is temporary and short-term.

Potential impacts of actions comprising the alternatives often cannot be defined relative to site-specific locations. Consequently, water resource impacts of the alternatives were assessed qualitatively.

### Study Area

The geographic study area for water resources, water quality, and stormwater management includes the area encompassed by the park’s boundaries and the Central Riverfront. This includes the North and South

Reflecting Ponds and the Mississippi River in the vicinity of the project.

### Impact Thresholds

The following thresholds were used to determine the magnitude of impacts on waters resources and water quality.

**Negligible:** Impacts on water resources would not be readily measurable or detectable and would be within historical or desired water quality conditions.

**Minor:** Impacts on water resources would be small, detectable, and measurable, but would be within historical or desired water quality conditions.

**Moderate:** Impacts on water resources would be easily detectable. Historical or desired water quality conditions would be temporarily altered.

**Major:** Impacts on water resources would be substantial and obvious. The historical or desired water quality conditions would be altered.

**Duration:** Short-term impacts would occur during construction and would take less than one year to recover after the disturbance or change occurs; long-term impacts would occur or continue after construction is complete.

### Impacts of the Alternatives

#### Alternative 1: No-Action Alternative

Under alternative 1, MoDOT would construct the Park Over the Highway structure over I-70, as discussed in Cumulative Impacts. The NPS would landscape the surface of the structure after completion of MoDOT's construction. Construction activities such as grading and planting at the West Gateway and on the eastern side of Luther Ely Smith Square would temporarily disturb soils, creating an increased potential for soil erosion and/or transport of surface pollutants via stormwater runoff into adjacent water bodies and storm sewers. An erosion and sediment control plan would be developed prior to construction

**STORMWATER RUNOFF** is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground. As the runoff flows over the land or impervious surfaces (paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the runoff is discharged untreated.

in order to reduce erosion of exposed soils, slow the rate at which water leaves the site, and capture eroded soils and concentrated nutrients before entering adjacent storm sewers or the Mississippi River.

Alternative 1 would not alter the existing stormwater management conditions. Existing pervious surfaces on the site, such as turf grass and other vegetated areas would continue to absorb water at their respective varying rates. Stormwater would continue to be collected in the north and south reflecting ponds and would also continue to drain into the storm sewer system and to the Mississippi River. Stormwater runoff from Leonor K. Sullivan Boulevard would continue to flow untreated into the Mississippi River, either directly from Leonor K. Sullivan Boulevard or via inlets and drains that feed into a portion of the storm sewer system that outflows directly into the Mississippi River. During storm events, pollutants and sediment from roadways and surrounding urban development would continue to contaminate stormwater runoff from the project area, negatively affecting water quality.

Construction-related impacts under the no-action alternative would result in short-term minor adverse impacts to water quality as disturbed soils and altered stormwater flows could create an increased potential for soil erosion and transport of surface pollutants into adjacent water bodies and storm sewers. As the site would continue to operate under current conditions, pollutants in stormwater runoff would enter the

Mississippi River during storm events and long-term minor adverse impacts to water resources and water quality would occur.

#### Cumulative Impacts for Alternative 1

Past, present, and reasonably foreseeable future projects within the area of the Jefferson National Expansion Memorial that have potential impacts on water resources include:

- Visitor Center/Museum roof replacement
- Repair North and South Overlook stairs
- Construction of the Park Over the Highway structure
- Metropolitan St. Louis Sewer District Improvements
- Emerald Ash Borer Environmental Assessment

The replacement of the roof on the underground Visitor Center/Museum and the repairs to the North and South Overlook stairs are deferred maintenance projects that would occur in the future as funding permits. The replacement of the Rosehill ash trees would be completed in phases and according to the approved EAB EA (NPS 201b) after detection of the emerald ash borer. The construction of the Park Over the Highway structure over I-70 would occur as part of MoDOT's transportation infrastructure changes in the vicinity of the park. Demolition, excavation, and site grading performed to complete these projects would disturb soils and alter existing stormwater flows during construction, creating an increased potential for soil erosion and/or transport of surface pollutants via stormwater runoff into adjacent water bodies and storm sewers. Best management practices would be implemented during construction to minimize soil erosion and slow the rate at which water leaves the site. These construction projects would be coordinated as necessary.

The Metropolitan St. Louis Sewer District Improvements would upgrade the system's sewer systems and treatment plants as well as implement large scale green infrastructure

projects. This would help to reduce pollution levels in urban rivers and streams across the district, including the Mississippi River in the vicinity of the park.

The no-action alternative, as noted above, would result in minor short- and long-term adverse impacts to water resources. Combined with past, present, and reasonably foreseeable future projects, there would be short- and long-term minor adverse cumulative impacts to water resources. Long-term beneficial impacts would also occur; however this alternative would contribute minimally to those impacts.

#### Alternative 2: Moderate Change

During construction, excavation, grading, and the replacement of some existing vegetation would temporarily disturb soils and alter existing stormwater flows, creating an increased potential for soil erosion and/or transport of surface pollutants via stormwater runoff into adjacent water bodies and storm sewers. Best management practices, as described in the Alternatives chapter Mitigation Measures section, would be implemented during construction to minimize soil erosion, slow the rate at which water leaves the site, and capture eroded soils and concentrated nutrients before entering the Mississippi River and adjacent storm sewers. These best management practices would include an erosion and sediment control plan that would be developed prior to construction. Construction projects would be coordinated to minimize soil disturbance.

In alternative 2, there would be an increase in vegetation on site, both in area and amount, which would increase water usage for irrigation. Plantings and landscape treatments, such as conservation mown areas and drought-tolerant plant species, would be installed on the park grounds and could help reduce the need for irrigation which would reduce surface runoff and the use of potable water for irrigation purposes. Any irrigation systems that would require replacement under alternative 2 would utilize current technology to reduce potable water usage. A landscape maintenance regime could include organic treatments, which would reduce the

need for the use of pesticides and fertilizers. This would help to improve the water quality in the reflecting ponds and could reduce algal blooms in the ponds, which are used to hold stormwater runoff from the park grounds.

Various project elements in alternative 2 would reduce stormwater generated on the park grounds and increase the amount of stormwater runoff that is handled on-site. While some additional impervious surface area would be added to Luther Ely Smith Square, new pervious surfaces would be added to the Park Over the Highway structure over I-70. Surface runoff would be reduced through grading that would improve drainage in areas such as the reflecting ponds, the East Slopes and across the West Gateway; the installation of swales around the ponds would catch, detain, and filter stormwater runoff; and soil amendments would be made in various locations of the park to improve vegetation growth and increase infiltration properties. The park's green spaces and swales around the ponds would help to promote infiltration to improve groundwater recharge, increase the amount of stormwater utilized by vegetation, capture stormwater runoff before it leaves the site, reduce the velocity and quantity of stormwater during intense storm events, and treat the stormwater runoff to remove pollutants before it leaves the park and enters adjacent water bodies, thereby improving water quality. Stormwater flows that could not be handled on the park grounds would be directed to the existing stormwater conveyance system.

Stormwater along the Central Riverfront would continue to flow untreated into the Mississippi River, either as sheet flows from Leonor K. Sullivan Boulevard across the levee and into the Mississippi River or via inlets and drains that feed into a portion of the storm sewer system that outflows directly into the Mississippi River. Sheet flows move rapidly across the land surface and arrive at the adjacent water source in short, concentrated bursts rather than infiltrating slowly into the ground surface. During storm events, pollutants and sediment from the Central Riverfront and surrounding urban development would continue to contaminate

stormwater runoff from the project area, negatively affecting water quality.

Construction-related impacts under alternative 2 would result in short-term minor adverse impacts to water quality as disturbed soils and altered stormwater flows could create an increased potential for soil erosion and transport of surface pollutants into adjacent water bodies and storm sewers. An increase in water use for irrigation in the park and the continued stormwater runoff that contains pollutants entering the Mississippi River during storm events would result in long-term minor adverse impacts to water resources and water quality. However, new methods used to reduce and treat stormwater runoff before it enters adjacent water bodies and a reduction in the use of pesticides would have long-term beneficial impacts on water quality.

#### Cumulative Impacts for Alternative 2

Past, present, and reasonably foreseeable future projects within the area of the Jefferson National Expansion Memorial that have potential impacts on water resources include the same projects discussed under alternative 1, the no-action alternative. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 2, such as the Visitor Center/ Museum roof replacement and repair of the North and South Overlook stairs. As such, construction activities could be coordinated and phased and could lessen the short-term impacts to water quality from the potential erosion of disturbed soils and/or altered stormwater flows during construction; however soil disturbance during construction under alternative 2 would be greater than under alternative 1.

Alternative 2, as noted above, would result in minor short- and long-term adverse impacts to water resources. Beneficial impacts would also occur. Combined with other past, present, and reasonably foreseeable future actions, there would be minor short- and long-term adverse cumulative impacts as well as long-term beneficial cumulative impacts. Actions directly related to alternative 2 would have limited contributions to impacts on water resources.

### Alternative 3: Maximum Change

Construction activities including excavation and grading of parts of the park grounds and for the expanded Visitor Center/Museum and new Visitor Center/Museum entrance, demolition of the Arch Parking Garage, and the replacement of some existing vegetation would temporarily disturb soils and alter existing stormwater flows. This would create an increased potential for soil erosion and/or transport of surface pollutants via stormwater runoff into adjacent water bodies and storm sewers. Best management practices, as described in the Alternatives chapter Mitigation Measures section, would be implemented during construction to minimize soil erosion, slow the rate at which water leaves the site, and capture eroded soils and concentrated nutrients before entering the Mississippi River and adjacent storm sewers. These best management practices would include an erosion and sediment control plan that would be developed prior to construction. Construction projects would be coordinated to minimize soil disturbance.

In alternative 3, there would be an increase in vegetation on the site, both in area and amount, which would increase water usage for irrigation. Plantings and landscape treatments, such as conservation mown areas and drought-tolerant plant species, would be installed on the park grounds and could help to reduce the need for irrigation which would reduce surface runoff and the use of potable water for irrigation purposes. Any irrigation systems that would require replacement under alternative 3 would utilize current technology to reduce potable water usage. A landscape maintenance regime could include organic treatments, which would reduce the need for the use of pesticides and fertilizers. This would help to improve the water quality in the reflecting ponds and could reduce algal blooms in the ponds, which are used to hold stormwater runoff from the park grounds.

Various project elements in alternative 3 would reduce stormwater generated on the park grounds and increase the amount of stormwater runoff that is handled on-site. While a limited amount impervious surface area would be added to the park grounds

at the plaza area in front of the new West Entrance to the Visitor Center/Museum, a large amount of new pervious surfaces would be added to the park after demolition of the Arch Parking Garage is complete and the new landscape installed. Some new pervious surfaces would also be added on the Park Over the Highway structure over I-70. Surface runoff would be reduced through grading that would improve drainage in areas such as the reflecting ponds, the East Slopes and across the West Gateway; the installation of swales around the ponds and shallow depressions in the Explorers Garden would catch, detain, and filter stormwater runoff; and soil amendments would be made in various locations of the park to improve vegetation growth and increase infiltration properties.

The increased green space and vegetation and swales around the ponds and Explorers Garden would help to promote infiltration to improve groundwater recharge, increase the amount of stormwater utilized by vegetation, capture stormwater runoff before it leaves the site, reduce the velocity and quantity of stormwater during intense storm events, and treat the stormwater runoff to remove pollutants before it leaves the park and enters adjacent water bodies, thereby improving water quality. Stormwater flows that could not be handled on the park grounds would be directed to the existing stormwater conveyance system.

Construction-related impacts under alternative 3 would result in short-term moderate adverse impacts to water quality as disturbed soils and altered stormwater flows from multiple construction projects could create an increased potential for soil erosion and transport of surface pollutants into adjacent water bodies and storm sewers. An increase in water use for irrigation in the park and the continued stormwater runoff that contains pollutants entering the Mississippi River during storm events would result in long-term minor adverse impacts to water resources and water quality. However, new methods used to reduce and treat stormwater runoff before it enters adjacent water bodies, increased vegetation, and a reduction in the use of pesticides would have long-term beneficial impacts on water quality.

### Cumulative Impacts for Alternative 3

Past, present, and reasonably foreseeable future projects within the area of the Jefferson National Expansion Memorial that have potential impacts on water resources include the same projects discussed under alternative 1, the no-action alternative. Some cumulative projects are expected to be incorporated into the design and construction process under alternative 3, such as the Visitor Center/ Museum roof replacement and repair of the North and South Overlook stairs. As such, construction activities could be coordinated and phased and could lessen the short-term impacts of the projects; however soil disturbance during construction under alternative 3 would be greater than the disturbance under alternatives 1 and 2.

Alternative 3, as noted above, would result in moderate short-term adverse impacts and minor long-term adverse impacts to water resources. Beneficial impacts would also occur. Combined with other past, present, and reasonably foreseeable future actions, there would be moderate short-term adverse cumulative impacts and minor long-term adverse cumulative impacts. Long-term beneficial cumulative impacts would also occur. Actions directly related to alternative 3 would have limited contributions to impacts on water resources.

## VISITOR USE AND EXPERIENCE

### METHODOLOGY FOR ASSESSING IMPACTS

The purpose of this impact analysis is to assess the effects of the alternatives on the visitor experience goals of the Jefferson National Expansion Memorial and visitor experience in the park, as well as access to the surrounding area and adjacent destinations in downtown St. Louis. To determine impacts, the current uses of the area were considered and the potential effects of the construction and implementation of the revitalization of the park on visitor opportunities and use were analyzed. Available activities and the types of visitor uses that exist in the park and which might be affected by the proposed actions, including recreation and interpretive experiences, pedestrian and bike access to the park, convenient vehicular parking, and universal access were evaluated. These evaluations included consideration of the park's purpose, significance, fundamental resources and values, and what contributes or detracts from desirable visitor opportunities. The visual character of the area and noises experienced by the visitors were also considered.

### STUDY AREA

The study area for visitor opportunities and use includes the area encompassed by the park's boundaries, the Central Riverfront adjacent to the levee and the Mississippi River between Biddle Street and Chouteau Avenue, and the area of downtown St. Louis area adjacent to the park within a comfortable walking distance (between one-quarter to one-half mile, which is a five- to ten-minute walk).

### IMPACT THRESHOLDS

The impact intensities for the assessment of impacts on visitor opportunities and use follow.

**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 and detectable but would not appreciably limit critical characteristics of the visitor experience. Visitor satisfaction would remain stable.

**Moderate:** A few critical characteristics of the desired visitor experience would change and/or the number of participants engaging in a specified activity would be altered. Some visitors who desire their continued use and enjoyment of the activity/visitor experience might pursue their choices in other available local or regional areas. Visitor satisfaction would begin to decline.

**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. Visitors who desire their continued use and enjoyment of the activity/visitor experience would be required to pursue their choices in other available local or regional areas. Visitor satisfaction would markedly decline.

**Duration:** Short-term impacts would occur during construction. Long-term impacts would continue or occur after construction is complete.

### IMPACTS OF THE ALTERNATIVES

Visitor Use and Experience covers impacts related to visitor opportunities and use, at the park and Central Riverfront, as well as bicycle and pedestrian circulation, parking and accessibility.

#### Alternative 1: No-Action Alternative

Under alternative 1, the no-action alternative, the National Park Service would landscape the surface of the Park Over the Highway structure over I-70 after completion of MoDOT's construction, as described in Cumulative Impacts. Construction activities such as grading and planting at the West Gateway and on the eastern side of Luther

Ely Smith Square would temporarily disrupt the existing visitor experience at the West Gateway as visitors would be directed away from construction activities, which could reduce access to Luther Ely Smith Square and the pedestrian crossings and Market and Chestnut Streets.

Access to and from downtown at the West Gateway area and other pedestrian connections to and within the park would be improved due to the landscaping of the Park Over the Highway. Visitors would continue to have access to the exhibits and programming currently offered, including at the Old Courthouse, the Visitor Center and Museum of Westward Expansion, the Ride to the Top of the Arch, and on the park grounds. Visitor fees would continue to be collected for the Ride to the Top of the Arch and the films screened in the Visitor Center/Museum. While the connections between the park and downtown would be improved, new destinations and activities would not be added to the park; the overall visitor use and experience at the park would not be considerably enhanced, and visitor attendance would be anticipated to follow past patterns.

The Central Riverfront would remain largely unchanged and visitor activity along the riverfront would continue to be periodically interrupted due to seasonal flooding along the Mississippi River which inundates Leonor K. Sullivan Boulevard, resulting in roadway closures and reduced pedestrian and vehicular access along the Central Riverfront.

On-site visitor parking facilities would remain, including the Arch Parking Garage and limited parking at the Old Cathedral. The Arch Parking Garage is currently utilized by the majority of visitors to the park, which provides convenient access for those arriving by vehicle. Vehicular access to the riverfront from downtown St. Louis would change at Washington Avenue due to the slip ramp. Visitor access to the Central Riverfront and the Arch Parking Garage would require a different route through Laclede's Landing to Washington Avenue. A shortage of oversized vehicle (RV) parking and short-term parking or loading and unloading passengers near the

park grounds would persist and could create inconveniences for visitors seeking those types of parking.

In the no-action alternative, a lack of barrier-free access points within the park grounds would continue, and would limit the ability of visitors with mobility disabilities to access some areas of the park including into the Visitor Center/Museum under the Arch, the Overlook stairs and Grand Staircase, and the Central Riverfront.

Construction of the Park Over the Highway landscape under the no-action alternative would result in short-term negligible to minor adverse impacts to visitor access to the West Gateway which would be limited during construction. Long-term negligible to minor adverse impacts to visitor use and experience would occur as new destinations, activities, and improvements would not be added to the park and flooding events would continue to limit access to the Central Riverfront. Landscaping of the Park Over the Highway would have long-term beneficial impacts to visitor use and experience due to the improved landscaped pedestrian connection between downtown and the park.

### **Cumulative Impacts for Alternative 1**

Past, present, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial and Central Riverfront that have potential impacts on visitor use and experience include:

1. Citygarden
2. Old Post Office Plaza
3. Eads Bridge Restoration
4. Old Courthouse Renovations and Repairs
5. Mississippi River Bridge
6. The Mercantile Exchange
7. Visitor Center/Museum roof replacement

8. Repair North and South Overlook stairs
9. Kiener Plaza and streetscape improvements
10. Construction of the Park Over the Highway structure
11. Poplar Street Bridge improvements

Public space development projects in downtown St. Louis including Citygarden and the Old Post Office Plaza improve conditions surrounding the park in downtown St. Louis by providing additional destinations and attractions for visitors and residents. The Eads Bridge restoration and structural rehabilitation and the Mississippi River Bridge construction are ongoing projects, which will provide improved access in downtown St. Louis for visitors and residents alike. The Old Courthouse renovations and repairs are ongoing, and are expected to improve the condition of the historic building, creating a more attractive destination for visitors.

The replacement of the roof on the underground Visitor Center/Museum is anticipated to occur whether or not the action alternatives occur, as it is needed to address leaks. The repair of the North and South Overlook stairs is a deferred maintenance project that would occur in the future to eliminate hazards and repair degraded materials. These projects would contribute to an improved visitor experience at the park by maintaining and improving facilities used by visitors.

The construction of the Park Over the Highway structure would change vehicular access to the riverfront from downtown St. Louis at Washington Avenue due to the slip ramp. Visitor access to the Central Riverfront and the Arch Parking Garage would require a different route through Laclede's Landing to Washington Avenue. Bicycle access to streets designated as part of the regional bikeway network via shared lanes with vehicular traffic, Memorial Drive and Washington Avenue, and a designated bike route, Chestnut Street, would be modified by the Park Over the Highway structure. Bicyclists would be

routed with vehicular traffic around the permanent northbound closure of Memorial Drive, moving from south to north in a clockwise direction around Luther Ely Smith Square. Bicyclists would be routed around the southbound closure of Memorial Drive onto the Pine Street pedestrian bridge. The Poplar Street Bridge improvements would also modify the access to the Poplar Street Bridge from downtown St. Louis. These ongoing and future projects could limit visitor access to areas of the park and downtown during construction, causing short-term adverse impacts to visitor use and experience.

The no-action alternative, as noted above, would result in negligible to minor short- and long-term adverse impacts to visitor use and experience. There would also be beneficial impacts. Combined with other past, present, and reasonably foreseeable future actions, there would be short-term minor adverse cumulative impacts and long-term beneficial cumulative impacts to visitor use and experience.

### **Alternative 2: Moderate Change**

During construction of project elements at the park and along the Central Riverfront, visitor access would be limited and changed to accommodate construction locally at project sites. These projects include the grading and landscaping of the Park Over the Highway, installation of the plaza at Luther Ely Smith Square, renovations to the Visitor Center/Museum and the Old Courthouse, the installation of universally accessible paths around the ponds, along the East Slopes down to the riverfront, and into the Visitor Center/Museum under the Arch, the replacement in-kind of the Processional walks, the installation of stormwater management and new vegetation, streetscape improvements at the Old Courthouse, and construction of the project elements along the Central Riverfront. During construction, signage and other accommodations to allow for maximum visitor access to the park would be implemented. Construction would be coordinated and phased to limit disruptions to visitors wherever possible.

Under alternative 2, additional activities and destinations would be added to the park for local and non-local visitors. The exhibit space in the Visitor Center/Museum would be renovated and updated as would the galleries and exhibits on the first and second floors of the Old Courthouse, improving the interpretive opportunities available to visitors. Visitor fees would continue to be collected for the Ride to the Top of the Arch and the films screened in the Visitor Center/Museum. Areas for passive recreation, gathering spaces, seating during large events, and places to view the trains and the riverfront would be added. Providing these additional activities for visitors would enhance the visitor experience and could increase overall visitor satisfaction. Visitation would be expected to increase due to the updated exhibits and additional activities.

Accessibility improvements would increase visitor comfort and satisfaction by creating additional access to destinations in the park for all visitors, including to the first and second floors of the Old Courthouse and accessible entrance and egress ramps to the Visitor Center/Museum. Paths across the Park Over the Highway landscape would provide an accessible route to the park from downtown at the West Gateway, which would act as a bridge between the Old Courthouse, downtown St. Louis, and the park. The addition of two to four accessible paths on the East Slopes would provide more pedestrian access to the Central Riverfront and riverfront businesses. New pedestrian and bicycle circulation elements would be added to the park grounds, including paths at the ponds, rehabilitation of the Processional Walks, and the addition of a bus drop-off at Luther Ely Smith Square. These pedestrian and accessibility improvements would increase the ways to get to and between the park, the city, and the riverfront, and to destinations within the park. These improvements may attract additional visitors to the site and could encourage return visits. They would also enhance access to the park for downtown workers and residents, creating easier, more approachable and more enjoyable access to the park and the riverfront, expanding visitation to the park by downtown visitors, workers, and residents.

Along the Central Riverfront, improved protection from river flooding due to the raised elevation of Leonor K. Sullivan Boulevard would limit roadway closures and provide more predictable access to riverfront businesses and activities. The bicycle and pedestrian promenade along Leonor K. Sullivan Boulevard would improve the safety, variety, and quality of recreational opportunities along the Central Riverfront. Improving the variety and quality of recreational activities would also improve the visitor experience.

The Arch Parking Garage would remain, with aesthetic improvements, and vehicular access would be provided via a slip lane onto Washington Avenue from the I-70 ramp and from Laclede's Landing. The Arch Parking Garage is currently utilized by the majority of visitors to the park, which provides convenient access for those arriving by vehicle. Vehicular access to the riverfront from downtown St. Louis would change at Washington Avenue due to the slip ramp. Visitor access to the Central Riverfront and the Arch Parking Garage would require a different route through Laclede's Landing to Washington Avenue. In this alternative, a shortage of oversized vehicle and short-term parking for loading and unloading near the park would persist.

Actions under alternative 2 would improve resource conditions, visitor facilities, and infrastructure throughout the park and connect it with the city and the river, positively affecting local users and non-local visitors. Alternative 2 would provide new and upgraded opportunities, destinations, activities, services, and amenities for visitors that could make them stay longer. Improved connections and visitor amenities would create safer and more comfortable conditions for all visitors. These actions could contribute to increased overall visitation levels from first-time visitors and return visitors and could encourage visitors to extend their stay while at the park.

Construction-related impacts under alternative 2 would result in short-term moderate adverse impacts to visitor access to activities and destinations within areas of

the park that could be limited or changed to accommodate construction. In the long term, there would be beneficial impacts to visitor experience and satisfaction due to the increase in destinations, activities, and accessibility within the park and along the Central Riverfront and the improved landscaped pedestrian connection between downtown and the park. Minor adverse impacts to visitor use and experience would also occur due to a continued shortage of oversize and short-term vehicle parking.

### **Cumulative Impacts for Alternative 2**

Past, present, and reasonably foreseeable projects within the area of the park that have potential impacts on visitor experience include the same projects discussed under alternative 1, the no-action alternative. Some cumulative projects would be incorporated into the design and construction process under alternative 2, such as the Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs.

Alternative 2, as noted above, would result in moderate short-term adverse impacts to visitor use and experience. There would also long-term minor adverse impacts and long-term beneficial impacts. Combined with other past, present, and reasonably foreseeable future actions, there would be short-term moderate adverse cumulative impacts during construction and long-term beneficial cumulative impacts.

### **Alternative 3: Maximum Change**

During construction of project elements at the park and along the Central Riverfront, visitor access would be limited and changed to accommodate construction locally at project sites. In addition to the construction activities and locations described under alternative 2, other construction activities would occur under alternative 3 including construction of the new Visitor Center/Museum entry at the West Gateway and expanded the Visitor Center/Museum structure under the Arch. Alternative 3 would also demolish the Arch Parking Garage and install new landscape features in the North Gateway including the

Explorers Garden and new pedestrian paths and bikeways. As in alternative 2, signage and other accommodations to allow for maximum visitor access to the park during construction would be implemented. Construction would be coordinated and phased to limit disruptions to visitors wherever possible.

An increase in activities and destinations would be anticipated at the park in this alternative. The new Visitor Center/Museum entry at the West Gateway in alternative 3 would include a plaza area in front of the entrance, visitor amenities such as ticket stations, and security in the new lobby. The Visitor Center/Museum addition would include visitor orientation, museum exhibit, and education space, while existing exhibit space in the Visitor Center/Museum would be renovated. The galleries and exhibits on the first and second floors of the Old Courthouse would be renovated and updated. These changes would increase and improve the interpretive opportunities available to visitors.

The ticket stations in the new lobby would create a central entry point that would facilitate the collection of an entrance fee for the Visitor Center/Museum, as well as any other fees for visitor experiences such as the Ride to the Top of the Arch. A fee structure would be determined during the detailed design process. Free access to the Arch grounds and the Old Courthouse would continue. The creation of an entrance fee would create a more inclusive way of collecting visitor fees that support the visitor experience at the park. The centralized ticketing could make the experience of entering the Visitor Center/Museum and obtaining tickets to desired experiences easier than the existing configuration which requires visitors to wait in line to enter the Visitor Center/Museum and then again for tickets to Ride to the Top of the Arch and for film screenings.

The West Gateway and Visitor Center/Museum entry would serve as a major point of arrival for visitors and would act as a bridge between the Old Courthouse, downtown St. Louis, and the park. Visitors would no longer enter the Visitor Center/Museum at

the Arch legs. Entry at the Arch legs is part of the design of the park's integrated purposeful approach and the loss of this historic designed entry experience would negatively affect the visitor experience. The NPS would install accessible egress routes from the Visitor Center/Museum at the Arch legs, which would help mitigate these effects.

Park-wide activities and destinations would be added for local and non-local visitors, providing additional services and activities, which could increase overall satisfaction. These include areas for passive recreation, pedestrian and bicycle paths, seating during large events, gathering spaces, and places to view the trains and the riverfront. Providing these additional activities for visitors would enhance the visitor experience and could increase overall visitor satisfaction. Visitation would be expected to increase due to the updated exhibits and additional activities.

New pedestrian and bicycle circulation elements would be added to the park grounds, including paths and bikeways at the ponds, circulation to the Central Riverfront from the park via accessible paths, and a bicycle path at the north end of the park grounds; as well as improved access to the MetroLink station in Eads Bridge (due to the removal of the Arch Parking Garage), rehabilitation of the Processional Walks, and the addition of a bus drop-off at Luther Ely Smith Square. The dedicated bicycle path along Washington Avenue would enhance its use as part of the regional bikeway network. Collectively, these changes would enhance the ability of visitors to access the park through a variety of transportation modes and new entry points. These improvements may attract additional visitors to the site and could encourage return visits.

Accessibility improvements would increase visitor comfort and satisfaction by creating additional access to destinations in the park for all visitors, including to the first and second floors of the Old Courthouse. The new West Entrance to the Visitor Center/Museum would be accessible. Accessibility would be improved to both the first and second floors of the Old Courthouse.

Accessible paths would be added at the ponds and the addition of two to four accessible paths on the East Slopes would provide more pedestrian access to the Central Riverfront and riverfront businesses. These pedestrian and accessibility improvements would increase the ways to get to and between the park, the city, and the riverfront, and to destinations within the park, improving visitor access and circulation. Local users would also enjoy easier, more approachable access to the park and the riverfront.

The Arch Parking Garage would be demolished after the implementation of an alternative parking strategy. Open space and a lawn that could be used for event space, a children's garden, a drop-off area, and accessible pedestrian and bicycle paths would be installed in the North Gateway, creating more visitor amenities and a more pleasant visitor experience at the north end of the park. The removal of the garage would adversely impact the access and experience of those visitors seeking on-site parking close to the Arch. Washington Avenue would be closed to through traffic and a shared pedestrian/bicycle path would be installed. This path could encourage visitation to the riverfront businesses by pedestrian and bicyclists; however, it would also change vehicular access and parking for those visitors who use this area to access riverfront businesses. The shortage of oversized vehicle parking near the park would persist. However, the new loading/unloading areas around Luther Ely Smith Square would improve short-term drop-off/loading areas for oversize vehicles, such as buses.

Along the Central Riverfront, improved protection from river flooding due to the raised elevation of Leonor K. Sullivan Boulevard would limit roadway closures and provide more predictable access to the riverfront. The bicycle and pedestrian promenade along Leonor K. Sullivan Boulevard would improve the safety, variety, and quality of recreational opportunities along the Central Riverfront. Improving the variety and quality of recreational activities could also lead to increased visitation and enhanced experience.

Construction-related impacts under alternative 3 would result in short-term moderate adverse impacts to visitor access to activities and destinations within areas of the park that could be limited or changed to accommodate construction. Long-term minor adverse impacts to visitor use and experience would occur due to the change in the designed visitor's entry approach to the Visitor Center/Museum and a continued shortage of oversize and short-term vehicle parking. In the long term, there would be beneficial impacts to visitor experience and satisfaction due to the increase in opportunities, destinations, activities, and accessibility within the park and along the Central Riverfront and the new West Entry that would provide a direct pedestrian connection between downtown and the park.

### **Cumulative Impacts for Alternative 3**

Past, present, and reasonably foreseeable projects within the area of the park that have potential impacts on visitor use and experience include the same projects discussed earlier in this section under alternative 1, the no-action alternative. Some cumulative projects would be incorporated into the design and construction process under alternative 3, such as the Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs.

Alternative 3, as noted above, would result in moderate short-term adverse impacts. There are also long-term minor adverse impacts and long-term beneficial impacts to visitor use and experience. Combined with other past, present, and reasonably foreseeable future actions, there would be short-term moderate adverse cumulative impacts and long-term beneficial cumulative impacts.

## **SOCIOECONOMICS**

### **METHODOLOGY FOR ASSESSING IMPACTS**

This section analyzes the impacts of the alternatives on the socioeconomic environment surrounding the park in downtown St. Louis, including the Central Riverfront. While the description of the socioeconomic impacts focuses on downtown St. Louis, regional impacts are also addressed. To determine impacts, current socioeconomic conditions were considered and the potential effects of the construction and implementation of the revitalization of the park on socioeconomics were analyzed. The economic contribution of the park and riverfront businesses, and visitor spending in the local economy, as well as population, employment, and income were evaluated.

### **STUDY AREA**

The study area for socioeconomics includes the area encompassed by the park's boundaries and the Central Riverfront, and the area of downtown St. Louis adjacent to the park that is within a comfortable walking distance (between one-quarter to one-half mile, which is a five- to ten-minute walk). Regional impacts within the City of St. Louis are also considered.

### **IMPACT THRESHOLDS**

The impact intensities for the assessment of impacts on socioeconomics follow.

**Negligible:** No effects would occur, or the effects on businesses or other socioeconomic conditions would be below or at the level of detection.

**Minor:** The effects on businesses or other socioeconomic conditions would be small but detectable and would only affect a limited number of businesses, organizations, or individuals.

**Moderate:** The effects on local businesses or other socioeconomic conditions would be readily apparent. Changes in economic

or social conditions would affect many businesses, organizations, or individuals.

**Major:** The effects on businesses or other socioeconomic conditions would be readily apparent. Changes in social or economic conditions would be substantial and affect the majority of businesses, organizations, or individuals.

**Duration:** Short-term impacts would occur during construction. Long-term impacts would continue or occur after construction is complete.

## IMPACTS OF THE ALTERNATIVES

Economic analyses for proposed projects are ongoing, including a museum analysis and a business plan. As such, the analysis of potential economic impacts of park actions provided in this EA is largely qualitative. The proposed action cannot be quantified without the further data being generated in these ongoing studies. Once available, these studies would be considered in the design and planning process.

### Alternative 1: No-Action Alternative

Under alternative 1, the National Park Service would landscape the surface of the Park Over the Highway structure over I-70 after completion of MoDOT's construction of the structure, as described in Cumulative Impacts. Construction-related spending for activities such as grading and planting at the West Gateway and on the eastern side of Luther Ely Smith Square could generate revenue for individual businesses in the region. Potential disruptions caused by construction such as grading and excavating and other construction actions could close or limit areas of the park, could make them less desirable to visit, which could reduce visitor spending in the local area during construction.

In alternative 1, visitors would continue to have access to the exhibits and programming currently offered, including at the Old Courthouse, the Visitor Center/Museum, the Ride to the Top of the Arch, and on the park grounds. The connection between the West Gateway and downtown would be improved;

however, other connections between the park, downtown, and the riverfront would not be improved and new destinations and activities would not be added to the park. Therefore, the overall livability and social benefits the park provides to downtown would not be enhanced.

The Arch Parking Garage would remain in place and its use continued. Vehicular access to the parking garage from Washington Avenue would remain open; however, access to Washington Avenue from Memorial Drive could be modified by MoDOT's proposed changes to the highway and street infrastructure along the I-70 corridor. The Arch Parking Garage bonds are scheduled to be paid in full in 2012. Once these bonds are paid, the revenue stream to NPS and NPS park partner, Metro, is anticipated to increase for the structural and useful lifetime of the parking garage. However, long term, maintenance needs on the garage would increase, as the structure reaches the end of its usable life. Any increase in revenues from the Arch Parking Garage would likely generate additional spending in the local economy. Revenue from visitor fees would continue to be collected at the existing ticket counter locations for the Ride to the Top of the Arch and the films screened in the Visitor Center/Museum.

The Central Riverfront would remain largely unchanged and business activity along the riverfront would continue. Access would continue to be periodically interrupted due to seasonal flooding along the Mississippi River that would inundate Leonor K. Sullivan Boulevard, resulting in roadway closures and reduced pedestrian and vehicular access to businesses and activities along the Central Riverfront.

The economic contribution to industries such as hotels and restaurants in downtown St. Louis would persist and the park would continue to have a long-term local beneficial economic impact on the region; however, local and non-local visitor spending is less than 3% of all tourist-related spending that occurs in the in the St. Louis Area (CVC 2011 and NPS 2011b). The no-action alternative would continue the activities at the park that

generate spending in the local area and in the region, including operational expenditures made by the National Park Service, and visitor spending. The NPS would continue current management practices under the no-action alternative. Standard maintenance activities would continue and would expand to include the maintenance of the landscape along the Park Over the Highway. Deferred maintenance projects, as described in the Cumulative Impacts section, would be undertaken as funding permits. No major new initiatives would be undertaken. Operational expenditures such as payroll, supplies, and materials to maintain the park would continue and visitorship levels would likely follow existing visitorship trends.

Construction-related spending impacts from implementation of the Park Over the Highway landscape under the no-action alternative would have a short-term beneficial economic impact on the local economy as spending could generate revenue for individual businesses in the region. Long-term economic impacts in downtown St. Louis and the region would be negligible as no other broad changes in management, visitation, or operations would occur and visitorship levels and visitor spending in the local area would likely follow existing trends. There would be continued minor short- and long-term adverse impacts to socioeconomic resources as the livability benefits provided by the overall park would not be enhanced and periodic flooding along the Central Riverfront would continue. The park and the Central Riverfront would continue to have a short- and long-term local beneficial economic impact on the region driven by visitor spending and operational expenditures.

### Cumulative Impacts for Alternative 1

Past, present, and reasonably foreseeable projects within the area of the Jefferson National Expansion Memorial that have potential impacts on socioeconomic resources include:

- Citygarden
- Cupples Station Ballpark Lofts

- Hyatt Regency St. Louis Riverfront
- Federal Reserve Bank of St. Louis
- Old Post Office Plaza
- Eads Bridge Restoration
- Old Courthouse Renovations and Repairs
- Mississippi River Bridge
- The Mercantile Exchange
- Visitor Center/Museum roof replacement
- Repair north and south overlook stairs
- Kiener Plaza and streetscape improvements
- Construction of the Park Over the Highway structure
- Emerald Ash Borer Environmental Assessment
- Poplar Street Bridge improvements

Development projects in downtown St. Louis including Citygarden, Cupples Station Ballpark Lofts, the renovation of the Hyatt Regency St. Louis Riverfront, the Federal Reserve Bank of St. Louis and the Old Post Office Plaza have all contributed investments and infrastructure improvements in downtown St. Louis. The Old Courthouse renovations and repairs, the Eads Bridge restoration and structural rehabilitation, the Mississippi River Bridge, and the Mercantile Exchange complex are ongoing, creating business opportunities for the construction industry and providing investments and infrastructure improvements in downtown St. Louis.

The replacement of the roof on the underground Visitor Center/Museum and the repair of the North and South Overlook stairs are deferred maintenance projects that would occur as funding permits. The replacement of the Rosehill ash trees would be completed in phases and according to the approved EAB

EA after detection of the emerald ash borer. Replacement and deferred maintenance expenditures would likely occur over time and would positively influence individual businesses; however, regional earnings would be minor. The Poplar Street Bridge improvements would also create investment and new infrastructure downtown, as well as some local earnings during construction.

Cumulative impacts from other projects and planning activities including Citygarden, Cupples Station Ballpark Lofts, the Old Post Office Plaza, the Mercantile Exchange, and Kiener Plaza and streetscape improvements have the potential to increase visitation to the park and downtown, creating benefits for downtown retailers and businesses. These projects and activities would also increase the amount and quality of infrastructure, facilities, and activities for downtown residents, workers, and visitors.

The no-action alternative, as noted above, would result in negligible to minor short- and long-term adverse impacts to socioeconomic resources. There would also be beneficial impacts. Combined with other past, present, and reasonably foreseeable future actions, there would be short- and long-term negligible to minor adverse cumulative impacts and short- and long-term beneficial cumulative impacts to socioeconomic resources; however this alternative would contribute minimally to those impacts.

#### **Alternative 2: Moderate Change**

Under alternative 2, construction-related spending would occur to implement CityArchRiver 2015 Initiative projects at the park and along the Central Riverfront. Net construction cost estimates for alternative 2 range between approximately \$75 million and \$100 million; however, it is assumed that expenditures would occur over several years and are not guaranteed. Economic impacts to individual businesses could be substantial, but regional construction earnings would be minor. Potential disruptions caused by construction such as grading and excavating and other construction actions could close or limit areas of the park, could make them

less desirable to visit, and could reduce visitor spending in the local area during construction.

Under alternative 2, the galleries and exhibits on the first and second floors of the Old Courthouse would be renovated and updated, as would the existing exhibit space in the Visitor Center/Museum. Additional activities and destinations would be added for local and non-local visitors, such as pedestrian and bicycle paths, areas for passive recreation, seating during large events, gathering spaces, and places to view the trains and the riverfront. Visitation would be expected to increase due to the updated exhibits and additional activities, which could lead to increased spending.

Pedestrian connectivity and accessibility measures would be implemented around the park, including paths within the park and paths across the new West Gateway and the Park Over the Highway. The Park Over the Highway landscape at the West Gateway would create a link between the Old Courthouse, downtown St. Louis, and the park. Accessibility improvements would create additional access to the first and second floors of the Old Courthouse and accessible entrance and egress routes to the Visitor Center/Museum. The addition of two to four accessible paths on the East Slopes would provide more pedestrian access to the Central Riverfront and riverfront businesses. Increased connectivity between the city, the park, and the riverfront could increase patronage of local businesses by park visitors. These pedestrian and accessibility improvements would increase the ways to get to and between the park, the city, and the riverfront, and to destinations within the park. This would attract additional visitors to the site and could encourage return visits, both of which would increase contributions to the local economy. It would also enhance access to the park for local users, creating easier, more approachable and more enjoyable access to the park and the riverfront, increasing the vitality of the downtown area and enhancing the overall livability and social benefits the park provides to downtown visitors, workers, and residents.

The Arch Parking Garage would remain, with aesthetic improvements, and vehicular access would be provided via a slip lane onto Washington Avenue from the I-70 ramp and from Laclede's Landing. The Arch Parking Garage bonds are scheduled to be paid in full in 2012. Once these bonds are paid, the revenue stream to NPS and NPS' park partner, Metro, is anticipated to increase for the structural and useful lifetime of the parking garage. However, long term maintenance needs on the garage would increase, as the structure reaches the end of its usable life. Any increase in revenues from the Arch Parking Garage would likely generate additional spending in the local economy. Revenue from visitor fees would continue to be collected at the existing ticket counter locations for the Ride to the Top of the Arch and the films screened in the Visitor Center/Museum.

Along the Central Riverfront, improved protection from river flooding due to the raised elevation of Leonor K. Sullivan Boulevard would limit roadway closures and provide more predictable access to riverfront businesses, which would minimize revenue lost during such events. The bicycle and pedestrian promenade along Leonor K. Sullivan Boulevard would provide an outdoor amenity that could attract visitors and local users to the Central Riverfront. The promenade would provide local users with a place to exercise and recreate outdoors and it could contribute to the social vitality of the local area. It would also connect communities and provide access to The River Ring, a series of interconnected greenways, parks, and trails throughout the St. Louis region. The Central Riverfront would provide a key link in The River Ring by connecting the Mississippi Greenway to the Confluence Greenway. Improving the variety and quality of recreational activities and could also lead to increased visitation and extended stays, which would increase visitor spending and economic contributions to the local economy.

Increased operations and maintenance due to the new destinations and activities in the park would result in an increase in spending and local employment, generating local economic activity. The economic contribution

of park and Central Riverfront visitors to some industries such as hotels and restaurants in downtown St. Louis would continue and could increase.

Alternative 2 would provide new and upgraded opportunities, services, and amenities for visitors that could make them stay longer. Improved connections and visitor amenities would create safer and more comfortable conditions for all visitors. These actions could contribute to increased overall visitation levels from first-time visitors, encourage visitors to extend their stay, and possibly promote more repeat visitation. Resulting impacts from increased visitation on the local and regional economy would be beneficial; however, local and non-local visitor spending is less than 3% of all tourist-related spending that occurs in the in the St. Louis Area (CVC 2011 and NPS 2011b).

Construction-related spending impacts under 2 alternative would have a short-term beneficial economic impact on the local economy as spending would generate revenue for individual businesses in the region. Short-term minor adverse local impacts could also occur during construction if visitation declines while access to areas of the park is limited. Actions under alternative 2 would increase visitorship levels as well as visitor and operational spending by increasing and improving visitor facilities and infrastructure throughout the park and the Central Riverfront and connecting the park with the city and the river, which would have long-term beneficial economic impacts in downtown St. Louis and the region. The pedestrian and accessibility improvements would also have long-term beneficial impacts to socioeconomic resources by enhancing the overall livability and social benefits the park and the Central Riverfront provide.

### **Cumulative Impacts for Alternative 2**

Past, present, and reasonably foreseeable projects within the area of the park that have potential impacts on socioeconomic resources include the same projects discussed earlier in this section under alternative 1, the no-action alternative. Some cumulative projects would be incorporated into the

design and construction process under alternative 2, such as the Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs.

Alternative 2, as noted above, would result in minor short-term adverse impacts to socioeconomic resources. There would also be short- and long-term beneficial impacts. Combined with other past, present, and reasonably foreseeable future actions, short-term minor adverse cumulative impacts and short- and long-term beneficial cumulative impacts would occur. Actions directly related to alternative 2 would have limited contributions to impacts on socioeconomic resources.

### **Alternative 3: Maximum Change**

Under alternative 3, construction-related spending would occur to implement CityArchRiver 2015 Initiative projects at the park and along the Central Riverfront. Net construction cost estimates for alternative 3 range between approximately \$180 million and \$250 million; however, as with alternative 2, it is assumed that expenditures would occur over several years and are not guaranteed. The economic impacts to individual businesses and the region would be the same as those discussed under alternative 2.

In addition to the additional activities and destinations that would be added as described in alternative 2, a new West Entrance to the Visitor Center/Museum would be constructed at the West Gateway in alternative 3 and would include a plaza area in front of the entrance and visitor amenities and security in the new lobby. The entry and Visitor Center/Museum addition would include visitor orientation, museum exhibit, and education space and renovation of the existing exhibit space in the Museum of Westward Expansion. Visitation would be expected to increase due to expanded and updated exhibits, additional activities, and new event spaces. These improvements could encourage return visits, both of which would increase contributions to the local economy.

The pedestrian connectivity and accessibility measures described in alternative 2 would be implemented under alternative 3. Alternative 3

would also include the new accessible Visitor Center/Museum entrance in the West Gateway. The West Gateway and Visitor Center/Museum entry would serve as a major point of arrival for visitors and would create a link between the Old Courthouse, downtown St. Louis, and the park. These pedestrian and accessibility improvements would increase the ways to get to and between the park, the city, and the riverfront, and to destinations within the park which may attract additional visitors to the site and could encourage return visits. It would also enhance access to the park for local users, creating easier, more approachable and more enjoyable access to the park and the riverfront, increasing the vitality of the downtown area and enhancing the overall livability and social benefits the park provides to downtown visitors, workers, and residents.

The Arch Parking Garage would be removed after implementation of an alternative parking strategy under this alternative and a lawn that could be used for event space, a children's garden called the Explorers Garden, and accessible pedestrian and bicycle paths would be installed in the North Gateway. Washington Avenue would be closed to through traffic, a shared pedestrian/bicycle path would be installed, and a drop-off area would be established. This path could encourage visitation to the riverfront businesses by pedestrian and bicyclists; however, it would also change vehicular access to the riverfront. The removal of the Arch Parking Garage would provide views between the park and Laclede's Landing, which could encourage visitors to move between the two destinations and patronize venues such as restaurants in Laclede's Landing as well as visit the park.

Removal of the Arch Parking Garage would eliminate the revenue stream currently generated by the garage for NPS and NPS' park partner, Metro. An entrance fee for the Visitor Center/Museum, as well as any other fees for visitor experiences such as the Ride to the Top of the Arch, would be collected at ticket stations in the new lobby. The entrance fee could generate additional revenue, depending on the fee structure and visitation levels into the Visitor Center/Museum. A fee structure would be determined during the detailed design process. Free access to the Arch grounds and the Old Courthouse would continue.

Eliminating on-site parking could encourage visitors to park downtown and visit more attractions, which could extend visitor stays and lead to increased visitor spending. This could improve the utilization of parking facilities in downtown if existing facilities are used to meet visitor parking needs. A parking study conducted for Metro considers existing supplies and the construction of a new garage as potential options for parking solutions (Carl Walker 2012). The parking study would be used to identify parking strategies for park visitors in alternative 3 to continue easy access to parking for visitors.

Along the Central Riverfront, the actions proposed by alternative 3 are the same as those described in alternative 2. The improved protection from river flooding, increase in recreational outdoor space, and connections to the regional greenway, parks, and trails system would improve the variety and quality of recreational activities and could lead to increased visitation and extended stays and increase local economic contributions.

Increased operations and maintenance due to the new facilities, destinations, and activities in the park would result in an increase in spending and local employment, generating local economic activity. The economic contribution of park visitors to some industries such as hotels and restaurants in downtown St. Louis would continue and the park would continue and could increase.

This alternative would improve resource conditions, visitor facilities, and infrastructure throughout the park and connect it with the city and the river. It would provide new and upgraded opportunities, services, and amenities for visitors that could make them stay longer. Improved and increased connections and visitor amenities would create safer and more comfortable conditions for all visitors. These actions could contribute to increased overall visitation levels from first-time visitors, encourage visitors to extend their stay, and possibly promote more repeat visitation. Resulting impacts from increased visitation on the local and regional economy would be beneficial; however, local and non-local visitor spending is less than 3% of all tourist-related

spending that occurs in the in the St. Louis Area (CVC 2011 and NPS 2011b).

Construction-related spending impacts under 3 alternative would have a short-term beneficial economic impact on the local economy as spending would generate revenue for individual businesses in the region. Short-term local minor to moderate adverse impacts could also occur during construction if visitation declines while access to areas of the park is limited. Removal of the Arch Parking Garage would have long-term minor adverse impacts due to the loss of a revenue-generating facility. Actions under alternative 3 would increase visitorship levels as well as visitor and operational spending by increasing and improving visitor facilities and infrastructure throughout the park and the Central Riverfront and connecting the park with the city and the river, which would have long-term beneficial economic impacts in downtown St. Louis and the region. The pedestrian and accessibility improvements would also have long-term beneficial impacts to socioeconomic resources by enhancing the overall livability and social benefits the park and the Central Riverfront provide.

### **Cumulative Impacts for Alternative 3**

Past, present, and reasonably foreseeable projects within the area of the park that have potential impacts on socioeconomic resources include the same projects discussed under alternative 1, the no-action alternative. Some cumulative projects would be incorporated into the design and construction process under alternative 3, such as the Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs.

Alternative 3, as noted above, would result in minor to moderate short-term adverse impacts and long-term minor adverse impacts to socioeconomic resources. There would also be short- and long-term beneficial impacts. Combined with other past, present, and reasonably foreseeable future actions, there would be short-term minor to moderate adverse cumulative impacts, long-term minor adverse impacts, and short- and long-term beneficial cumulative impacts. Actions directly related to alternative 3 would have limited contributions to impacts on socioeconomic resources.

## **OPERATIONS AND MANAGEMENT**

### **METHODOLOGY FOR ASSESSING IMPACTS**

Operations and management, for the purpose of this analysis, refers to the ability of the NPS staff to protect and preserve park resources and facilities, and to provide for an effective visitor experience. It also addresses the effectiveness and efficiency with which the NPS staff are able to perform such tasks. This includes an analysis of energy conservation and sustainability measures. Within this analysis, it is assumed that the expansion of existing facilities or the construction of new facilities would require necessary increases in staff, for which funding is not guaranteed. This analysis also accounts for impacts on the operations and management of entities with responsibilities associated with the Central Riverfront improvements. Staff who are knowledgeable of these issues were members of the planning team that evaluated the impacts of each alternative. The impact analysis is based on the current description of operations and management presented in “Chapter 3: Affected Environment” of this document.

### **STUDY AREA**

The study area for operations and management is the area encompassed by the park’s boundaries, and the area along the Central Riverfront adjacent to the levee and the Mississippi River, between Biddle Street and Chouteau Avenue.

### **IMPACT THRESHOLDS**

The impact intensities for the assessment of impacts on operations and management follow.

**Negligible:** Operations would not be impacted or the project would not have a noticeable or appreciable impact on operations.

**Minor:** Impacts would be noticeable, but would be of a magnitude that would not result in an appreciable or measurable change to operations.

**Moderate:** Impacts would be readily apparent and would result in a substantial change in operations that would be noticeable to staff and the public. Mitigation could be required and may be effective.

**Major:** Impacts would be readily apparent and would result in a substantial change in operations that would be noticeable to staff and the public and would require organizations to readdress their ability to sustain current operations.

**Duration:** Short-term impacts would occur during construction. Long-term impacts would continue or occur after construction is complete.

### **IMPACTS OF THE ALTERNATIVES**

Park operations and management covers impacts related to the operations of the park, as well as along the Central Riverfront, and impacts to energy requirements and conservation/sustainability

#### **Alternative 1: No-Action Alternative**

Under alternative 1, the National Park Service would landscape the surface of the Park Over the Highway structure over I-70 after completion of MoDOT’s construction of the structure, as described in Cumulative Impacts. Construction activities such as grading and planting at the West Gateway and on the eastern side of Luther Ely Smith Square would temporarily alter maintenance operations in the vicinity of the construction. Activities such as mowing, turf maintenance, and irrigation would be accomplished around any active construction or staging areas.

Current management practices would continue within the park and along the Central Riverfront. Standard maintenance activities would continue and would increase in time and costs to maintain the landscape along the Park Over the Highway, utilizing existing park resources. Deferred maintenance projects, as described in the Cumulative Impacts section, would be undertaken as funding permits. Operation of the park could decline if staffing and maintenance levels are not increased to meet

existing and future needs. The continued existence of the Arch Parking Garage in this alternative would allow for its revenue stream to be maintained. However, long term, maintenance needs on the garage would increase, as the structure reaches the end of its usable life. Revenue from visitor fees would continue to be collected at the existing ticket counter locations for the Ride to the Top of the Arch and the films screened in the Visitor Center/Museum without a change to operations.

At the Central Riverfront, seasonal flooding would continue to cause periodic closures of the roadway that would continue to burden park operations by limiting access for park staff to complete maintenance responsibilities. The demands of post-flood clean-up of the Central Riverfront on Leonor K. Sullivan Boulevard and the levee would continue to be handled by City of St. Louis staff. Flooding events would continue to require placement of temporary traffic control devices for roadway closures. Post-flood cleanup operations by City of St. Louis personnel would be required prior to re-opening the Central Riverfront to the public.

In addition, existing facilities would not benefit from an increase in energy efficiency beyond any existing repairs and renovations described under cumulative impacts. Landscape maintenance practices would continue and stormwater management practices would remain unchanged at the park. Untreated stormwater run-off would continue to include fertilization from the existing grass turf at the park. Energy use related to facilities and landscape maintenance would remain at existing levels as would water usage for irrigation. Therefore, this alternative would not promote NPS energy conservation goals and sustainability measures.

Operations impacts related to construction under the no-action alternative would include short-term minor adverse impacts as maintenance operations access to the Park Over the Highway construction areas would be limited. Flooding events would cause

long-term minor to moderate adverse impacts on operations by limiting park maintenance access and require clean-up action by City of St. Louis staff. The lack of energy conservation and sustainable management practices would also contribute to the long-term adverse impacts.

### **Cumulative Impacts for Alternative 1**

Past, present, and reasonably foreseeable future projects within the area of the Jefferson National Expansion Memorial that have potential impacts on operations and management include:

- Old Courthouse renovations and repairs
- Visitor Center/Museum roof replacement
- Repair North and South Overlook stairs
- Construction of the Park Over the Highway structure

Construction and deferred maintenance projects on the park grounds including the Old Courthouse renovations and repairs, the replacement of the roof on the underground Visitor Center/Museum to address leaks, and the repair of the North and South Overlook stairs to eliminate hazards and repair degraded materials would have short-term minor adverse impacts on operations and management within the park during construction, due to changes in maintenance routines and inconvenience. These changes would have beneficial long-term impacts to operations and management upon completion, due to decreased maintenance upkeep requirements resulting from these infrastructure upgrades. There would be increased maintenance required for upkeep of the landscape in the new Park Over the Highway.

The construction projects listed above and the installation of the landscape on the structure over I-70 that would be constructed by MoDOT would require an increase in energy use and materials during construction, and thus short-term minor adverse impacts

would occur. In the long-term, these projects would not lead to an increase in energy use. If the Visitor Center/Museum roof replacement is more energy-efficient, beneficial impacts due to a reduction in energy consumption could occur.

The no-action alternative, as noted above, would result in minor short-term and minor to moderate long-term adverse impacts to operations and management. Combined with past, present, and reasonably foreseeable future actions, there would be short-term minor cumulative adverse impacts and long-term minor to moderate adverse cumulative impacts to operations and management. Long-term beneficial cumulative impacts would also occur.

### **Alternative 2: Moderate Change**

Park operations and management practices would be disrupted by construction and renovation activities proposed under alternative 2. Construction to install perimeter security elements, site grading for pedestrian accessibility elements, grading for drainage improvements and stormwater management, installation of utilities, streetscape improvements at the Old Courthouse, grading at Luther Ely Smith Square and the West Gateway to landscape the new plaza at Luther Ely Smith Square and the Park Over the Highway structure over I-70, replacement in-kind of the Processional Walks, and the replacement of some existing vegetation, renovations at the Visitor Center/Museum, and renovations at the Old Courthouse would all alter operations at the park for the duration of the construction period by limiting access to areas of the park. The construction to raise the elevation of Leonor K. Sullivan Boulevard and the pedestrian promenade and bicycle paths would limit access for park staff and maintenance to the East Slopes of the park during construction. In alternative 2, construction activities would increase energy and materials use and other resource requirements at the park along the Central Riverfront.

There would be long-term alterations to operations due to an increased need for NPS

management of activities and destinations on the park grounds and higher park visitation. In addition, while the revenue stream of the Arch Parking Garage would be maintained, the continued existence of the Arch Parking Garage would result in long-term maintenance needs. The new landscape on the Park Over the Highway would increase demands on park maintenance staff and increase maintenance costs. Collectively, these increased demands on park staff and operations would place additional burden existing budgets and schedules, without an increase in staff. Revenue from visitor fees would continue to be collected at the existing ticket counter locations for the Ride to the Top of the Arch and the films screened in the Visitor Center/Museum without a change to operations.

Improved maintenance conditions would include new HVAC and other facility systems, stormwater management that could help to control algae growth in the ponds, soil amendments and replacement of the aggregate concrete surfaces of the Processional Walks, and improved drainage. More sustainable landscape practices on the park grounds could result in increased energy and water conservation. The raising of the elevation of Leonor K. Sullivan Boulevard would reduce maintenance needs from flood clean-up.

Operations impacts related to construction under alternative 2 would include short-term minor to moderate adverse impacts due to increased use of energy and resources and limited access to areas of the park during construction. An increase in maintenance requirements would have a long-term minor adverse impact on park operations. Improved maintenance conditions, improved sustainability standards, and the potential for an overall reduction in energy and water use at the park would have long-term beneficial impacts.

### **Cumulative Impacts for Alternative 2**

Past, present, and reasonably foreseeable projects within the area of the park that have potential impacts on operations and

management include the same projects discussed earlier under alternative 1, the no-action alternative. Some cumulative projects would be incorporated into the design and construction process under alternative 2. The Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs are cumulative impact projects that would be incorporated into the design and construction process under alternative 2.

As noted above, this alternative would result in short-term minor to moderate adverse impacts and long-term minor adverse impacts to operations and management. Long-term beneficial impacts would also occur. Combined with past, present, and reasonably foreseeable future actions, there would be short-term minor to moderate adverse cumulative impacts, minor long-term adverse cumulative impacts, and long-term beneficial cumulative impacts.

### **Alternative 3: Maximum Change**

In addition to the construction activities described under alternative 2, other construction activities would occur under alternative 3 including construction of the new Visitor Center/Museum entrance at the West Gateway and the expanded Visitor Center/Museum structure under the Arch. Alternative 3 would also demolish the Arch Parking Garage and install new landscape features in the North Gateway including the Explorers Garden and new pedestrian paths and bikeways. These construction activities would alter operations at the park for the duration of the construction period by limiting access to areas of the park. The construction to raise the elevation of Leonor K. Sullivan Boulevard and the pedestrian promenade and bicycle paths would limit access for park staff and maintenance to the East Slopes of the park during construction. Construction, facility expansion, and renovation activities in the park and along the Central Riverfront would require an increase in energy use and materials.

Changes would occur to operations due to the issues noted in alternative 2, with increased management and operating costs

for the expanded Visitor Center/Museum and associated services, as well as the maintenance and costs of the additional landscaped surface area. Loss of revenue-producing parking due to the removal of the Arch Parking Garage could negatively affect the NPS and its partner, Metro, which operates the garage, reducing revenue. There would however, be no long-term maintenance costs related to upkeep on the existing garage. The ticket stations in the new lobby would generate operational efficiencies by creating one central location for visitor fees to be collected. An entrance fee for the Visitor Center/Museum would be collected, as well as any other fees for visitor experiences such as the Ride to the Top of the Arch. The addition of an entrance fee to the Visitor Center/Museum could generate additional revenue, depending on the fee structure that would be established and the number of visitors to the park.

Improved maintenance conditions would include new HVAC and other facility systems, stormwater management that could help to control algae growth in the ponds, soil amendments and replacement of the aggregate concrete surfaces of the Processional Walks, and improved drainage. Raising the elevation of Leonor K. Sullivan Boulevard would reduce city maintenance needs from flood clean-up.

New construction and renovations would meet energy efficiency and sustainability standards and could result in an overall reduction in energy use at the park. More sustainable landscape practices on the park grounds could result also in increased energy and water conservation.

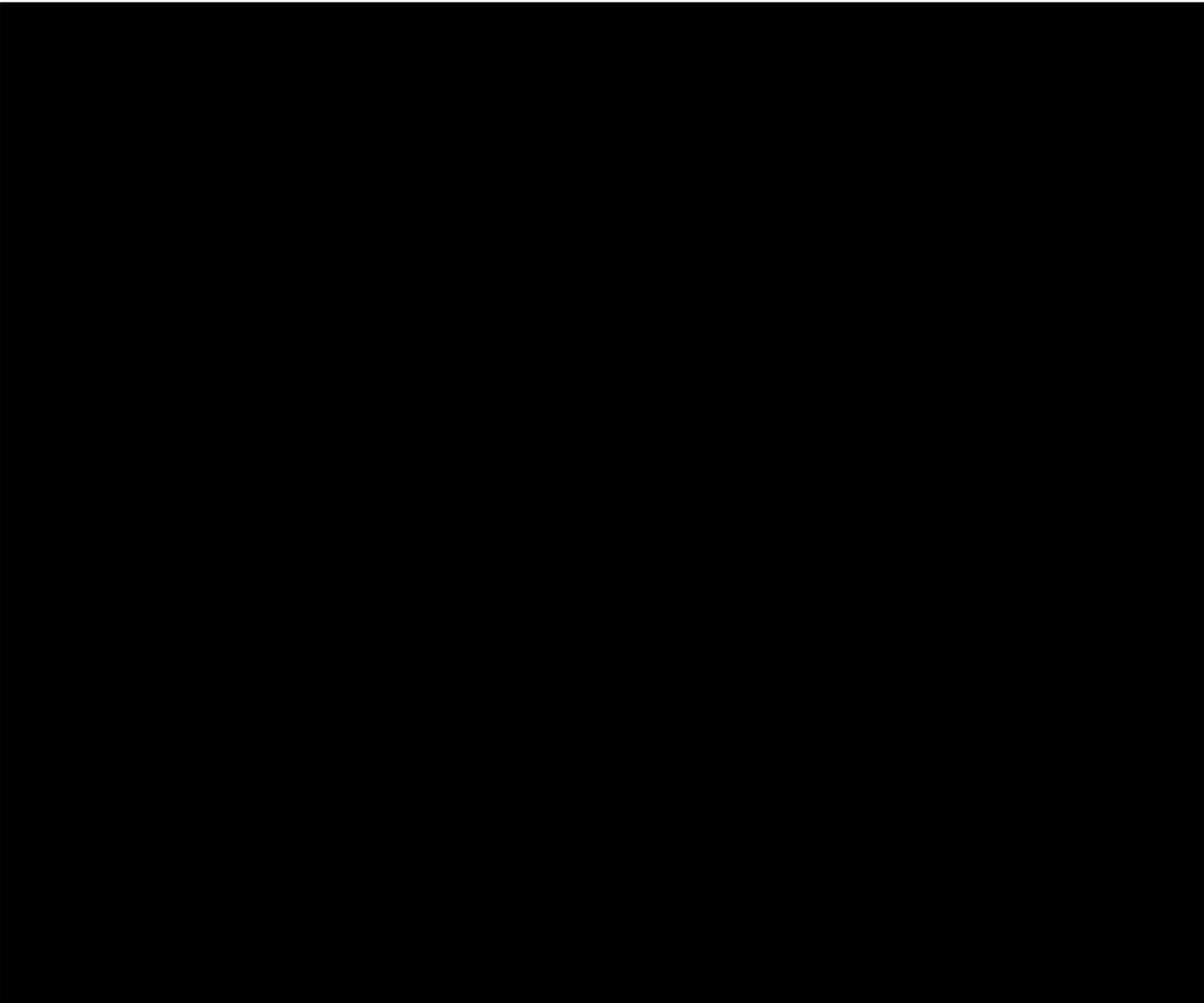
Operations impacts related to construction under alternative 3 would include short-term moderate adverse impacts due to increased use of energy and resources and limited access to areas of the park during construction. An increase in maintenance requirements and the loss of parking revenue would have a long-term minor adverse impact on park operations. Improved maintenance conditions, increased ticketing efficiency and revenue collection, improved energy

efficiency and sustainability standards, and the potential for an overall reduction in energy and water use at the park would have long-term beneficial impacts.

### **Cumulative Impacts for Alternative 3**

Past, present, and reasonably foreseeable projects within the area of the park that have potential impacts on operations and management include the same projects discussed earlier in this section under alternative 1. The Visitor Center/Museum roof replacement and repair of the North and South Overlook stairs are cumulative impact projects that would be incorporated into the design and construction process under alternative 3.

As noted above, this alternative would result in short-term moderate adverse impacts and long-term minor to moderate adverse impacts to operations and management. Long-term beneficial impacts would also occur. Combined with past, present, and reasonably foreseeable future actions, there would be short-term moderate adverse cumulative impacts, minor to moderate long-term adverse cumulative impacts, and long-term beneficial cumulative impacts.



# 5. Consultation and Coordination

Jefferson National Expansion Memorial  
Environmental Assessment for Implementing CityArchRiver Initiative Elements



# Consultation and Coordination

The intent of NEPA is to encourage the participation of federal and state-involved agencies and affected citizens in the assessment process, as appropriate. Throughout the development of this EA, substantial coordination efforts have been undertaken to provide and solicit information from federal, state, and local officials, as well as the general public. This chapter provides a summary of the outreach and consultation activities associated with the proposed project, as well as a list of preparers and a list of the recipients receiving notification of the document's publication.

## COOPERATING AGENCIES

FHWA and MoDOT manage the highway infrastructure around the park and are completing a concurrent environmental assessment on the construction of the proposed structure over the depressed lanes of I-70 and other transportation infrastructure changes adjacent to the park. NPS and FHWA/MoDOT are simultaneously preparing NEPA documents which address CityArchRiver 2015 Initiative project components, and because of jurisdiction and/or special expertise, each agency requested the participation of the other as a cooperator. On October 7, 2011, NPS, FHWA and MoDOT signed a Memorandum of Understanding (MOU) formalizing that cooperation. Per this agreement, the NPS, FHWA, and MoDOT are coordinating to ensure that alternatives are fully explored, and impacts of the proposed projects are accurately assessed.

## HISTORY OF PUBLIC INVOLVEMENT

Coordination, consultation, and public involvement in this overall planning process began with the initiation of the GMP in 2008. The GMP public involvement process is detailed in Chapter 5 of the GMP on pages 5-1 to 5-7 and involved the publication of newsletters and press releases, public meetings and open houses, information posted to the park's planning website, public comment periods for the draft and final GMP, and agency consultation.

With the initiation of the CityArchRiver 2015 design competition, as recommended by the GMP, further public involvement occurred both during the design competition and after the winner was announced. In September 2010 the jury identified Michael Van Valkenburgh Associates (MVVA) as the winner of the design competition. After being chosen to move forward with their design, the design team coordinated with the National Park Service, the City of St. Louis and others, and this coordination is ongoing. The design team provided information to the public about the design's progress at public presentations in January 2011 and January 2012. MoDOT held a public meeting on the alternatives considered in the FHWA/MoDOT EA in April 2012, and on the FHWA/MoDOT EA in August 2012.

The public involvement activities described below for this plan/EA fulfill the requirements of NEPA and the NPS Director's Order 12 (NPS 2011a).

## THE SCOPING PROCESS

The NPS divides the scoping process into two parts: internal scoping and external or public scoping. Internal scoping involves discussions among NPS personnel regarding the purpose of and need for actions, issues, alternatives, mitigation measures, the analysis boundary, appropriate level of documentation, available references and guidance, and other related topics.

Public scoping is the early involvement of the interested and affected public in the environmental assessment process. The public scoping process helps ensure that people have an early opportunity to comment and contribute early in the decision-making process. Taken together, internal and public scoping are essential elements of the NEPA planning process. The following sections describe the various ways scoping was conducted for this EA.

### INTERNAL SCOPING

Internal scoping meetings were held at the park grounds maintenance building training facility on May 18, 2011. The meeting was held with the NPS Interdisciplinary Planning Team convened for this plan, as well as other park staff, design team members, CityArchRiver 2015 Initiative representatives, and MoDOT representatives. These personnel attended the meeting to define the purpose, need, and objectives of the plan, identify potential issues, discuss preliminary alternatives, define data needs, and discuss the project schedule and overall coordination. The results of the meetings were captured in a report now on file as part of the administrative record.

### PUBLIC SCOPING

A public scoping newsletter was published on July 22, 2011 for review and comment, and initiated an early opportunity to submit comments on the scope of the project. The scoping newsletter summarized the purpose, need, and objectives for this plan/EA, described the scope of the EA, and listed the proposed impact topics for the EA analysis.

The scoping newsletter and questions to initiate public comment were posted on the NPS Planning, Environment, and Public Comment (PEPC) website. Additionally, a postcard announcing the availability of the newsletter on PEPC was mailed to the project's preliminary mailing list of government agencies, tribes, organizations, businesses, and individuals. The scoping newsletter was also emailed to those on the mailing list with an email address. Hard copies of the newsletter were available at the park. NPS published a Notice of Intent to prepare this EA in the Federal Register on July 26, 2011.

Through August 30, 2011, the public was invited to submit comments on the scope of the planning process; the statements of purpose, need and objectives; alternatives; and potential impacts of the proposed project. The NPS accepted comments via the NPS PEPC website at [www.parkplanning.nps.gov/jeff](http://www.parkplanning.nps.gov/jeff), by mail, and by hand delivery to the park. During the scoping period 123 pieces of correspondence were entered into the PEPC system either via direct entry by the commenter, or by uploading emails and hard-copy letters that had been sent to the NPS.

**A correspondence is the entire document received from a commenter. It can be in the form of a letter, email, written comment form, note card, open house transcript, or petition.**

### PUBLIC SCOPING COMMENT ANALYSIS PROCESS

Comment analysis is a process used to compile and correlate similar public comments into a format that can be used by decision makers and the Jefferson National Expansion Memorial EA team. Comment analysis assists the team in organizing, clarifying, and addressing technical information pursuant to NEPA regulations. It also aids in identifying the topics and issues to be evaluated and considered throughout the planning process and the development of the EA.

The process includes five main components:

- Developing a coding structure;
- Employing a comment database for comment management;
- Reading and coding the public comments;
- Interpreting and analyzing the comments to identify issues and themes; and
- Preparing a comment summary.

A coding structure was developed to help sort comments into logical groups by topics and issues. It was developed using planning issues identified during internal NPS scoping, past planning documents such as the park's 2009 General Management Plan and the CityArchRiver 2015 design competition goals, and from the comments themselves. The coding structure was designed to capture all comment content rather than to restrict or exclude any ideas.

The NPS PEPC database was used for management of the comments. The database stores the full text of all correspondence and allows each comment to be coded by topic and issue. Analysis of the public comments involved the assignment of codes to statements made by the public in their PEPC entries, letters, and email messages. All comments were read and analyzed, including those of a technical nature; opinions, feelings, and preferences of one element or one potential alternative over another; and comments of a personal or philosophical nature. All comments were considered, whether they were presented by several people saying the same thing or by a single person expressing a unique viewpoint.

A Comment Analysis Report was then prepared that summarized concern statements as well as the full text of all comments corresponding to the appropriate concern statement. All scoping comments were considered to be important as useful guidance and public input to the public scoping process.

With regard to development of the plan/EA, comments in favor of or against the proposed action or alternatives, those that only agree or disagree with NPS policy, and those that offer opinions or provide information not directly related to the issues or impact analysis, such as for projects outside the scope of this EA, were considered non-substantive comments.

**A comment is a portion of the text within a correspondence that addresses a single subject. It could include such information as an expression of support or opposition to the use of a potential management tool, additional data regarding the existing condition, or an opinion debating the adequacy of an analysis.**

## PUBLIC SCOPING COMMENTS

After reviewing and categorizing all of the comments within each correspondence received during public scoping, 329 comments were identified and coded appropriately. The coded comments were released to the public on PEPC. Of these, 77 comments were considered substantive. The topic addressed by the majority of the comments was transportation infrastructure surrounding the park and in particular, the removal of the depressed lanes of I-70. Transportation infrastructure is being considered under a separate but concurrent EA being prepared by the Missouri Department of Transportation, and is outside NPS jurisdiction and the scope of this EA. Therefore, the comments were considered non-substantive for the NPS EA. The comments received by NPS pertaining to transportation infrastructure were provided to MoDOT to inform their EA process. Within the scope of this EA, topics that received comments considered substantive included: requests for a specific visitor experience and/or a particular visitor amenity or opportunity at the park; ideas or suggestions for new alternatives; and the need for greater connectivity in the vicinity of the park.

## AGENCY SCOPING AND CONSULTATION

The NPS has coordinated and consulted with local, state, and federal agencies and tribal governments during the NEPA process to identify issues and/or concerns related to proposed projects at the park and along the Central Riverfront. During scoping, these entities received a postcard and/or newsletter described under ‘Public Scoping’. In addition, certain agencies have specific consultation requirements that must also be met. These consultations are described in more detail below. Consultation is ongoing throughout the NEPA process and in some cases will continue after its conclusion.

### Section 106 and National Historic Preservation Act (Public Law 89-665; 16 U.S.C. 470 et seq.)

By passage of the NHPA in 1966, Congress established a comprehensive program to preserve the historical and cultural foundations of the nation as a living part of community life. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties either listed in or eligible to be listed in the National Register of Historic Places. The National Register includes districts, sites, buildings, structures, and objects important for their significance in American history, architecture, archeology, engineering, and culture. Historic properties listed in the National Register can be significant to a local community, a state, an American Indian tribe, or the nation as a whole.

The historic preservation review process required by Section 106 is outlined in regulations (36 CFR Part 800, Protecting Historic Properties) issued by Advisory Council on Historic Preservation (ACHP), an independent federal agency established by the NHPA in 1966 to promote the preservation, enhancement, and productive use of our nation’s historic resources. The goal of the Section 106 review process is to seek ways to avoid, minimize, or mitigate any adverse effects to historic properties. Section 106 review ensures that preservation values are factored into federal agency planning and decision making, that federal agencies assume

responsibility for the consequences of their actions on historic properties and are publicly accountable for their decisions.

Federal agencies are responsible for initiating Section 106 review, much of which takes place between the agency, the ACHP, and state and/or tribal officials. The state historic preservation officer administers the national historic preservation program at the state level, coordinates the state’s historic preservation program, and consults with federal agencies during Section 106 review. Federal agencies also consult with officials of federally recognized American Indian tribes when tribal lands or historic properties of significance to such tribes are involved, as well as representatives of state and local governments, agencies and organizations, and the general public.

The NPS has identified historic properties listed in or eligible for listing in the National Register of Historic Places within the broadly defined area of potential effects of the revitalization of the Jefferson National Expansion Memorial. However, due to the relative uncertainty of the nature of potential projects or actions on park lands, the NPS and its consulting parties cannot yet fully assess the potential effects of these projects or actions on historic properties. Therefore, the NPS and its consulting parties entered into a programmatic agreement (PA), in accordance with 36 CFR 800.14(b), which records the terms and conditions agreed upon for review of site specific design as it becomes available. The NPS commits to complete Section 106 review for each project or action that may stem from the revitalization of the Jefferson National Expansion Memorial in accordance with the terms and conditions of this PA, which is included in Appendix D of this environmental assessment.

Great Rivers Greenway has pursued Section 106 compliance for the Central Riverfront improvements separately from the process for projects covered by the PA. Consultation and coordination between GRG and NPS are ongoing for this process, and documentation of the results will be included in the NEPA decision document.

### U.S. Fish and Wildlife Service

Pursuant to the Endangered Species Act, the NPS initiated informal consultation with the U.S. Fish and Wildlife Service by sending a memorandum to the Columbia Ecological Services Field Office and Marion Illinois Sub-Office on July 21, 2011 (see Appendix B). This memorandum documented the NPS determination that the project elements under consideration at that time were not likely to have an adverse effect on listed species, their habitats, or proposed or designated critical habitat.

Because of the addition of the Central Riverfront project and the time that has passed since the first letter was sent to USFWS, the NPS sent a follow-up letter to the Columbia Ecological Services Field Office and the Marion Sub Office, on August 28, 2012 (see Appendix B). Despite this addition, the NPS still determined that the project would have no effect on listed species, their habitats, or critical habitat, and is awaiting concurrence from the U.S. Fish and Wildlife Service.

### U.S. Army Corps of Engineers

Portions of the Central Riverfront project would be constructed below the ordinary high water mark of the Mississippi River. In addition, this project would require adjustments to the floodwall closure systems and floodgates in the vicinity of the park. As a result, consultations have been conducted with the U.S. Army Corps of Engineers—St. Louis District Regulatory Group regarding permits required pursuant to Section 404 of the Clean Water Act; and with the U.S. Army Corps of Engineers—St. Louis District Readiness Group regarding regulatory review of the floodwall changes.

### Tribal Consultations

The appropriate level of Tribal government has been consulted during development of this EA. Representatives from the Osage Nation and the Peoria Tribe of Indians of Oklahoma were consulted during scoping. A response was received from the Osage Nation

requesting a copy of the EA and from the Peoria Tribe of Oklahoma requesting to be added to all relevant mailing lists for the park and expressing an interest in consulting on the project (see Appendix C for a copy of these responses). In addition, numerous other tribes have been consulted as part of the Section 106 process described previously. These tribes (see “List of Recipients of the Plan/Environmental Assessment” on page 172) have all been notified of the availability of the EA.

### Metropolitan St. Louis Sewer District

The NPS and design team have met with the Metropolitan St. Louis Sewer District (MSD) to discuss the CityArchRiver 2015 Initiative and the planning and permitting necessary for implementing elements on park property. Issues addressed have included applicability of federal versus local guidelines, review process for connections to existing outfall systems, best management practices, and opportunities to use cost-effective, sustainable, and environmentally friendly infrastructure. The NPS and design team anticipate future coordination with MSD as the project moves into schematic design.

## **LIST OF RECIPIENTS OF THE PLAN/ENVIRONMENTAL ASSESSMENT**

Notification of the availability of this EA will be sent to the following agencies, tribes, organizations, and businesses, as well as other entities and individuals who requested a copy, are on the park's mailing list, or participated during the public scoping process.

### **FEDERAL DEPARTMENTS AND AGENCIES**

Advisory Council of Historic Preservation  
Federal Executive Board of St. Louis  
Federal Highway Administration  
Library of Congress  
National Trust for Historic Preservation  
U.S. Army Corps of Engineers  
U.S. Coast Guard  
U.S. Environmental Protection Agency  
U.S. Department of Interior  
    Fish and Wildlife Service  
    National Park Service  
    Denver Service Center  
    Harpers Ferry Center  
    Midwest Archeological Center  
    Midwest Regional Office  
    Ulysses S. Grant National Historic Site  
U.S. Department of Justice, US. Attorney's Office

### **STATE AGENCIES**

Bi-State Development Agency  
Illinois Department of Transportation  
Illinois Division of State Parks  
Illinois Historic Preservation Agency  
Missouri Department of Natural Resources  
Missouri Department of Transportation  
Missouri Division of Tourism  
Missouri State Archives  
Missouri State Emergency Management Agency  
Missouri State Historic Preservation Office

## **COUNTY AND LOCAL GOVERNMENTS**

City of East St. Louis-Mayor  
City of St. Louis Board of Aldermen  
City of St. Louis Fire Department  
City of St. Louis Office of the Mayor  
City of St. Louis Office of Special Events  
City of St. Louis Parks and Recreation  
City of St. Louis Planning and Urban Design Agency  
City of St. Louis Police Department  
City of St. Louis Port Authority  
City of St. Louis Street Department  
East West Gateway Council of Governments  
Great Rivers Greenway District  
Madison County Board  
Madison County Transit  
Metro East Parks and Recreation District  
Metropolitan St. Louis Sewer District  
St. Louis County Office of the Executive  
St. Louis County Parks and Recreation

### **NATIVE AMERICAN TRIBES**

Absentee-Shawnee Tribe of Indians of Oklahoma  
Delaware Tribe of Indians of Oklahoma  
Eastern Shawnee Tribe of Oklahoma  
Iowa Tribe of Kansas and Nebraska  
Iowa Tribe of Oklahoma  
Kaw Nation  
Kickapoo Tribe in Kansas  
Miami Tribe of Oklahoma  
Muscogee (Creek) Nation of Oklahoma  
Osage Nation  
Peoria Tribe of Oklahoma  
Ponca Tribe of Nebraska  
Quapaw Tribe of Oklahoma  
Sac and Fox Tribe of the Mississippi in Iowa  
Sac and Fox Tribe of the Missouri in Kansas and Nebraska

### **OTHER ORGANIZATIONS**

CityArchRiver 2015 Foundation  
Landmarks Association of St. Louis  
Missouri Preservation

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## GLOSSARY

**Accessibility** — the design, construction and/or alteration of a building or facility that is in compliance with officially sanctioned design standards, and that can be entered, and used by individuals with a disability. The concept is used to ensure that programs, activities and opportunities provided to visitors and/or employees will be provided in such a way that individuals with disabilities are not excluded from, nor denied the benefits of, that program or activity. See also “universally accessible.”

**Action Alternative** — An alternative that proposes a different management action or actions to address the purpose, need, and objectives of the plan; one that proposes changes to the current management. Alternatives 2 and 3 are the action alternatives in this planning process. See also: “No-Action Alternative.”

**Affected Environment** — The existing environment which may be affected by the alternatives considered.

**Character-defining feature** — A prominent or distinctive aspect, quality, or characteristic of a historic property that contributes significantly to its physical character. Structures, objects, vegetation, spatial relationships, views, furnishings, decorative details, and materials may be such features.

**Code** — A grouping used to sort public comments by similar topics or issues.

**Comment** — A comment is a portion of the text within a correspondence that addresses a single subject. It could include such information as an expression of support or opposition to the use of a potential management tool, additional data regarding the existing condition, or an opinion debating the adequacy of an analysis.

**Concern** — Concerns are statements that summarize the issues identified by each code. Each code was further characterized by concern statements to provide a better focus on the content of comments. Some codes required multiple concern statements, while others did not.

**Correspondence** — A correspondence is the entire document received from a commenter. It can be in the form of a letter, email, written comment form, note card, open house transcript, or petition.

**Council on Environmental Quality (CEQ)** — Established by Congress within the Executive Office of the President with passage of the National Environmental Policy Act of 1969. CEQ coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives.

**Cultural Landscape** — A geographic area (including both cultural and natural resources and the wildlife or domestic animals therein) associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.

**Cultural Landscape Report** — A report that serves as the primary guide to treatment and use of a cultural landscape, and that prescribes the treatment and management of the physical attributes and biotic systems of a landscape, and use when use contributes to historical significance.

**Cultural Resources** — Prehistoric and historic districts, sites, buildings, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reason.

**Cumulative Impacts** — Those impacts on the environment that result from the incremental effect of the action when added to the past, present, and reasonable foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time and can be adverse or beneficial (40 CFR 1508.7).

**Environmental Assessment (EA)** — An environmental analysis prepared pursuant to the National Environmental Policy Act that discusses the purposes and need for an action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an

environmental impact statement or finding of no significant impact.

**Environmental Consequences** —

Environmental effects of project alternatives, including the proposed action, any adverse environmental effects which cannot be avoided, the relationship between short-term uses of the human environment, and any irreversible or irretrievable commitments of resources which would be involved if the proposal should be implemented (40 CFR 1502.16).

**Environmental Impact Statement (EIS)**

— A detailed written statement required by Section 102(2)(C) of NEPA, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources (40 CFR 1508.11).

**Executive Order** — Official proclamation issued by the President that may set forth policy or direction or establish specific duties in connection with the execution of federal laws and programs.

**Finding of No New Significant Impact**--A finding of no significant impact other than those already disclosed and analyzed in the environmental impact statement to which an environmental assessment is tiered (43 CFR 46.140(c); see also definition of tiering).

**Finding of No Significant Impact (FONSI)**

— A document prepared by a federal agency showing why a proposed action would not have a significant impact on the environment and thus would not require preparation of an Environmental Impact Statement. A FONSI is based on the results of an Environmental Assessment.

**Floodplain** — The flat or nearly flat land along a river or stream or in a tidal area that is covered by water during a flood.

**General Management Plan** - A plan developed to guide park management, usually for 15 to 20 years. The purpose of the plan is to ensure that each park has a clearly defined direction for decision making with regard to resource preservation and visitor use. It is developed in consultation with servicewide program managers, interested parties, and the general public, and is subject to NEPA.

**Human Environment** — The natural and physical environment and the relationship of people with that environment (40 CFR 1508.14)

**Mitigation** — Modification of a proposal to lessen the intensity of its impact on a particular resource.

**National Historic Landmark** — A district, site, building, structure, or object of national historical significance, designated by the Secretary of the Interior under authority of the Historic Sites Act of 1935 and entered in the National Register of Historic Places.

**National Register of Historic Places**

(**National Register**) — A register of districts, sites, buildings, structures, and objects important in American history, architecture, archaeology, and culture, maintained by the Secretary of the Interior under authority of Section 2(b) of the Historic Sites Act of 1935 and Section 101(a)(1) of the National Historic Preservation Act of 1966, as amended.

**No-Action Alternative** — The alternative in which baseline conditions and trends are projected into the future without any substantive changes in management (40 CFR 1502.14(d)). Alternative 1 is the no-action alternative in this planning process.

**Record of Decision** — The document which is prepared to substantiate a decision based on an analysis (e. g., an EIS). When applicable, it includes a detailed discussion of rationale and reasons for not adopting all mitigation measures analyzed.

**Scoping** — An early and open process for determining the extent and variety of issues to be addressed and for identifying the significant issues related to a proposed action (40 CFR 1501.7).

**Section 106 Compliance** — Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to take into account the effects of their proposed undertakings on properties included or eligible for inclusion in the National Register of Historic Places and give the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed undertakings. The Section 106 review process seeks ways to avoid, minimize, or mitigate any adverse effects to historic properties.

**Soil amendment** — Material added to a soil to improve its physical properties, such as water retention, permeability, water infiltration, drainage, aeration and structure.

**Statement of Findings** — Separately identifiable document attached to NPS NEPA decision documents that explains why an action would adversely impact wetlands or floodplains, what alternatives were considered to avoid these impacts and why they are not suitable, mitigation measures to minimize adverse impacts, and what the effects on floodplain and/or wetland values would be. Preparation, review, and public disclosure of statements of findings are key elements of the NPS process for implementing Executive Order 11990, Protection of Wetlands, and Executive Order 11998, Floodplain Management.

**Stormwater** — Stormwater runoff is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground. As the runoff flows over the land or impervious surfaces (paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the runoff is discharged untreated.

**Swale** — In the context of stormwater management, the term swale (a.k.a. grassed channel, dry swale, wet swale, biofilter, or bioswale) refers to a vegetated, open-channel management practices designed specifically to treat and attenuate stormwater runoff for a specified water quality volume. As stormwater runoff flows along these channels, it is treated through vegetation slowing the water to allow

sedimentation, filtering through a subsoil matrix, and/or infiltration into the underlying soils

**Tiering** - Refers to covering general matters in broader environmental impact statements (e.g., the GMP for Jefferson National Expansion Memorial) with subsequent narrower statements or environmental analyses (e.g., this EA) focused on specific issues; tiering to the programmatic or broader-scope environmental impact statement allows the preparation of an environmental assessment and a finding of no (or no new) significant impact for a proposed action, so long as any previously unanalyzed effects are not significant (40 CFR 1508.28; 43 CFR 46.140)

**Universally Accessible** - The design of products, communications, and environments to be simple and usable by people of all ages, size, and abilities (including disabilities), without the need for special adaptations or specialized design.

## ACRONYMS

ACHP: Advisory Council on Historic Preservation

ADA: Americans With Disabilities Act

ABAAS: Architectural Barriers Act Accessibility Standard

APE: Area of Potential Effects

BLS: Bureau of Labor Statistics

BMP: Best Management Practice

CEQ: Council on Environmental Quality

CFR: Code of Federal Regulations

CLR: Cultural Landscape Report

CVC: St. Louis Convention & Visitors Commission

dB: Decibel

DO: Director's Order

EA: Environmental Assessment

EAB EA: Emerald Ash Borer Environmental Assessment

EIS: Environmental Impact Statement

EO: Executive Order

EPA: Environmental Protection Agency

FEMA: Federal Emergency Management Agency

FHWA: Federal Highway Administration

FIRM: Flood Insurance Rate Map

FTE: Full-time equivalent staff position

GMP: General Management Plan

GRG: Great Rivers Greenway District

HVAC: Heating, ventilation, and air conditioning system

IDOT: Illinois Department of Transportation

IMP: Integrated Pest Management

JNPA: Jefferson National Parks Association

MDNR: Missouri Department of Natural Resources

MoDOT: Missouri Department of Transportation

MOU: Memorandum of Understanding

MSA: Metropolitan Statistical Area

MSD: Metropolitan Sewer District

MVVA: Michael Van Valkenburgh Associates

MX: Mercantile Exchange

NEPA: National Environmental Policy Act

NFIP: National Flood Insurance Program

NHL: National Historic Landmark

NHPA: National Historic Preservation Act

NPS: National Park Service

NWI: National Wetlands Inventory

PA: Programmatic Agreement

PEPC: Planning, Environment and Public Comment

RCP: Reinforced concrete pipe

ROD: Record of Decision

RV: Recreational Vehicle

SHPO: State Historic Preservation Officer

SLDC: Saint Louis Development Corporation

SOF: Statement of Findings

TAG: Technical Advisory Group

TDD: Telecommunications Device for the Deaf

TMDL: Total Maximum Daily Load

TRRA: Terminal Railroad Association

USACE: United States Army Corps of Engineers

USC: United States Code

USFWS: United States Fish and Wildlife Service

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# Appendices

Jefferson National Expansion Memorial  
Environmental Assessment for Implementing CityArchRiver Initiative Elements



**APPENDIX A**  
**DRAFT FLOODPLAIN STATEMENT OF FINDINGS**





**National Park Service**  
**U.S. Department of the Interior**

Jefferson National  
Expansion Memorial

11 North 4th Street  
St. Louis, MO 63102

314-655-1700 phone  
314-655-1641fax

**Midwest Region**

---

## **FLOODPLAIN STATEMENT OF FINDINGS**

*For the implementation of the CityArchRiver 2015 at the East Slopes and Central Riverfront*

St. Louis, Missouri

September, 2012

Recommended:

\_\_\_\_\_  
Tom Bradley  
Superintendent JEFF  
Date

Concurred:

\_\_\_\_\_  
Bill Jackson  
Division Chief - Water Resources  
Date

Approved:

\_\_\_\_\_  
Michael Reynolds  
Regional Director – Midwest Region  
Date

## STATEMENT OF FINDINGS

### INTRODUCTION

Executive Order 11988 ("Floodplain Management") requires the National Park Service (NPS) and other agencies to evaluate the likely impacts of actions in floodplains. It is NPS policy to preserve floodplain values and minimize potentially hazardous conditions associated with flooding. If a proposed action is in an applicable regulatory floodplain, then flood conditions and associated hazards must be identified, and a formal Statement of Findings (SOF) must be prepared. The NPS Procedural Manual #77-2, Floodplain Management provides direction for the preparation of a floodplain SOF. This SOF has been prepared to comply with EO 11988 and with Procedural Manual #77-2.

### PROJECT DESCRIPTION

The National Park Service (NPS) has prepared an Environmental Assessment (EA) to evaluate a range of alternatives to implement elements of the CityArchRiver 2015 Initiative (Figure 1) at Jefferson National Expansion Memorial (the park) in St. Louis, Missouri. Some of the actions contemplated in the EA would occur between the East Slopes of the park and the Mississippi River within the regulated floodplain. This includes the revitalization of the Central Riverfront by Great Rivers Greenway District (GRG), which the NPS has provided funding for, and is located adjacent to the park. As part of this action, Leonor K. Sullivan (LKS) Boulevard, from Chouteau Avenue to Biddle Street, will be raised to reduce the frequency and impact of flood events. The proposed improvements would also convert the existing 2-lane roadway section with periodic left turn lanes into a narrower 2-lane roadway section with designated areas for bus drop-off/pick-up lanes and establish a new 2-way bike path separated from the vehicle travel lanes. A new pedestrian Promenade would be created between the bike path and the historic cobble of the levees adjacent to the river. Traffic calming measures include raised pedestrian crossings at the base of the Grand Staircase and at the new crosswalk locations at the base of the East Slope paths.

Raising the elevation of LKS would require modifications to the floodwall and levee system along the Mississippi River. Modifications to floodwall closure structures at Chouteau Avenue, Poplar Street, and Carr Street would be required. This work would include raising the sills of the closure structures and modifications to the closure structure panel systems at each location. Additionally, raising LKS would require the placement of fill against existing structures within the public right-of-way as well as construction of new retaining walls along the levee.

In addition, the East Slopes would be regraded, and subsequently replanted, to develop two-four universally accessible serpentine paths between the riverfront and Arch grounds and raise the sidewalk at the base of the slopes to meet the new roadway elevations. Grading of the slopes would be performed to balance cut and fill in an effort to limit the import and export of fill when feasible. The general form of the existing slopes would be retained while accommodating the myriad of new path systems.

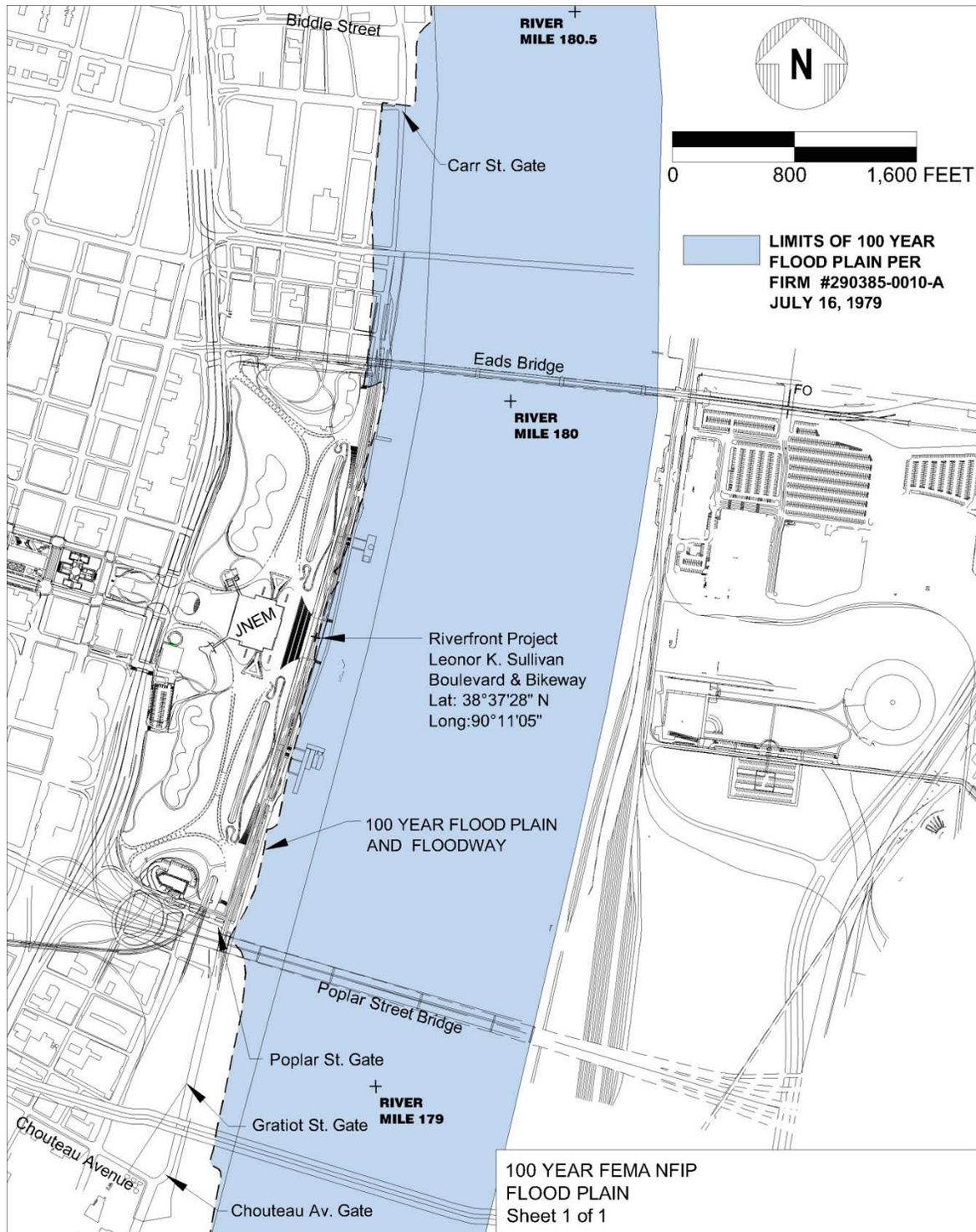


Figure 1: 100-year FEMA Floodplain and the Project Area

**SITE DESCRIPTION**

Portions of the East Slopes in the park and entire Central Riverfront project area lies within the regulatory 100-year (1%) Mississippi River floodplain as mapped by the Federal Emergency Management Association (FEMA) National Flood Insurance Program (NFIP). The floodway portion of the River is confined by a floodwall/levee system on both the east side of the River (Illinois bank) and the west side of the River (Missouri bank). The floodwall/levee system essentially “squeezes” the floodplain into a relatively narrow floodway.

Floodplains are defined by the NPS Procedural Manual 77-2: Floodplain Management (NPS 2003) as “the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, and including, at a minimum, that area subject to temporary inundation by a regulatory flood.” Typically floodplains function to contain flood waters. Floodplains can also provide habitat for various flora and fauna especially the islands that are temporarily formed by shifting river sediments. This portion of the Mississippi River floodplain has been highly industrialized with several river ports / transfer loading facilities located within what is referred to as the St Louis Harbor.

#### **JUSTIFICATION FOR USE OF THE FLOODPLAIN**

Portions of the project area are located within designated high hazard floodplains. Although the NPS is under executive order and policy to reduce or eliminate development in floodplains, this is not possible in the project area because the proposed improvements to the East Slopes, Central Riverfront, and LKS Boulevard are located within a 100-year floodplain.

#### **DESCRIPTION OF SITE-SPECIFIC FLOOD RISK**

The Central Riverfront lies at a low elevation and is relatively flat. The project area, stretching from Choteau Avenue to Biddle Street from the bank of the Mississippi River to the railroad on the East Slopes within the park is currently designated as Zone AE, which is within the 100-year floodplain (per the current FEMA mapping). West of this area, the park is shown to be protected from the 1% annual chance or greater flood hazard due to the levee system that has been provisionally accredited (per current FEMA mapping).

A one-hundred-year flood is calculated to be the level of flood water expected to be equaled or exceeded every 100 years on average. The 100-year flood can also be thought of as a 1 percent flood, since it is a flood that has a 1 percent chance of being equaled or exceeded in any single year. Along the Central Riverfront, flood occurrences that just overtop LKS Boulevard are far more frequent than the larger 100-year flood events that close the floodgates. These higher-frequency floods typically last up to two weeks and cause the closure of LKS.

#### **DESCRIPTION AND EXPLANATION OF FLOOD MITIGATION PLANS**

The proposed project itself constitutes a strategy for the reduction of flood risk. By raising LKS Boulevard along the Central Riverfront, the project aims to mitigate the effects of annual flooding and the associated impacts to public safety, visitor use and experience, and historic resources. Because the City of St. Louis is a member of the National Flood Insurance Program, Great Rivers Greenway District would need to apply for and obtain a Floodplain Development Permit. A Riverine Hydraulic Analysis of the proposed improvements must be completed in advance to assure the City that a “no-rise” to the 100-year base flood elevation will exist after the proposed improvements are constructed. As a result, the project would be designed to minimize the number of flood events that closes the roadway but would not affect the 100-year flood base elevations.

During site preparation and construction, efforts to preserve existing vegetation within the floodplain would be undertaken as standard procedures. Any vegetation removed to accommodate the proposed improvements would be replaced within the flood zone. Floodplain values would be protected to the maximum extent possible. Although the project must occur within the floodplain, the extent of development, placement of structures, and types of structures would be selected to minimize impacts.

#### **SUMMARY**

The proposed project constitutes enhancements for public safety, visitor use and experience, and historic resources, and must be carried out within the 100-year floodplain. Specifically, the proposed improvements to the East Slopes, Central Riverfront, and Leonor K. Sullivan Boulevard are within the 100-year floodplain. There are no other siting alternatives that could be considered for this project. Mitigation and compliance with regulations and policies to prevent impacts to water quality, floodplain values and loss of property or human life would be strictly adhered to during and after construction. Potential flood hazards would be minimized and there would be no long-term adverse impacts to the 100-year designated floodplain. To the contrary, the decreased flood events along the Central Riverfront would have beneficial effects on public safety, visitor use and experience, and historic resources at Jefferson National Expansion Memorial and along the Central Riverfront.

**APPENDIX B**  
**U.S. FISH AND WILDLIFE CORRESPONDENCE**





IN REPLY REFER TO:

# United States Department of the Interior

NATIONAL PARK SERVICE  
Jefferson National Expansion Memorial  
11 North Fourth Street  
St. Louis, Missouri 63102-1882

August 28, 2012

L76 (JEFF)  
XD18

## Memorandum

To: Amy Salveter, Field Supervisor, Columbia Ecological Services Field Office,  
U.S. Fish & Wildlife Service

From: Tom Bradley, Superintendent, Jefferson National Expansion Memorial,  
National Park Service

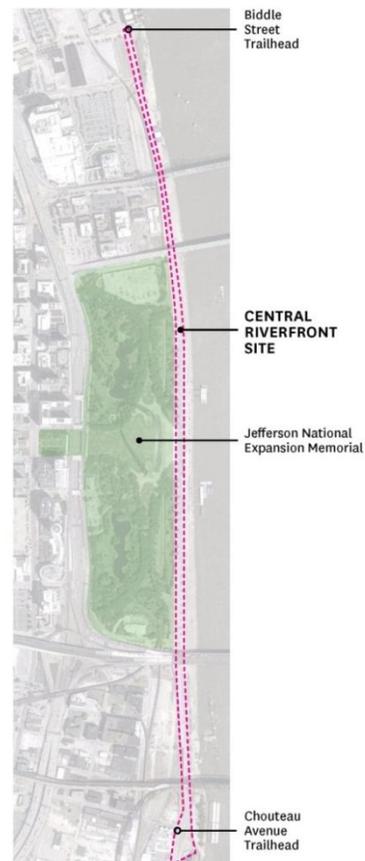
Subject: Informal Consultation under the Endangered Species Act—Implementation of  
CityArchRiver 2015 Initiative at Jefferson National Expansion Memorial and Along  
the Central Riverfront

Per our initial communication dated July 22, 2011, the National Park Service (NPS), in accordance with the National Environmental Policy Act, is preparing an Environmental Assessment (EA) to evaluate alternatives for implementing CityArchRiver 2015 initiative elements at Jefferson National Expansion Memorial (the park) in St. Louis, Missouri. The scope of the EA has since been expanded to include not only projects within the park boundary, but also the central riverfront, as depicted in figure 1.

The proposed action involves physical changes to the park and the central riverfront as a method for improving visitor access and experience, while better connecting the river and the park into downtown St. Louis. The project does not involve the development of any properties on the east side of the Mississippi River.

The major components of the project currently under consideration include:

- a landscaped "Park Over the Highway" (to be constructed by the Missouri Department of Transportation) over the depressed lanes of Interstate 70 between the Gateway Arch grounds and downtown;
- renovation of the underground museum and a new entrance;



**Figure 1. Project Area**

- accessibility improvements and new exhibits in the Old Courthouse;
- development of accessible trails from the park to the riverfront;
- expanded visitor programming and amenities on the Gateway Arch grounds;
- improvements to the sustainability of the landscape at the park;
- raising the elevation of Leonor K. Sullivan Boulevard from Chouteau Avenue to Biddle Street; and
- development of pedestrian and two-way bicycle paths along the central riverfront.

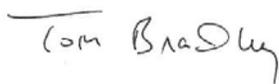
According to the U.S. Fish and Wildlife Service's website, the following listed threatened and endangered species are known to occur in St. Louis County, Missouri and St. Clair County, Illinois: Gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), Least tern (*Sterna antillarum*), Pallid sturgeon (*Scaphirhynchus albus*), Pink mucket (pearlymussel) (*Lampsilis abrupta*), Scaleshell mussel (*Leptodea leptodon*), Sheepnose mussel (*Plethobasus cyphus*), Snuffbox mussel (*Epioblasma triquetra*), Spectaclecase (*Cumberlandia monodonta*), Illinois cave amphipod (*Gammarus acherondytes*), Decurrent false aster (*Boltonia decurrens*), Mead's milkweed (*Asclepias meadii*), Eastern prairie fringed orchid (*Platanthera leucophaea*), and Running buffalo clover (*Trifolium stolonifereum*).

While the above listed threatened and endangered species may be present at locations within St. Louis County, Missouri and St. Clair County, Illinois, the project area includes only those lands in downtown St. Louis within the existing Memorial boundary and the adjacent central riverfront (see figure 1).

No species are known to be present within the project area. In addition, the urban environment and associated disturbances make it highly unlikely that suitable habitat to support listed species would be available, now or in the future. Additionally, although improvements to the east slopes of the park and the central riverfront would occur within the 100-year floodplain of the Mississippi River, the project must be designed to ensure no rise in the 100-year base flood elevation after improvements are constructed. This would minimize potential for any impacts to listed species which may occur in or near the river.

Based on these considerations, the NPS has concluded that the project would have no effect on listed species, their habitats, or proposed or designated critical. The NPS will provide the U.S. Fish and Wildlife Service a copy of the EA when released, which will provide additional details about the alternatives being considered and their impacts on the human environment. Your input will help ensure that the environmental impacts of the proposal are properly considered.

Thank you and if you have any questions or require any further information please contact me at 314-655-1630.



Thomas A. Bradley

cc: Matt Mangan, Interim Field Supervisor, U.S. Fish and Wildlife Service, Marion Illinois Sub-Office, 8588 Route 148 Marion, Illinois 62959



## United States Department of the Interior

NATIONAL PARK SERVICE  
Jefferson National Expansion Memorial  
11 North Fourth Street  
St. Louis, Missouri 63102-1882

IN REPLY REFER TO:

July 22, 2011

L76(JEFF)  
XD18

### Memorandum

**To:** Charlie Scott, Field Supervisor, Columbia Ecological Services Field Office,  
U.S. Fish & Wildlife Service

**From:** Tom Bradley, Superintendent, Jefferson National Expansion Memorial  
National Park Service

**Subject:** Informal Consultation under the Endangered Species Act—Revitalizing Jefferson  
National Expansion Memorial

The National Park Service (NPS), in accordance with the National Environmental Policy Act, is preparing an Environmental Assessment (EA) to evaluate alternatives for revitalizing Jefferson National Expansion Memorial (the park) in St. Louis, Missouri. As part of the goal of revitalizing the park, this EA will consider the impacts to park resources resulting from implementation of the winning design from the City Arch River 2015 International Design Competition, held in 2010. The proposed action involves physical changes to the park and facilities as a method for improving visitor access and experience, while better integrating the park into downtown St. Louis.

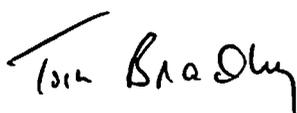
Although specific alternatives have not yet been clearly defined at this stage of the planning process, the major components of the project currently under consideration include:

- a landscaped “lid” over the depressed lanes of Interstate 70 between the Gateway Arch grounds and downtown;
- renovation of the underground museum and a new entrance;
- accessibility improvements and new exhibits in the Old Courthouse;
- development of accessible trails to the riverfront;
- expanded visitor programming and amenities on the Gateway Arch grounds; and
- improvements to the sustainability of the landscape at the park.

According to the U.S. Fish and Wildlife Service’s (USFWS) website, the following listed threatened and endangered species are known to occur in St. Louis County, Missouri: Pink mucket (pearlymussel) (*Lampsilis abrupta*), Scaleshell mussel (*Leptodea leptodon*), Pallid sturgeon (*Scaphirhynchus albus*), Mead's milkweed (*Asclepias meadii*), Decurrent false aster (*Boltonia decurrens*), Running buffalo clover (*Trifolium stoloniferum*), Indiana bat (*Myotis sodalis*), and Gray bat (*Myotis grisescens*).

While the above threatened and endangered species may be present at locations within St. Louis County, the NPS project area includes only those lands in downtown St. Louis within the existing Memorial boundary and does not involve the development of any properties on the east side of the Mississippi River. Prior telephone conversations between NPS staff and U.S. Fish and Wildlife biologists in 2003 indicated that no species were present within the existing Memorial grounds and due to the urban environment and associated disturbances suitable habitat to support the listed species was highly unlikely to be available in the future. At the present time, the Memorial grounds continue to function as a modified urban park environment and it remains highly unlikely that any of the listed species occur within the project area. Therefore, the NPS has concluded that the project is not likely to have an adverse effect on listed species, their habitats, or proposed or designated critical habitat.

Thank you for your review and consideration of this determination. Your input will help ensure that the environmental impacts of the proposal are properly considered. If you have any questions or require any further information please contact me at 314-655-1630.

A handwritten signature in black ink that reads "Tom Bradley". The signature is written in a cursive style with a prominent initial "T" and "B".

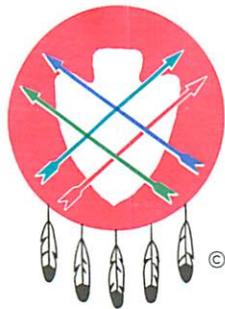
cc:

Joyce Collins, U.S. Fish and Wildlife Service, Marion Illinois Sub-Office, 8588 Route 148  
Marion, Illinois 62959

**APPENDIX C**  
**TRIBAL CONSULTATIONS**



AH 9/7/11



**PEORIA TRIBE OF INDIANS OF OKLAHOMA**

118 S. Eight Tribes Trail (918) 540-2535 FAX (918) 540-2538  
P.O. Box 1527  
MIAMI, OKLAHOMA 74355

CHIEF  
John P. Froman

SECOND CHIEF  
Jason Dollarhide

September 1, 2011

U.S. Department of Interior  
National Park Service  
Attn: Ann Honious  
NEPA Coordinator and Chief of Museum Services  
Jefferson National Expansion Memorial  
11 North Fourth Street  
St. Louis, MO 63102-1882

RE: Jefferson National Expansion Memorial

Thank you for notice of the referenced project. The Peoria Tribe of Indians of Oklahoma is interested in consulting on the project. Please include us on all mailing lists pertaining to this site. Please share all information concerning this project as it pertains to Native American interests.  
Contact information is:

Frank Hecksher  
Special Projects/NAGPRA Manager  
118 S. Eight Tribes Trail  
Miami, OK 74354  
918-540-2535  
fhecksher@peoriatribes.com

John P. Froman  
Chief

TREASURER  
John Sharp

SECRETARY  
Don Giles

FIRST COUNCILMAN  
Carolyn Ritchey

SECOND COUNCILMAN  
Jenny Rampey

THIRD COUNCILMAN  
Alan Goforth



Tom / AH  
Fraake / AH  
Ann AH 9.29.11

## TRIBAL HISTORIC PRESERVATION OFFICE

Date: September 23, 2011

File: 1112-24MO-10

RE: NPS Jefferson National Expansion Memorial (Gateway Arch) Implementation of the Winning Design of the Framing a Modern Masterpiece International Design Competition

Jefferson National Expansion Memorial  
Thomas A. Bradley  
11 North Fourth Street  
St. Louis, MO 63102-1882

Dear Mr. Bradley,

The Osage Nation Historic Preservation Office has received notification and accompanying information for the proposed project listed as NPS Jefferson National Expansion Memorial (Gateway Arch) Implementation of the Winning Design of the Framing a Modern Masterpiece International Design Competition. **The Osage Nation requests a copy of the Environmental Assessment.**

In accordance with the National Historic Preservation Act, (NHPA) [16 U.S.C. 470 §§ 470-470w-6] 1966, undertakings subject to the review process are referred to in S101 (d)(6)(A), which clarifies that historic properties may have religious and cultural significance to Indian tribes. Additionally, Section 106 of NHPA requires Federal agencies to consider the effects of their actions on historic properties (36 CFR Part 800) as does the National Environmental Policy Act (43 U.S.C. 4321 and 4331-35 and 40 CFR 1501.7(a) of 1969).

The Osage Nation has a vital interest in protecting its historic and ancestral cultural resources. **The Osage Nation anticipates reviewing and commenting on the planned Environmental Assessment for the proposed NPS Jefferson National Expansion Memorial (Gateway Arch) Implementation of the Winning Design of the Framing a Modern Masterpiece International Design Competition.**

Should you have any questions or need any additional information please feel free to contact me at the number listed below. Thank you for consulting with the Osage Nation on this matter.

James Munkres  
Archaeologist I

**APPENDIX D**  
**PROGRAMMATIC AGREEMENT**



**PROGRAMMATIC AGREEMENT  
AMONG  
THE UNITED STATES DEPARTMENT OF THE INTERIOR (NATIONAL PARK SERVICE),  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND  
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER  
REGARDING  
IMPLEMENTATION OF THE WINNING DESIGN OF THE FRAMING A MODERN  
MASTERPIECE INTERNATIONAL DESIGN COMPETITON**

**WHEREAS**, the United States Department of the Interior, National Park Service, Jefferson National Expansion Memorial (NPS) and the CityArchRiver 2015 Foundation (Foundation) propose to implement the winning design of the *Framing a Modern Masterpiece* International Design Competition (the Design Competition) by carrying out the physical and programmatic elements called for by that design in Appendix A (the Undertaking) and in doing so must meet the requirements of Sections 106 and 110(f) of the National Historic Preservation Act (16 U.S.C. 470f, 470h-2(f)); and

**WHEREAS**, the Design Competition was undertaken after being identified as the preferred alternative of the October 2009 General Management Plan/Environmental Impact Statement (GMP/EIS) for Jefferson National Expansion Memorial (the Park); and

**WHEREAS**, the Foundation sponsored the Design Competition focusing on the Park, a National Historic Landmark (NHL), to result in the selection of a design “to integrate the park, the east and west sides of the Mississippi River, the surrounding attractions and the downtown into a single and vibrant dynamic destination;” and

**WHEREAS**, the Federal Highway Administration (FHWA) has satisfied the requirements of Section 106 for transportation improvements associated with the Foundation’s Design Competition (see Appendix A) including the proposed construction of a 300-foot wide landscaped ‘lid’ over the sunken lanes of I-70 between Market and Chestnut streets and associated road and ramp changes as demonstrated by a concurrence by the Missouri SHPO dated September 30, 2011 with FHWA’s finding of a no adverse effect; and

**WHEREAS**, the NPS has identified the Area of Potential Effect (APE) and assembled a list of historic properties within the APE that have the potential to be affected by the Undertaking as indicated in Appendix B; and

**WHEREAS**, NPS has determined that effects on historic properties cannot be fully evaluated prior to approval of the undertaking, and has developed this Programmatic Agreement (PA) establishing a process to assess and resolve adverse effects in accordance with 36 CFR Part 800.14(b)(1)(ii); and

**WHEREAS**, the Secretary of the Interior has been invited to participate in recognition of the potential effects to two National Historic Landmarks (Jefferson National Expansion Memorial and Eads Bridge); and

**WHEREAS**, any portion of the winning design that extended beyond the referenced APE will not be implemented under this PA, except as noted herein or as amended pursuant to the terms herein; and

**WHEREAS**, the NPS acknowledges that removal of parking will create a demand for parking accommodation beyond the confines of the Park, and the connection to this Undertaking, if any, will be clarified and NPS agrees to undertake separate review of that action under 36 CFR Part 800, as appropriate; before the removal of the parking garage will commence; and

**WHEREAS**, the NPS, consulted with the Advisory Council on Historic Preservation (ACHP) and the ACHP will be a signatory to this PA; and

**WHEREAS**, the development and execution of this PA fulfills stipulation IV.H of the Memorandum of Agreement among the NPS, ACHP, Illinois and Missouri SHPOs and the Foundation executed July 13, 2010 to guide the design completion; and

**WHEREAS**, the NPS consulted with the Missouri and Illinois State Historic Preservation Officers (SHPO) and the Illinois SHPO declined to participate in negotiations to develop the PA or be a signatory to the PA; and

**WHEREAS**, the NPS consulted with the Absentee-Shawnee Tribe of Indians of Oklahoma, Delaware Nation of Oklahoma, Eastern Shawnee Tribe of Oklahoma, Iowa Tribe of Kansas and Nebraska, Iowa Tribe of Oklahoma, Kaw Nation, Kickapoo Tribe in Kansas, Miami Tribe of Oklahoma, Muscogee Creek Nation, Osage Nation, Ponca Tribe of Nebraska, Peoria Tribe of Oklahoma, Quapaw Tribe of Oklahoma, Sac and Fox Tribe of the Missouri in Kansas and Nebraska, Sac and Fox Tribe of the Mississippi in Iowa, Sac and Fox Nation of Oklahoma concerning the Undertaking and historic properties of cultural significance to them; and

**WHEREAS**, the Peoria Tribe of Oklahoma, Miami Tribe of Oklahoma, and Quapaw Tribe of Oklahoma (here after referred to as "other Interested Tribes") desire to continue participating in consultations and have been invited to sign the agreement as a Concurring Party (acknowledging that the Tribes have read and understand the PA and are in agreement with the terms of the PA); and

**WHEREAS**, the Osage Nation desires to continue participating in consultations and has been invited to execute this agreement; and

**WHEREAS**, the NPS has and continues to provide the public with information about the Undertaking and shall continue to seek and consider the views of the public regarding the Undertaking; and

**WHEREAS**, Missouri Preservation has participated in consultations and has been invited to sign this agreement as a Concurring Party; and

**WHEREAS**, the National Trust for Historic Preservation has participated in consultations and has been invited to sign this agreement as a Concurring Party;

**NOW, THEREFORE**, the NPS, the ACHP, and the Missouri SHPO agree that the Undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the Undertaking on historic properties.

## **STIPULATIONS**

Consistent with assurances contained in the GMP/EIS for the Park, the National Park Service will *not allow the implementation of a project that would cause impairment to the Memorial, and all of the enhancements would be required to be located in such a manner as to preserve the integrity of the National Historic Landmark and National Register Historic District.* In furtherance of this assurance, the National Park Service will ensure that the following measures are carried out.

### **I. APPLICABILITY AND SCOPE**

This PA applies to the design and construction of the Undertaking defined in Appendix A. The NPS is the lead federal agency for fulfilling the Section 106 requirements in accordance with this PA.

### **II. PROFESSIONAL QUALIFICATIONS AND STANDARDS**

A. The NPS will ensure that all work performed on the Site that has the potential to have an effect, directly or indirectly, on contributing structures and/or landscape features is performed or supervised by qualified individuals and/or teams that meet the *Secretary of the Interior's Historic Preservation Professional Qualification Standards*, 62 Fed. Reg. 33,707 (June 20, 1997), for history, architectural history, architecture, historic architecture and conservation, landscape architecture and/or archeology, as appropriate. Nothing in this stipulation may be interpreted to preclude NPS or any agent or contractor thereof from using the properly supervised services of persons who do not meet the professional qualification standards.

B. Any testing, inventory or documentation of potential or known historic properties pursuant to implementation of the PA shall conform to the provisions of the Secretary of the Interior's *Standards and*

*Guidelines for Archeology and Historic Preservation* (48 FR. 44716-44740) and applicable standards and guidelines for historic preservation established by the Missouri SHPO.

### III. IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES

A. **Historic Structures, Buildings, Objects and Landscapes.** Through its management of the Park, the NPS has compiled extensive documentation on the presence and significance of historic properties as documented on the park's CAR2015 Design Center web site at <http://www.nps.gov/jeff/parkmgmt/cardocuments.htm>. This documentation includes analysis of the existing contributing features and contributing landscape features of the Memorial and identification of known historic properties and their qualifying characteristics within the APE (Appendix B). NPS will ensure that this documentation is fully taken into account. Additionally, NPS will ensure that this documentation is available to all consulting parties and the public except for sensitive archeological documentation, which may be kept private in accordance with stipulation III.F below. In carrying out the components of the Undertaking identified in Appendix A, the NPS will not need to undertake any additional studies to identify at grade historic properties, unless otherwise set forth in this PA.

B. **Archeological Resources - Identification.** Implementation of the Undertaking may result in damage to previously unknown archeological resources. Accordingly, the NPS will consult with the Missouri SHPO and Osage Nation and carry out needed archeological surveys to determine if any such archeological sites are present and whether such sites are eligible for inclusion in the National Register. Although NPS files indicate that large amounts of sediments were imported from another location during monument landscape construction, the source and degree of integrity at specific locations within the park is currently unknown. Before any ground disturbing activities take place, all locations that may be impacted by these activities will be tested and evaluated for potential to contribute archeological information during the course of each project component. The NPS will conduct identification and assessment of archeological resources consistent with the following measures.

1. *Survey Scope.* The NPS, in consultation with the Missouri SHPO and the Osage Nation, will identify all surface areas that may be altered in any way by construction activities, to include any areas subject to temporary disturbance due to construction activities, lay-down areas, access roads, etc. An archeological identification effort will be carried out for these areas with the exception of any areas for which sufficient archeological information is already known or there is clear evidence that an area has been disturbed by previous activity to the extent that the presence of significant archeological deposits is highly unlikely.
2. *Survey Timing.* The NPS will schedule survey activities to reflect the sequential nature of construction activities and to ensure that survey activities and consultation on the identification, effects, and resolution of any adverse effects are completed well in advance of any construction related soil disturbance activities.
3. *Survey Methodology.* The NPS will consult with the Missouri SHPO and the Osage Nation and develop an efficient and effective survey methodology, ensuring that it is sufficient to generate information necessary to apply the National Register Criteria to any identified sites. The NPS shall ensure that the determinations of eligibility are consistent with the National Register Bulletin: *How to Apply the National Register Criteria for Evaluation* and follow the format consistent with the *State of Missouri, Department of the Natural Resources, Preliminary National Register of Historic Places Eligibility Assessment* (<http://www.dnr.mo.gov/forms/780-1878-f.pdf>) or another format mutually agreed upon by the NPS and Missouri SHPO.
4. *Outcome.* Based on its analysis of survey results and further consultation with appropriate signatories to this PA, NPS will apply the National Register Criteria and determine what, if any, identified archeological sites are eligible for inclusion in the National Register.

C. **Archeological Resources – Treatment.** For identified archeological properties determined to be eligible for the National Register, the NPS, in consultation with the Missouri SHPO and the Osage Nation, will develop treatment measures. Priority will be given to avoidance alternatives, to include burying sites under fill or incorporating them into the Undertaking, provided that the long-term protection of the archeological site can be assured by such measures. If avoidance options are not practical, NPS will undertake a data recovery plan for the recovery of archeological data from the site. Archeological

treatment plans and/or data recovery plans will be developed during the Design Development phase of design once options to avoid sites have been explored. Data recovery will be guided by a scope of work that includes:

1. Research questions to be addressed through the data recovery or through other research means.
2. Methods to be used, with an explanation of their relevance to the research questions.
3. Methods to be used in the analysis, data management, and dissemination of data, including a schedule.
4. Proposed disposition of recovered materials and records. And,
5. Proposed methods for involving the public and disseminating results of the work to the public.

The NPS will ensure that the data recovery plan is carried out and the signatories to the PA notified of the results.

**D. Consultation Protocols.** In carrying out the measures set forth in stipulation V. B, the NPS will ensure that consultation with the Missouri SHPO and the Osage Nation is conducted in a manner in which:

1. Meaningful input and opportunity for resolving disagreements is encouraged;
2. Any reviewing party for any scopes of work, National Register evaluations, treatment plans, and data recovery plans is provided 30 calendar days from the time of receipt to conduct review and submit comments unless otherwise negotiated; and,
3. Comments received are taken fully into account and the commenting party is notified of how the NPS responded to its comments.

**E. Review Materials.** At a minimum, the Missouri SHPO and the Osage Nation will be provided with the following items for their information and/or review:

1. Scopes of work and/or survey methodologies;
2. Draft and final archeological reports and memorandums at each stage of archeological investigation;
3. Archeological treatment and/or data recovery plans; and,
4. Responses to comments.

**F. Site Disclosure.** All archeological resources identified in carrying out the terms of this PA are subject to the provisions of section 304 of the National Historic Preservation Act, relating to the disclosure of archeological site information and NPS will ensure that all actions and documentation prescribed by this PA are consistent with said sections.

#### **IV. OUTREACH TO AND INVOLVEMENT OF TRIBES**

A. The NPS is committed to working with the Osage Nation and other Interested Tribes to assist in identifying and minimizing project impacts on important cultural resources, graves, and isolated human remains and recognizes that tribal monitoring is a vital contributing element in this effort.

B. Other Interested Tribes, as identified in the whereas clause of this PA, will receive all notifications and review materials stipulated in this PA for informational purposes.

C. Tribal monitoring will follow protocols and procedures established through consultation as set forth in Appendix C.

**D. Unanticipated Discovery of Human Remains or Graves.**

1. In the case of an unanticipated discovery of human remains or graves on Federal land, the NPS shall follow the procedures outlined by the Native American Graves Protection and Repatriation Act, as amended (43 C.F.R. 10, Subpart B), and pursuant to the Archeological Resources Protection Act of 1979 (43 C.F.R. 7) and as clarified in Appendix D.
2. If remains are found not to be Native American and not associated with a crime scene, every effort will be made to avoid impacting burial areas and graves. NPS will attempt to consult with individuals and groups linked by demonstrable ties of kinship or culture to potentially identifiable human remains. Reinterment at the same park may be permitted or another agreement reached

as to their treatment. If no consulting groups are identified, NPS will consult with the Missouri SHPO to determine an appropriate course of action.

## V. DESIGN DEVELOPMENT

The Undertaking will be designed consistent with design objectives expressed in the outcome of the winning design. Implementation of the design and development of design documents and specifications for the various component parts of the Undertaking will present overlapping and demanding schedules to meet construction schedules. To accommodate these factors while ensuring that there is adequate opportunity for input from consulting parties, NPS will implement the following measures.

A. **Design Standards.** The NPS and Foundation will ensure that all design contractors working on the Undertaking are provided design standards, to include at a minimum, the following:

1. The Secretary of the Interior's *Standards for the Rehabilitation of Cultural Landscapes*.
2. The Secretary of the Interior's *Standards for the Treatment of Historic Properties*.
3. Formatting and content consistent with the NPS Denver Service Center Design Workflows guidelines for schematic, design, and construction documents <http://www.nps.gov/dscw/designbidbuild.htm>.
4. A copy of this executed PA. And,
5. Other design standards recommended by signatories to this PA as deemed appropriate by the NPS and Foundation.

The NPS and the Foundation will ensure that the design contractors adhere to these standards in the development of all design documents including change orders necessitated after award of any construction contracts implementing the Undertaking or part thereof.

B. **Establishment of Collaborative Design Review Team.** To ensure that signatories and consulting parties to this PA have opportunity to assist the NPS in meeting its design goal that the Undertaking preserve the integrity of this historic setting, the NPS, with assistance from the Foundation, will establish and provide administrative support to a Collaborative Design Review Team.

1. *Membership.* Membership on the team will consist of a representative of the NPS, the Foundation, the Missouri SHPO, and Missouri Preservation. Additional members would be added to this team at the discretion of its members and based on the nature of the particular component of the Undertaking being reviewed. Consulting parties wishing to participate in design review of specific components of the Undertaking will let their interest be known by notification to the NPS. The NPS shall notify the National Trust for Historic Preservation as early as possible in advance of all Collaborative Design Review Team meetings to help ensure that it has an opportunity to request participation by joining the meeting.
2. *Team Mission.* The primary purpose of the team will be to review draft schematic and design documents and evaluate how project design and specifications may affect qualifying characteristics of properties included in or eligible for inclusion in the National Register and to make recommendations on how relationships between the design and historic properties might be improved and/or adverse effects avoided.
3. *Team Support.* The NPS, with assistance from the Foundation, will facilitate the function of this Team by providing for regularly scheduled meetings during the design process, ensuring that Team members are provided all appropriate construction documents in a timely fashion, and documenting the outcome of team meetings. At its initial meetings, the Collaborative Design Review Team will establish its general operating procedures and the NPS will ensure that these procedures are distributed consistent with stipulation V.B.4. below.
4. *Consulting Party and Public Notification of Team Activities.* Through use of appropriate websites or other notification techniques, the NPS will ensure that consulting parties and the public are provided information about the purposes of the Collaborative Design Review Team and its general schedule of activities, along with the schedule of design review process for the Undertaking as it may relate to the activities of the Collaborative Design Review Team. Upon

request, the NPS, on behalf of the Collaborative Design Review Team, will respond to consulting party and/or the public inquiries about how comments were taken into account in the decision making process.

5. *Team Outcome and Dispute Resolution.* The members of the Team will strive diligently to work toward mutually agreeable outcomes on design issues addressed by the Team. If, during the course of Team review of a design proposal an impasse is reached, any member of the Team can take steps to have the dispute resolved through the provisions set forth in stipulation X of this PA.
6. *Team Duration.* The Team will remain in place until the close of the design process, to include development of pertinent design construction documents and specifications, for the components of the Undertaking or sooner if mutually agreed to by all of the Team members.

## **VI. PUBLIC OUTREACH**

Until such time as the Undertaking is completed, the NPS, with assistance from the Foundation, will take necessary steps to ensure that the public is provided timely information on the status of the Undertaking and steps taken to meet the terms of the PA. At a minimum, these efforts will include use of relevant websites to update the public and solicit ongoing input and suggestions as it may relate to the relationship of the Undertaking to historic properties. Information to be exchanged with the public will include project design and construction schedules, the activities of the Collaborative Design Review Team, as discussed in stipulation V.B.4, the results of further historic property identification efforts, as discussed in stipulation III.A, new interpretive features, and component design plans. Throughout this outreach effort, the NPS will encourage input from the consulting parties to this PA and other groups, organizations, and individuals that did not participate in consultation leading to this PA.

## **VII. DOCUMENTATION**

A. The NPS shall prepare Historic American Landscape Survey (HALS) recordation of the NHL prior to alterations in the Design Competition's rehabilitation of or introduction of new features into the historic landscape. HALS documentation will be completed prior to the commencement of any construction activities.

B. Following implementation of the Undertaking the NPS shall update the NHL documentation to reflect modifications that resulted from the Undertaking, and to include more information about the significance of the historic landscape to the overall NHL designation.

## **VIII. INADVERTANT DISCOVERIES AND UNANTICIPATED EFFECTS**

In the event that previously unreported and unanticipated historic properties or unanticipated effects to already known historic properties are found during activities conducted by or on behalf of the NPS, the NPS will ensure that the procedures set forth in Appendix E are fully carried out.

## **IX. INTERPRETIVE TREATMENTS**

A. The NPS will seek to interpret for future visitors to the Jefferson National Expansion Memorial the changes that have occurred at the Park as a consequence of the Design Competition and implementation of the Undertaking. The NPS will consider a wide range of options for how best to achieve this interpretive program, including a permanent exhibit within the Museum, explaining the Design Competition and resulting changes to the appearance and character of the JNEM, using models, documents, etc. from the Competition and/or other electronic media, waysides or exhibits.

B. In the development of this interpretive program the NPS will consult with the signatories to this PA and examine possible techniques and interpretive techniques that will provide visitors with information on historic properties known to have existed prior to construction of the Arch and Grounds and archeological features preserved in place in carrying out the Undertaking unless pursuant to stipulation III.F. above the nature and location of a remaining archeological site(s) should be kept confidential.

## **X. DISPUTE RESOLUTION**

A. Should the signatories executing this PA at any time object in writing to the manner in which the terms of this PA are implemented, to any action carried out or proposed with respect to implementation of this

PA, or to any document prepared in accordance with and subject to the terms of this PA, the objecting party shall notify the other signatories, and the signatories shall consult within seven calendar days to resolve the objection.

B. If the objection is resolved through consultation, the NPS may proceed with the disputed action in accordance with the terms of such resolution.

C. If, after initiating consultation, the NPS determines that the objection cannot be resolved through consultation, or if the duration of the consultation has exceeded 15 days from the commencement of consultation to resolve the dispute, the NPS shall forward all documentation relevant to the objection to the ACHP, including the NPS's proposed resolution of the objection, with the expectation that the ACHP shall within 30 days after receipt of such documentation:

1. Advise the NPS that the ACHP concurs in the NPS's proposed resolution of the objection, whereupon the NPS shall notify the signatories executing this PA, and NPS shall resolve the objection accordingly; or
2. Provide the NPS with recommendations, which the NPS shall take into account in reaching a final decision to resolve the objection. The NPS shall notify the signatories executing this PA of its final decision.

D. The procedures outlined in stipulations X.A to X.C, above, shall apply only to the subject of the objection. The NPS's responsibility to carry out all actions under this PA that are not the subjects of the objection, and which do not foreclose the consideration of alternatives to resolve the objection, shall remain unchanged.

## **XI. ADMINISTRATIVE PROVISIONS**

**A. Amendments.** Any signatory executing this PA may propose that this PA be amended, whereupon the NPS and other executing signatories shall consult to consider such amendment. This PA may be amended only upon the written agreement of the executing signatories. The amendment shall be effective on the date a copy signed by all of the signatories is filed with the ACHP by the NPS.

**B. Termination.** If any signatory executing this PA proposes termination of the PA, the party proposing termination shall, in writing, notify the other signatories executing this PA, explain the reasons for proposing termination, and consult to seek alternatives to termination. Should such consultation fail, the signatory proposing termination may terminate this PA by promptly notifying in writing the other executing signatories. Termination shall render this PA without further force or effect. Should this PA be terminated, the NPS shall consult regarding the Undertaking with the executing signatories in accordance with 36 CFR Part 800.

**C. Duration of the PA.** Unless terminated pursuant to stipulation XI.B, the duration of this PA is five years from the date of its execution. NPS may initiate consultation with the signatories executing this PA approximately one (1) year prior to the expiration date of this PA to reconsider its terms. Reconsideration may include the continuation or revision of this PA by amendment or termination.

**D. Effective date of the PA.** This PA shall take effect on the date that it has been signed by the last executing signatory.

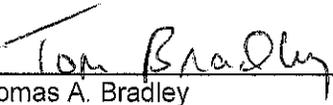
**E. Anti-deficiency Act.** Any requirement for the payment or obligation of funds by the Government established by the terms of this PA shall be subject to availability of appropriated funds. No provision in this PA shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 USC Section 1341. If the availability of funds and compliance with the Anti-Deficiency Act impair the NPS' ability to perform under this PA, then the NPS shall consult in accordance with stipulation XI.B of this PA.

Execution of this PA and implementation of its terms evidence that the NPS has taken into account the effects of this Undertaking on historic properties and has afforded the ACHP an opportunity to comment on the Undertaking and its effect on historic properties.

PROGRAMMATIC AGREEMENT  
AMONG  
THE UNITED STATES DEPARTMENT OF THE INTERIOR (NATIONAL PARK SERVICE),  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND  
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER  
REGARDING  
IMPLEMENTATION OF THE WINNING DESIGN OF THE FRAMING A MODERN  
MASTERPIECE INTERNATIONAL DESIGN COMPETITON

SIGNATORY

NATIONAL PARK SERVICE

  
\_\_\_\_\_  
Thomas A. Bradley

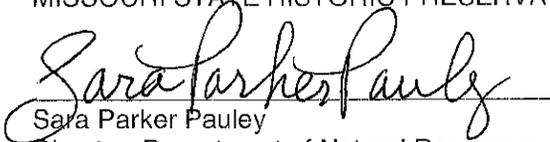
Superintendent, Jefferson National Expansion Memorial

Date: 9/18/12

PROGRAMMATIC AGREEMENT  
AMONG  
THE UNITED STATES DEPARTMENT OF THE INTERIOR (NATIONAL PARK SERVICE),  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND  
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER  
REGARDING  
IMPLEMENTATION OF THE WINNING DESIGN OF THE FRAMING A MODERN  
MASTERPIECE INTERNATIONAL DESIGN COMPETITON

SIGNATORY

MISSOURI STATE HISTORIC PRESERVATION OFFICER

  
Sara Parker Pauley

Date: 10/26/12

Director, Department of Natural Resources and State Historic Preservation Officer

**SIGNATORIES**

NATIONAL PARK SERVICE

\_\_\_\_\_  
Thomas A. Bradley  
Superintendent, Jefferson National Expansion Memorial

Date: \_\_\_\_\_

MISSOURI STATE HISTORIC PRESERVATION OFFICER

\_\_\_\_\_  
Sara Parker Pauley  
Director, Department of Natural Resources and State Historic Preservation Officer

Date: \_\_\_\_\_

ADVISORY COUNCIL ON HISTORIC PRESERVATION

  
\_\_\_\_\_  
John M. Fowler  
Executive Director

Date: 11/15/12

**Invited Signatories:**

OSAGE NATION

\_\_\_\_\_  
John D. Red Eagle  
Principal Chief

Date: \_\_\_\_\_

CITYARCHRIVER 2015 FOUNDATION

\_\_\_\_\_  
Maggie Hales  
Executive Director

Date: \_\_\_\_\_

PROGRAMMATIC AGREEMENT  
AMONG  
THE UNITED STATES DEPARTMENT OF THE INTERIOR (NATIONAL PARK SERVICE),  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND  
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER  
REGARDING  
IMPLEMENTATION OF THE WINNING DESIGN OF THE FRAMING A MODERN  
MASTERPIECE INTERNATIONAL DESIGN COMPETITON

Invited Signatory:

OSAGE NATION

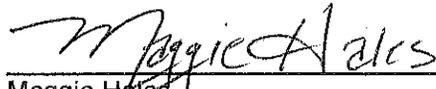
  
\_\_\_\_\_  
John D. Red Eagle  
Principal Chief

Date: 10/19/12

PROGRAMMATIC AGREEMENT  
AMONG  
THE UNITED STATES DEPARTMENT OF THE INTERIOR (NATIONAL PARK SERVICE),  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND  
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER  
REGARDING  
IMPLEMENTATION OF THE WINNING DESIGN OF THE FRAMING A MODERN  
MASTERPIECE INTERNATIONAL DESIGN COMPETITION

Invited Signatory:

CITYARCHRIVER 2015 FOUNDATION

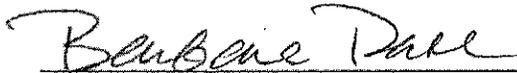
  
\_\_\_\_\_  
Maggie Hales  
Executive Director

Date: 9/18/2012

PROGRAMMATIC AGREEMENT  
AMONG  
THE UNITED STATES DEPARTMENT OF THE INTERIOR (NATIONAL PARK SERVICE),  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND  
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER  
REGARDING  
IMPLEMENTATION OF THE WINNING DESIGN OF THE FRAMING A MODERN  
MASTERPIECE INTERNATIONAL DESIGN COMPETITON

**Concurring Party:**

NATIONAL TRUST FOR HISTORIC PRESERVATION

  
\_\_\_\_\_  
Barbara Pahl  
Vice-President of Western Field Offices

Date: 9-19-12

**Concurring Parties:**

MISSOURI PRESERVATION

\_\_\_\_\_  
Karen Bode Baxter  
President

Date: \_\_\_\_\_

NATIONAL TRUST FOR HISTORIC PRESERVATION

\_\_\_\_\_  
Barbara Pahl  
Vice-President of Western Field Offices

Date: \_\_\_\_\_

PEORIA TRIBE OF OKLAHOMA

\_\_\_\_\_  
John Froman  
Chairman

Date: \_\_\_\_\_

MIAMI TRIBE OF OKLAHOMA

\_\_\_\_\_  
Thomas Gamble  
Chief

Date: \_\_\_\_\_

QUAPAW TRIBE OF OKLAHOMA

\_\_\_\_\_  
John Berrey  
Chairman

Date: \_\_\_\_\_

## APPENDIX A

### THE UNDERTAKING

The overall concept of the Undertaking is informed by the goals established in the Framing a Modern Masterpiece: The City + The Arch + The River competition, as well as extensive stakeholder and public input. The overall design approach of the Undertaking was guided by the 2009 Final Jefferson National Expansion Memorial General Management Plan/Environmental Impact Statement (GMP) and the analysis and treatment recommendations included in the Jefferson National Expansion Memorial Cultural Landscape Report (CLR). The Undertaking includes the following project areas:

- The West Gateway project includes a new park landscape at Luther Ely Smith Square, a new park landscape spanning the depressed lanes of I-70, and new landscaping associated with the Museum of Westward Expansion.
- The Museum of Westward Expansion project renovates existing facilities and exhibits at the visitor center and museum, as well as provides a new universally accessible entrance and lobby facility.
- The North Gateway project includes the removal and replacement of the existing parking garage with an open landscape, and construction of a shared pedestrian/bicycle path between the Arch grounds, city, and riverfront.
- The East Slopes project comprises the east side slopes that surround the railroad open cut walls and tunnels. An accessible connection would be created between the Arch Grounds and the Mississippi riverfront via new pedestrian pathways, and a more sustainable planting strategy will be implemented.
- The Reflecting Ponds project comprises the areas surrounding and including the Reflecting Ponds located between I-70 and the Processional Walks. New, accessible pedestrian pathways through these areas will be created and new planting, grading, and drainage strategies to improve the water quality of the Reflecting Ponds implemented.
- The Processional Walks project area includes the existing system of pedestrian walkways and allées of trees. Existing ash trees, currently threatened by the invasive emerald ash borer, will be replaced with a more suitable but compatible species. The soil, irrigation and drainage network that support the allées will be improved. The walks will be resurfaced or replaced as required with exposed aggregate concrete.
- The Old Courthouse project will renovate selected gallery spaces and develop new exhibits. ADA access improvements will be provided to the first and second floors through ramp and elevator improvements.

Further explanation of the Undertaking's project elements can be found in the environmental assessment prepared for the project which, when completed, will be available on the NPS Planning, Environment and Public Comment web site at <http://parkplanning.nps.gov/projectHome.cfm?projectID=37612> and archived on the park CAR2015 Design Center web site at <http://www.nps.gov/jeff/parkmgmt/cardocuments.htm>.

#### **Design Competition Elements Not Covered by this PA**

Several design elements of the Foundation's Design Competition will be carried out independently of the NPS and with little or no control by the NPS or are largely undefined and thus Section 106 compliance for these elements will not be covered by this PA. Should cumulative impacts associated with these project elements be identified by the Collaborative Design Review Team, the cumulative impacts will be considered during Section 106 review of other project components as designs proceed. These elements are listed below.

#### *Transportation Improvements*

MoDoT has initiated a separate undertaking for transportation needs associated with the Foundation's Design Competition. The MoDoT undertaking is not covered by this PA. It includes the following elements:

- Closure of Memorial Drive northbound between Walnut Street and Washington Avenue and southbound between Chestnut Street and Market Street;

- Construction of a park over the highway spanning the geographically depressed section of I-70 between Market Street and Chestnut Street;
- Changes to ramps on I-70 at Washington Avenue;
- Connection of two sections of Third Street by “punching” through the existing concrete island barrier at the MLK Bridge;
- Connection to downtown from eastbound I-70 at Tucker Boulevard;
- Removal of bridges at Walnut, Market, Chestnut, and Pine Street;
- Construction and reconfiguration of a new Walnut Street bridge ;
- Construction of a new land bridge from Market to Chestnut Street.

#### *Central Riverfront Improvements*

Great Rivers Greenway and the City of St. Louis will undertake improvements along Leonor K. Sullivan Boulevard from Chouteau Avenue to Biddle Street to promote economic development along the riverfront. The project may receive funding from the Federal Transit Authority, Federal Highway Department, and National Park Service. It may need federal permits from the Army Corps or additional federal agencies and will affect land owned by the National Park Service. NEPA compliance for this project will be folded into NEPA compliance for the Design Elements on NPS land. Section 106 will be done separately with the Lead Federal Agency to be determined. Elements of the undertaking may include:

- Raising the elevation of Leonor K. Sullivan Boulevard an average of 2.9 feet across the project site, varying between one foot and 4.5 feet, to reduce the frequency and impact of flood events;
- Establishing a new multi-modal greenway/roadway, providing a critical link in the regional system of bike trails;
- Conversion of the existing two-lane roadway into a narrower two-lane roadway section with a two-way bike path separated from the vehicle travel lanes;
- Establishment of designated areas for bus drop-off/pick-up lanes.

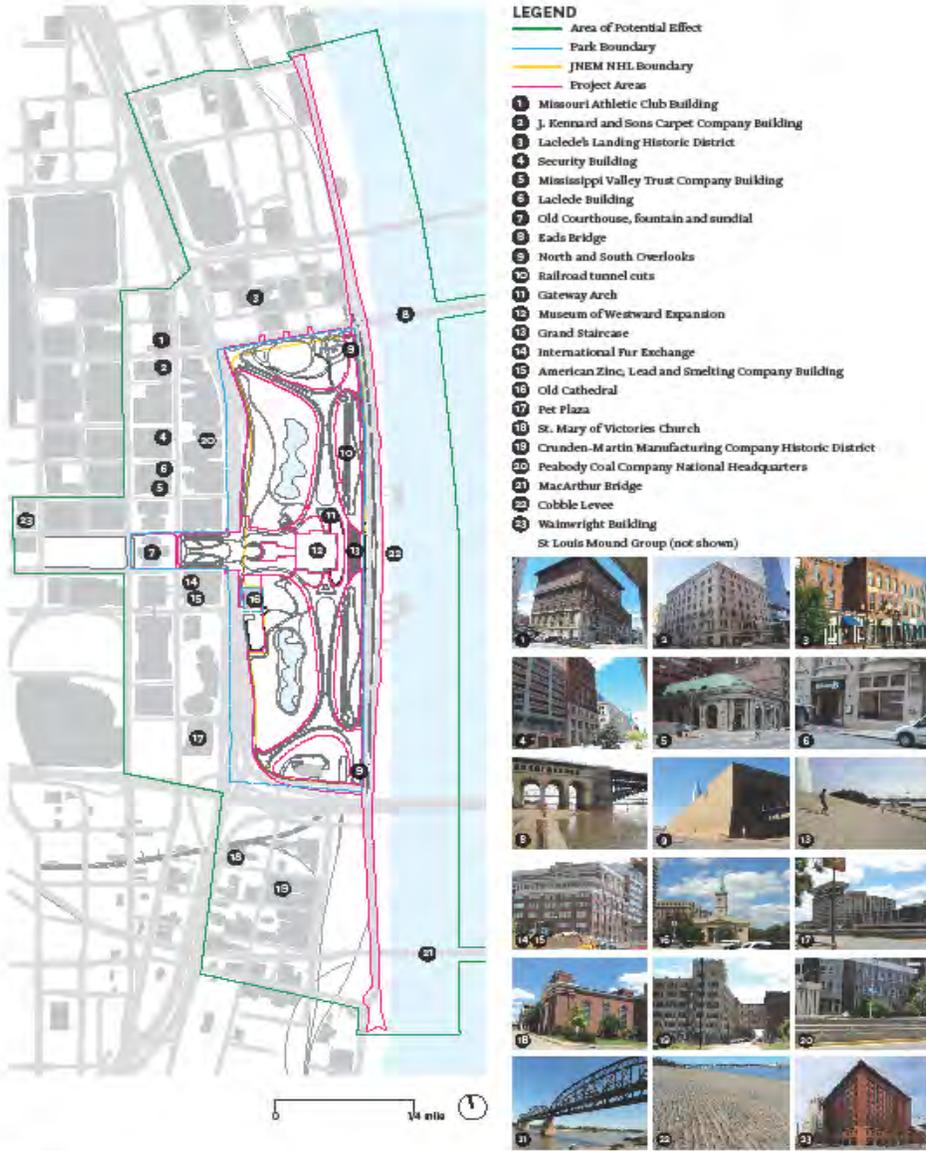
#### *Kiener Plaza Improvements*

Redevelopment of Kiener Plaza will be undertaken by the City of St. Louis using city and private funds. No federal permitting, funding or involvement is expected.

#### *Illinois Design Elements*

The Design Competition called for the development of a park on the Illinois side of the Mississippi River and construction of a gondola to promote connections between the new park and the Memorial. This project would likely involve the National Park Service and other federal permitting and funding agencies. This undertaking is currently relatively undefined. It will be covered under separate compliance if and when it becomes feasible.

# APPENDIX B AREA OF POTENTIAL EFFECTS



2 JULY 2012

**APPENDIX C**  
**TRIBAL MONITORING PLAN**

- A. The NPS is committed to working with the Osage Nation (the Tribe) to assist in identifying and minimizing the Undertaking's impacts on important cultural resources, graves, and isolated human remains.
- B. In general, tribal monitors are hired by the Tribe to monitor areas during the historic property identification and evaluation process and ground disturbing activities related to construction. The NPS will reimburse the Tribe at an agreed upon daily rate. The monitors are required to have adequate training and must follow strict protocols while in the field. The tribal monitors shall be selected by the Tribe. There will be clear lines of communication among the tribal monitors, the Tribe, and the NPS representatives and their consultants and contractors. Reports will be shared with the NPS, other tribes, and other consulting parties that will be identified through the consultation process.
- C. The Osage Nation and interested tribes will be apprised of the scopes of work and scheduling of identification efforts. Pending the results of these initial identification efforts, NPS will consult with the Tribe to determine where tribal monitoring may be necessary and appropriate. Tribal monitoring will be considered in areas where initial identification efforts have indicated that historic properties of importance to the Osage Nation may be affected by the Undertaking.
- D. The objective of the tribal monitoring program is to develop a reasonable monitoring process while minimizing the potential for adverse effects from identification and project activities to historic properties and sites of religious and cultural significance. This plan provides guidelines to assist in the decision-making process when consulting with the Tribe and to implement an effective communication system.
- E. Tribal Monitors Position Description
  - 1. During ground-disturbing activities the tribal monitor will provide assistance with the identification of traditional cultural resources of significance to the Tribe.
  - 2. Tribal monitors may not direct construction personnel or equipment.
  - 3. It is the responsibility of the tribal monitor to actively observe and report any cultural artifact or human remains found either on the surface or subsurface within the project boundaries to the NPS representative.
  - 4. The tribal monitor is required to adhere to the PA and report to the NPS if an archaeological or cultural resource is discovered.
  - 5. Monitors must abide by all safety rules and wear protective equipment at all times while on site.
  - 6. NPS representatives will seek the advice and input of tribal monitors when unanticipated discoveries are encountered.
  - 7. Only if the tribal monitor feels that extremely sensitive materials, such as human remains, are in immediate danger of being damaged or destroyed, they may notify the operator and request that they cease operations in that area until their respective Tribe and the NPS representative can be notified.
- F. Credentials and qualifications of the tribal monitors shall be within the purview of the individual Tribe. The individuals selected will be officially recognized by the Tribe as having the capabilities to perform the duties as described in the job description. The NPS will coordinate the activities of the monitors according to the survey, evaluation, or construction schedule. It is anticipated that the Tribe will administer the activities of the monitors from a tribal perspective. The Osage Nation can also contract out monitoring work to other Native

American Tribes who have qualified staff provided that each tribe officially delegates such authority in writing, stating that they endorse the candidate.

- G. The NPS and the Tribe will agree, through the consultation process, upon the extent of and locations of tribal monitoring. Tribal monitoring will be conducted on areas identified by the Tribe as having significance to that Tribe and areas identified by the Tribe during the Section 106 process.
- H. Tribal monitors will work together with the NPS representative to assist in cultural resource identification and perform monitoring activities in areas targeted for survey, evaluation, or construction. If a cultural resource is discovered, NPS representatives will follow the terms of the PA, as well as all local, state, and federal laws governing the protection and discovery of archaeological and cultural resources. Tribal monitors will communicate with the NPS representative and will not direct construction personnel or equipment. The authority to stop work will rest on the NPS representative except as is outlined in E.7.
- I. It will be the responsibility of the NPS representative to contact, in person, or via email, text, or telephone, the tribal monitor(s) and notify them of emergencies or potential emergencies affecting the entire project areas, such as inclement or violent weather.
- J. The tribal monitor will not remove cultural material unless directly instructed to do so by the NPS representative. Should they be instructed to move the cultural material, they will place the material in an appropriate container and properly label the container to preserve the provenience of the material and deliver it directly to the NPS representative. Transfer of the cultural material to the NPS representative's custody will be documented within a report provided by the monitor or their represented Tribe.
- K. Disputes arising out of this agreement will be resolved in the most efficient manner appropriate to the dispute. If an agreement cannot be reached in this manner, the parties shall engage a mutually agreed-upon mediator. The mediator's decision shall be binding upon the parties. The parties shall share the cost of mediation.

**APPENDIX D**  
**UNANTICIPATED DISCOVERY OF HUMAN REMAINS AND NAGPRA ITEMS**

Procedures for Inadvertent Discoveries of Human Remains, Funerary Objects, Sacred Objects, and Objects of Cultural Patrimony as Defined by 43 CFR Part 10.1(b)(iii)92) During Cultural Resources Investigation Efforts, Construction, and Maintenance:

- A. Any contractor or applicant or their agents, representatives, or employees who knows or has reason to know that he or she has discovered inadvertently human remains, funerary objects, sacred objects, or objects of cultural patrimony must provide immediate telephone notification of the inadvertent discovery, with written confirmation, to the superintendent.
- B. Upon encountering human remains, funerary objects, sacred objects, or items of cultural patrimony during ground disturbing activities, the NPS will ensure that the cultural resource investigator or construction contractor immediately stops work within the ninety (90) meter radius buffer zone around the point of discovery. The NPS will assume responsibility for implementing additional measures, as appropriate, to protect the discovery from looting and vandalism until the requirements of the Native American Graves Protection and Repatriation Act (NAGPRA) have been completed, but must not remove or otherwise disturb any human remains or other items in the immediate vicinity of the discovery.
- C. The NPS will immediately notify law enforcement by telephone of the discovery of unmarked human remains.
- D. The NPS will notify the Osage Nation by telephone and email within forty-eight (48) hours of the discovery of human remains, funerary objects, sacred objects, or items of cultural patrimony. This step is not intended to satisfy the requirements of 43 CFR 10.4(d)(iii).
- E. The NPS will take immediate steps, if necessary, to further secure and protect inadvertently discovered human remains, funerary objects, sacred objects, or items of cultural patrimony, including, as appropriate, stabilization or covering.
- F. Other than for crime scene investigation, no excavation, examination, or analysis of human remains will be conducted without first securing permission from the Osage Nation.
- G. If upon investigation, the local enforcement officer determines that the remains are not involved in a legal investigation, the protocol implementing NAGPRA applies.
- H. The NPS, in consultation with the Osage Nation, will have seven (7) working days to determine if the skeletal remains are human, the degree to which they were disturbed, and, if possible, assess their potential age, cultural affiliation, and identity, if possible, without any further disturbance. Upon making their determination or at the end of the seven (7) days, whichever comes first, the NPS will notify the Osage Nation and other Interested Tribes of its findings. This notification must include pertinent information as to kinds of human remains, funerary objects, sacred objects, or items of cultural patrimony discovered inadvertently, their condition, and the circumstances of their inadvertent discovery. If it is determined that the skeletal remains are not Native American, then the provisions in stipulation IV.D.2. will apply.
- I. The Osage Nation will have seventy-two (72) hours to respond verbally followed by written response via U.S. mail or electronic mail. The response should specify the Osage Nation's intention to conduct or decline further consultation.
- J. The NPS will consult with the Osage Nation or identified lineal descendant regarding additional measures to avoid and protect or mitigate the adverse effect of the project on the human remains and grave site. These measures may include:
  - 1) formal archeological evaluation of the site;
  - 2) visits to the site by the Osage Nation and/or interested Tribes;
  - 3) exploration of potential alternatives to avoid the human remains or grave;

- 4) implementation of a mitigation plan by the NPS in consultation and concurrence with the Osage Nation, including procedures for disinterment and re-interment; and
  - 5) implementation of the mitigation plan.
- K. The NPS or its agents, in consultation with the Osage Nation, Interested Tribes, and other interested parties such as living descendants, may consult with a qualified physical anthropologist, forensic scientist, or other experts as may be needed to examine and assess the inadvertent discovery. Unless the remains were inadvertently removed, the evaluation will be conducted at the site of discovery. The consulting expert will be allowed to draw and measure the exposed remains and associated funerary objects. No photographs or digital images will be permitted. Drawings and other records will be curated at a state-approved curation facility in Missouri. Drawings cannot be published in any form or shown as part of scholarly presentations without the written permission of the Osage Nation or nearest living descendant.
- L. A report of findings describing the background history leading to and immediately following the reporting and resolution of an inadvertent discovery will be prepared within thirty (30) calendar days of the resolution of each inadvertent discovery. This report must meet the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (49 FR 44716) guidelines.

**APPENDIX E**  
**INADVERTENT DISCOVERY OF HISTORIC PROPERTIES**

- A. Objectives: The following procedures shall be used in the event that previously unreported and unanticipated historic properties are found during activities conducted by or on behalf of the NPS.
- B. Pending the results of initial identification and evaluation efforts, NPS will consult with the Missouri SHPO, Osage Nation to determine whether archeological monitoring during construction will be necessary and appropriate. Monitoring will be considered in areas where initial identification and evaluation efforts have indicated that significant historic properties may exist. If deemed necessary, archeological monitors meeting the standards outlined in stipulation II.A. of this PA will be on call to help with the identification and evaluation of historic properties that may be inadvertently discovered during the course of excavation.
- C. The construction contractor must immediately stop all work activity within a ninety (90) meter radius buffer zone, notify the NPS of the discovery, and implement interim measures to protect the discovery from looting and vandalism. Construction may continue outside the buffer zone. Within forty-eight (48) hours of receipt of this notification of the discovery, the NPS shall:
- 1) inspect the work site to determine the extent of the discovery and ensure that work activities have halted within the ninety (90) meter radius buffer zone;
  - 2) clearly mark the area of the discovery;
  - 3) implement additional measures, as appropriate, to protect the discovery from looting and vandalism;
  - 4) notify the Missouri SHPO, Osage Nation of the discovery; and
  - 5) recommend revisions to the construction buffer zone depending upon the nature of the resource discovered.
- D. The NPS, in consultation and concurrence with the Missouri SHPO, and Osage Nation shall have seven (7) business days following notification to determine the National Register of Historic Places eligibility of the discovery. The NPS may assume the newly discovered property to be eligible for the National Register for the purposes of Section 106 pursuant to 36 CFR §800.13(c).
- E. If the find is National Register eligible, the NPS shall consult with the Missouri SHPO and Osage Nation regarding appropriate measures for site treatment pursuant to 36 CFR §800.6(a). The Missouri SHPO, Osage Nation shall have seven (7) business days to provide their objections or concurrence on the proposed actions. Concurrence on the part of the Missouri SHPO and Osage Nation is required for all adverse effect resolution measures. These measures may include:
- 1) formal archeological evaluation of the site;
  - 2) visits to the site by the Missouri SHPO, Osage Nation;
  - 3) exploration of potential alternatives to avoid the site;
  - 4) preparation of a mitigation plan by the NPS in consultation and concurrence with the Osage Nation for approval by the Missouri SHPO; and
  - 5) implementation of a mitigation plan.
- F. If the find is determined to be isolated, discrete, or completely disturbed by construction activities, the NPS shall consult with the Missouri SHPO and Osage Nation prior to resuming construction within the ninety (90) meter radius buffer zone.
- G. The buffer zone radius may be lessened if conditions warrant. Missouri SHPO and Osage Nation, shall have seven (7) business days to comment on the lessening of a buffer zone, but shall be encouraged to respond more quickly in the case of isolated, discrete or completely disturbed resources. In the case of historic resources, the Osage Nation will be notified, but the construction radius may be lessened with just the approval of the Missouri SHPO. In the case of resources with associations to Native American culture, the Osage Nation must also be consulted.



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

