Great Smoky Mountains National Park

U.S. Department of the Interior
National Park Service

Gatlinburg Spur Improvements Environmental Assessment

May 2022

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CHAPTER 1: PURPOSE AND NEED

Introduction

The National Park Service (NPS) is preparing an environmental assessment (EA) to assess the potential effects of improvements along the Gatlinburg Spur (the Spur), a road between Pigeon Forge and the Gatlinburg Bypass in Sevier County, Tennessee. The Spur is part of the Foothills Parkway (Parkway) and Great Smoky Mountains National Park (the Park) in Tennessee.

Purpose of the Action

The purpose of the action is to improve level of service (LOS) in consideration of future traffic volumes along the Spur in a manner that retains the parkway character of the road.

Need for the Action

The proposed project is needed to address high traffic volume, delays, and LOS concerns identified in a recent traffic study (FHWA 2019). The Spur, a segment of US 441/US 321, comprises approximately 4.2 miles of urban parkway; more than 49,000 vehicles use the road daily to travel between Pigeon Forge and Gatlinburg. The Park's popularity has grown in recent years, with the number of visitors increasing 30% from 2010 to 2019 (NPS 2022). Over the same period, the population of Sevier County increased 9.3% to 98,250 people (U.S. Census Bureau 2019). Traffic volumes on the Spur are particularly high during daily peak commuting hours and throughout the Park's peak visitation seasons. The traffic study identified several intersections expected to experience increased congestion, and the Park has identified several corridor-wide improvements to address this congestion.

Project Area

The project area (figures 1 and 2) consists of the approximately 4.2-mile-long Spur corridor between the City of Pigeon Forge to the north and the City of Gatlinburg to the south.

Background

Federal legislation authorizing the Foothills Parkway provided for reconstruction of US 441 from Pigeon Forge to Gatlinburg to create the Spur. As part of the Foothills Parkway, NPS manages the Spur as a limited-access road while retaining its parkway character. Unlike other sections of the Foothills Parkway and other Park roads, commercial vehicle use is allowed on the Spur.

The Spur is a primarily north-south running, four-lane divided roadway. The West Prong of the Little Pigeon River (West Prong) runs between the northbound and southbound lanes, with bridges connecting intersections on either side. The Spur serves local communities/commuters and Park visitors and staff. The roadway also connects to the Gatlinburg Bypass, providing an alternate route to the Park without traveling through downtown Gatlinburg. The corridor serves as a primary route to reach North Carolina to the south and the Knoxville area to the northwest. The Park is one of the most visited NPS units nationwide, with between 10 and 14 million visitors a year since 2014 (NPS 2022). Approximately 70% of visitors enter the Park via the Spur through the downtown Gatlinburg entrance or the Gatlinburg Bypass entrance. Consequently, the Park experience for most visitors begins on the Spur.

In June 2019, the US Department of Transportation – Federal Highway Administration (FHWA) Eastern Federal Lands Highway Division completed the *Traffic Study within the Gatlinburg Spur Corridor of*

Great Smoky Mountains National Park (FHWA 2019). The study analyzed existing and future traffic conditions in the project area considered in this EA, with and without road improvements, focusing on specific intersections or subareas (see figure 2). The study indicated a need to address specific safety issues and traffic congestion by improving LOS at the intersections. Traffic delay is commonly measured through the relationship between traffic volume and roadway capacity expressed through LOS. The LOS designation is a professional industry standard used to describe the measured operating conditions of a roadway segment or intersection. LOS is defined on a scale of A to F that describes the range of operating conditions for a roadway facility. LOS A and B indicate free-flow travel. LOS C indicates stable traffic flow. LOS D indicates the beginning of traffic congestion, and LOS E indicates the nearing of traffic breakdown conditions. LOS F indicates the worst operating conditions where traffic volume is greater than capacity, resulting in congestion. For the purposes of this analysis, LOS D or better is considered acceptable, and LOS E and F are considered unacceptable or intersection failures. A graphic depiction of LOS definitions is provided in appendix A.

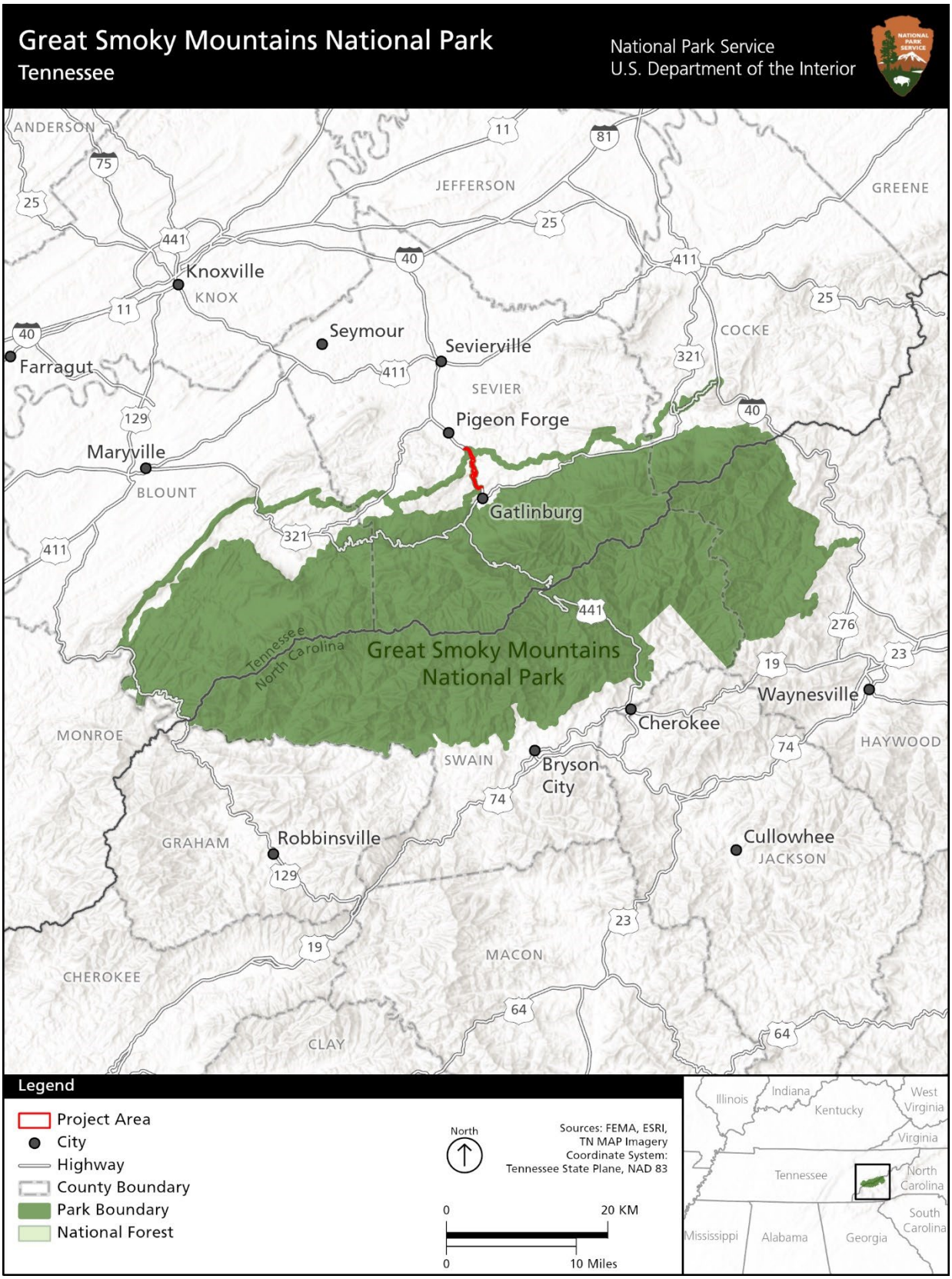

FIGURE 1: PROJECT VICINITY

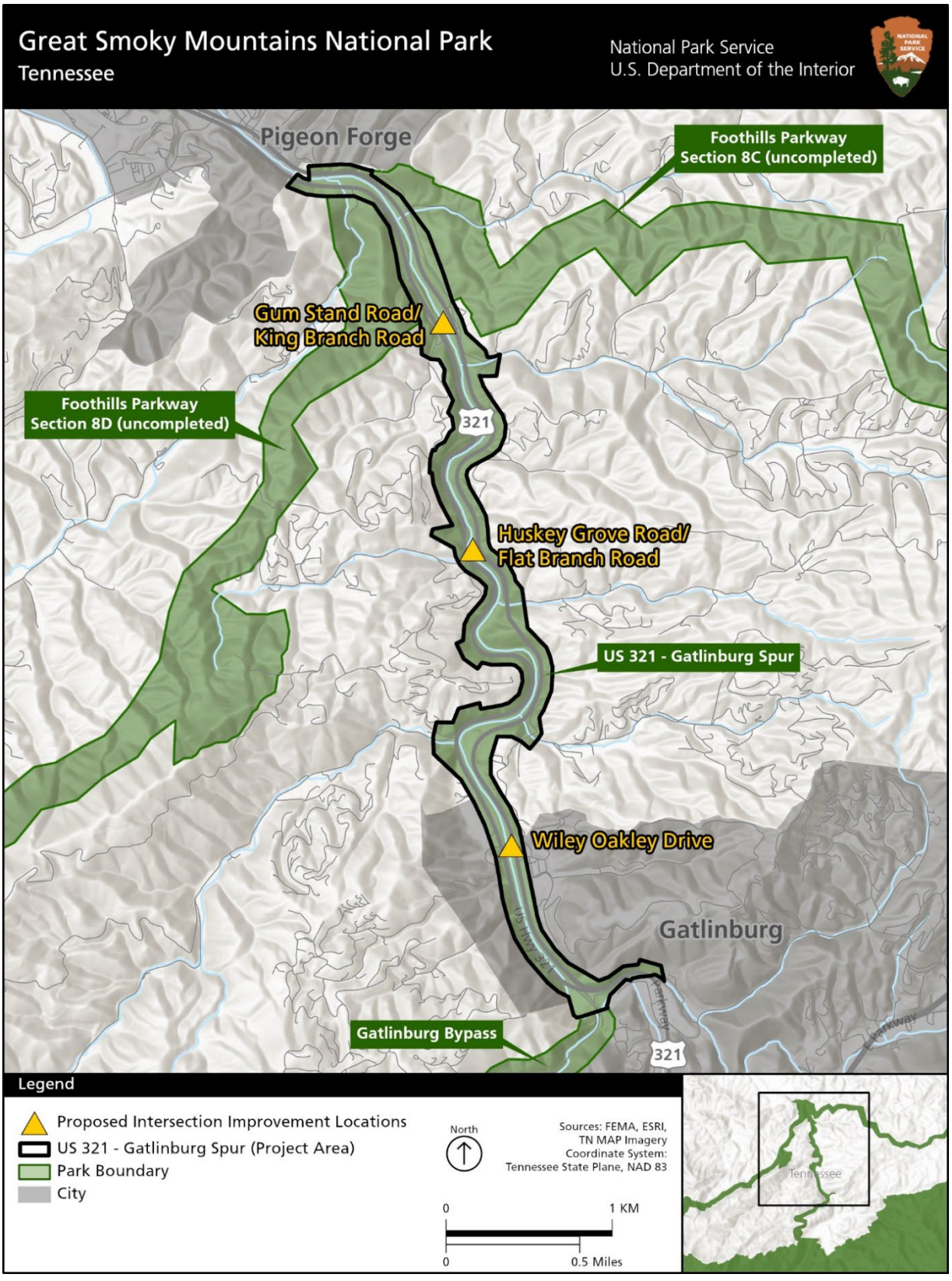

FIGURE 2: PROJECT AREA

CHAPTER 2: ALTERNATIVES

The National Environmental Policy Act (NEPA) requires federal agencies to explore a range of reasonable alternatives aimed at addressing the purpose of and need for a proposed action. Reasonable alternatives include alternatives that are "technically and economically practical or feasible and meet the purpose and need of the proposed action" (43 Code of Federal Regulations [CFR] § 46.420(b)). The alternatives under consideration must include a no action alternative as prescribed by Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR Part 1502.14).

The alternatives analyzed in this document, in accordance with NEPA, consider the feedback from internal (NPS), public, and agency scoping. Alternatives and actions that were considered but are not technically or economically feasible, do not meet the purpose of and need for the project, or conflict with the overall management of the Park or its resources were dismissed from detailed analysis. These alternatives or alternative elements and their reasons for dismissal are discussed at the end of this chapter. Four alternatives are analyzed in this EA: the no action alternative and three action alternatives.

Alternative 1: No Action

CEQ defines the no action alternative as the alternative that represents no change from current management, and the analysis provides a baseline of continuing with the present course of actions. Under the no action alternative, there would be no change to the existing corridor and intersections along the Spur. The Park would continue to implement routine maintenance on the Spur under the no action alternative. Congestion is expected to increase over time. A detailed description of the existing and projected LOS at specific intersections along the Spur is provided in appendix A.

Alternative 2 – NPS Preferred Alternative and Proposed Action

Under alternative 2, NPS would implement corridor-wide improvements and specific improvements at three subareas along the Spur.

CORRIDOR-WIDE IMPROVEMENTS

Corridor-wide improvements would include installation of curb and gutter treatments, shoulder hardening, rockfall mitigation, intelligent transportation systems, and pull-off areas.

Corridor-wide improvements could be implemented where needed along the Spur and are analyzed programmatically within this EA. CEQ defines "programmatic" as any broad or high-level analysis that assesses the environmental impacts of proposed policies, plans, programs, or projects implemented by subsequent actions (CEQ 2014). For corridor-wide actions proposed in this EA, general assumptions are included for the amount and type of disturbance expected along the Spur corridor. If corridor-wide improvements are selected in the Park's decision document and then individually implemented, Park staff would review the EA analysis to confirm the impacts are still consistent with the analysis before proceeding forward to implementation. When appropriate, additional project-specific NEPA reviews would be completed for corridor-wide improvements to supplement the programmatic analysis.

- **Curb and Gutter Treatments**—On some portions of the Spur, vehicles leave the paved areas due to shoulder drop-offs or as an informal shoulder pull-off. Vehicles exiting the road prism create ruts that result in erosion and create maintenance issues. Curb and gutter treatments would be installed in select locations to reduce shoulder drop-off issues and discourage visitors from parking along the roadway shoulder in undesignated locations. Specific locations for curb and gutter treatments could include areas where rutting provides evidence of tires dropping off the edge of the pavement or areas where there is evidence of roadside parking. The programmatic

analysis assumes that up to a maximum of 3,000 total linear feet of curbs and gutters would be installed at individual locations along the Spur. The curb and gutter treatments would be approximately 2.5 feet wide. Total permanent disturbance would be approximately 7,500 square feet (SF) or 0.17 acres. During installation of curb and gutter treatments, up to 45,000 SF or approximately 1 acre could be impacted Spur-wide. All disturbance would occur within the previously disturbed road prism.

- **Shoulder Hardening—**Shoulder hardening could also be used in areas where vehicles leave paved areas and create ruts. In areas where curb and gutter treatments may not be appropriate, approximately 5,000 linear feet of shoulder hardening may be completed. In areas where shoulders are hardened, NPS would include either curbs and gutters or an asphalt shoulder. Hardened shoulders would be paved.
- **Rockfall Mitigation**—The Spur includes several locations of exposed rock in the project area that can cause rockfalls along the roadway. Options for improvements under consideration may include slope stabilization techniques such as scaling loose rock material, installing anchors, and applying shotcrete, as well as rockfall protection measures such as creating rockfall catchment zones on shoulders, installing barriers (including retaining walls) in strategic locations, and altering the vertical or horizontal road alignment away from the catchment zones (FHWA 2011). These actions could occur anywhere exposed rock faces exist along the Spur, up to approximately 5,000 linear feet. Altering the vertical or horizontal road alignment would occur in areas where there is repeated rockfall. The specific rockfall mitigation measure implemented would be tailored to individual locations along the Spur. To help determine the appropriate method, Park staff would reference the guidance provided in the FHWA's *Context Sensitive Rock Slope Design Solutions*. The publication provides guidance for appropriate mitigation selection criteria, including the degree of security or reliability necessary, constructability, service life required, suitability of potential options with respect to the characteristics of the specific rock mass, aesthetics, and cost effectiveness (FHWA 2011).
- **Intelligent Transportation Systems (Speed Monitoring and Wildlife)**—Speeding motorists and bear/vehicle collisions along the Spur are common. In addition to continued enforcement and public education regarding conditions along the Spur, the Park could install a combination variable messaging sign and radar speed sign at approximately 2-mile increments along the Spur (two signs northbound and southbound). Intelligent transportation systems are electronic and could serve the multiple purposes of encouraging drivers to adhere to the speed limit and alerting them that bears commonly cross the road and are at risk of being struck. The signs could either be solar powered or use local electric utilities.
- **Pull-off Areas**—The installation of additional pull-off areas in selected areas would improve emergency vehicle access and provide space for disabled vehicles or motorists to pull safely off the roadway. Pull-off areas would be in locations that are already flat and vegetated with mowed grass that could accommodate 150 to 200-foot-long and 15-foot-wide paved areas. Up to four pull-offs would be installed.

INTERSECTION IMPROVEMENTS

Intersection-specific improvements are proposed for three intersections along the Spur where the existing road geometry and/or LOS result in high levels of congestion or create safety issues. These intersections are described by their individual subareas. The description of the improvements at each intersection are based on best available information and 30% designs completed in support of the EA.

Subarea 1—Gum Stand Road/King Branch Road/Gnatty Branch Road

The first subarea is the Spur's intersection with Gum Stand Road/King Branch Road/Gnatty Branch Road (figure 2). Gum Stand Road is located west of the Spur and provides access to/from the Spur southbound. King Branch Road and Gnatty Branch Road are located east of the Spur with on-ramps to the northbound Spur. A bridge across the river, located between the Spur lanes, provides access to the Spur north from Gum Stand Road and to the Spur south from King Branch Road and Gnatty Branch Road. The location of the bridge creates a difficult pattern for drivers entering and exiting the bridge (e.g., a driver on the bridge attempting to turn north onto the Spur needs to be aware of vehicle traffic traveling northbound, including those drivers turning left in front of them onto the bridge). A similar situation exists in the southbound. Similarly, motorists on the bridge attempting to access Gum Stand, King Branch, or Gnatty Branch Roads are forced to quickly merge across two lanes to depart the Spur.

Under alternative 2, the Park would convert the existing bridge to a contra-flow bridge where vehicles travel to the left of opposing traffic, making left-turn movements to and from the bridge via free-flow movements into an acceleration lane (see figure 3). This design would allow vehicles crossing the bridge to turn left onto the Spur without having to stop or cross oncoming traffic. Vertical separation (including concrete islands or delineators) would be installed along the northbound Spur's acceleration lane between the bridge and King Branch Road/Gnatty Branch Road to prevent vehicles from entering the bridge into the wrong lane. The same separation would occur southbound. Signage would alert motorists to the new bridge pattern. Road striping would also indicate the proper lanes to use. To accommodate larger vehicles' turning radii, the acceleration lanes would also be widened. Two retaining walls, one on the interior of the Spur in each direction, would also be required. These retaining walls would be approximately 775 to 840 feet long and 9 to 10 feet tall. Any retaining walls required under any of the action alternatives would use materials that complement the existing aesthetic of the Parkway.

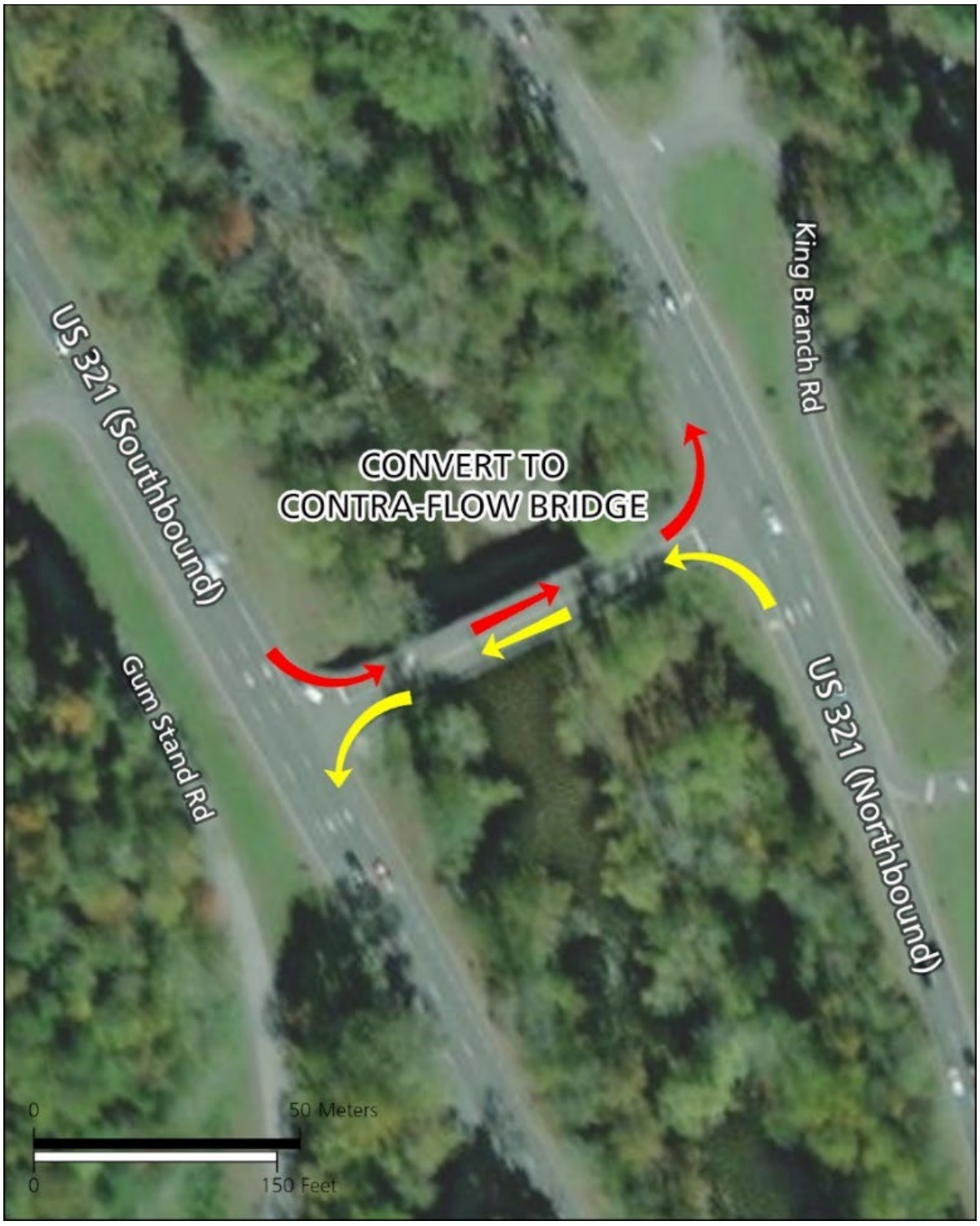

FIGURE 3: ALTERNATIVE 2—SUBAREA 1 PROPOSED CONTRA-FLOW BRIDGE

Subarea 2—Huskey Grove Road / Flat Branch Road

Subarea 2 is located at the intersection of the Spur with Huskey Grove Road and Flat Branch Road (figure 2). Huskey Grove Road travels along a bridge over the West Prong and the southbound Spur. It connects to Flat Branch Road at an intersection 200 feet west of the southbound Spur where an on/off-ramp to the Spur is provided. East of the West Prong, Huskey Grove Road continues south, paralleling the Spur and north to on/off-ramps connecting with the northbound Spur. Existing on-ramps and acceleration lanes at Huskey Grove Road and Flat Branch Road are shorter than required for the speed limit on the Spur. This results in vehicles stopping on the on-ramps, instead of yielding, and creates unsafe traffic conditions.

Under alternative 2, the Park would extend the acceleration lanes along the west side of both the southbound and northbound Spur (figure 4) to allow traffic entering the Spur to yield to oncoming traffic instead of coming to a full stop. Extending the acceleration lanes would allow vehicles additional time to increase their speed to meet the flow of traffic while increasing their line of sight to merge into traffic. Extending the northbound acceleration lane by approximately 820 feet would require 1 acre of disturbance and removal of existing vegetated areas, including grass and several small trees. A retaining wall, approximately 160 feet long and 8 feet tall, would be needed. Extending the southbound acceleration lane by approximately 800 feet would require approximately 1.4 acres of disturbance, including cutting into the rockface to accommodate a 775-foot-long and 25-foot-tall retaining wall adjacent to the roadway. If this alternative is selected for implementation and continues into more detailed design, associated surveys, including geotechnical analysis, may determine that the existing geology is competent to support the vertical cuts, eliminating the need for a retaining wall and reducing the potential disturbance associated with the southbound acceleration lane.

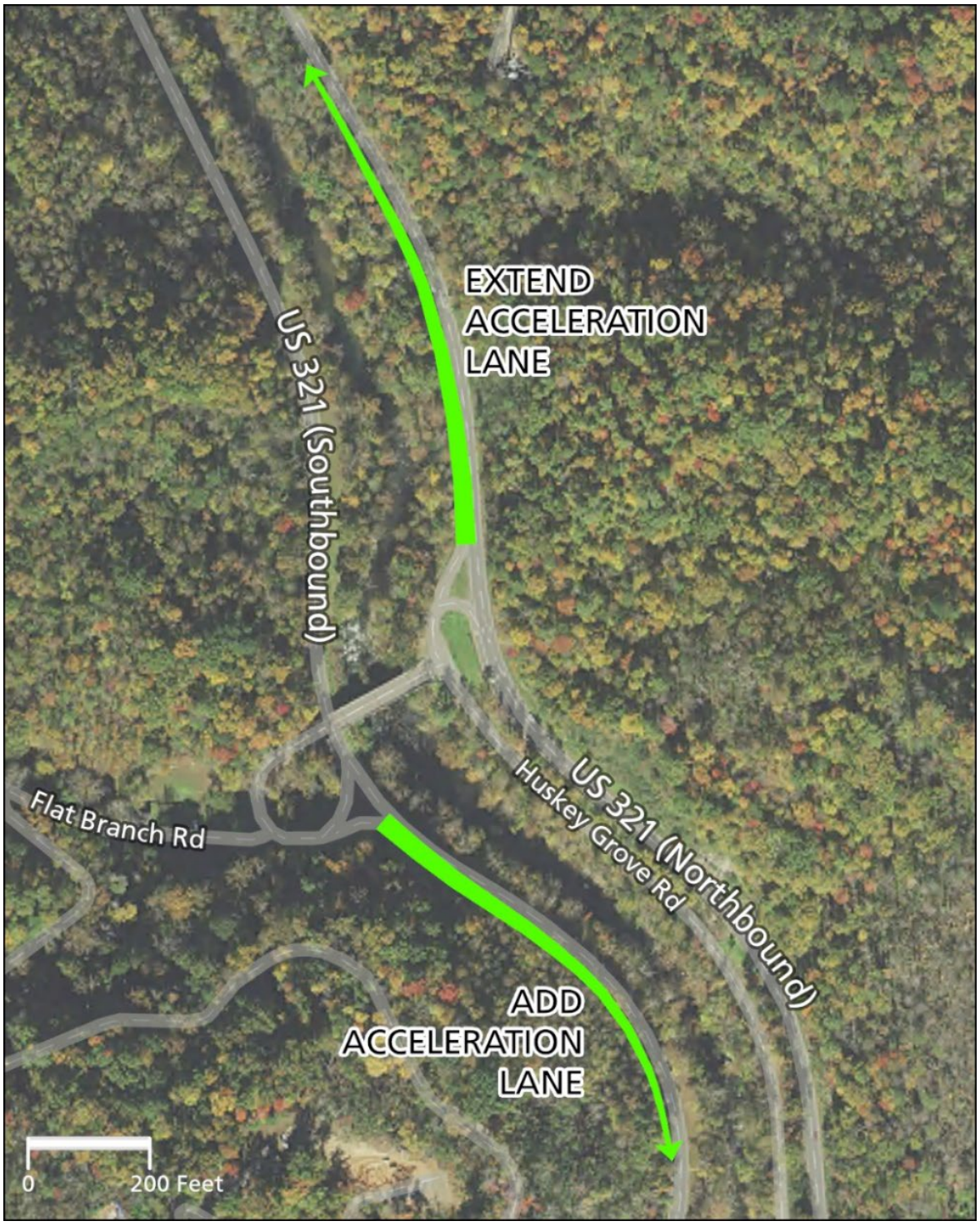

FIGURE 4: ALTERNATIVE 2—SUBAREA 2 PROPOSED ACCELERATION LANES

Subarea 3—Wiley Oakley Drive

Subarea 3 includes the intersection of the Spur with Wiley Oakley Drive, which runs perpendicular to the Spur across West Prong (figure 2). The Gatlinburg Welcome Center is about 200 feet west of this intersection. East of the Spur, the roadway continues as Little Smoky Road and intersects with North Mountain Trail. The Wiley Oakley Drive bridge is heavily used because of the location of the welcome center on one side and a private resort development on the other. Traffic backups on the bridge can be significant for motorists turning left or continuing straight.

Under alternative 2, the Park would construct a flyover bridge to provide a grade-separated interchange to eliminate vehicles crossing both lanes of the Spur, reduce the number of left-hand turn movements, and allow motorists to merge onto the Spur more easily. Figure 5 displays the approximate location of the flyover bridge and alterations to the existing traffic patterns. The flyover bridge would be approximately 450 feet long and would provide at least 16 feet of clearance over the Spur for larger vehicles. A retaining wall, approximately 30 to 40 feet long and 5 to 7 feet tall, would be needed.

The flyover bridge would eliminate turning movements from the Spur mainline in this subarea, and all turns would instead use the flyover bridge with associated acceleration lanes. Under alternative 2, the existing bridge structure would be removed. The existing bridge currently includes local utilities, including a 4-inch gas line, an 8-inch sewer line, and up to an 8-inch water line. The utilities would be relocated under the river using open-trench construction near the existing bridge. The water and sewer lines would be placed approximately 20-feet apart from each other with the gas line between. Open-trench construction would be used to install concrete encased pipes across approximately 75 linear feet of the river crossing. Instream work would be conducted in-the-dry, using coffer dams or a similar solution for temporary water diversion. The total width of the disturbance for all three lines combined would be approximately 45 feet, for a total disturbance of 3,375 SF or 0.08 acres. Directional boring of the river crossing was considered but determined not to be feasible because of the presence of large boulders/aggregate. The existing sewer line is a gravity line that flows from east to west to the sewer plant. As a result of the relocation, the sewer line would also require construction of a new pump station, which would disturb up to 2,500 SF near the intersection of Little Smoky Road and Westgate Resorts Roads adjacent to the northbound Spur. The pump station could be located in or outside the Park boundary; however, NPS prefers to have non-park infrastructure located outside the Park boundary.

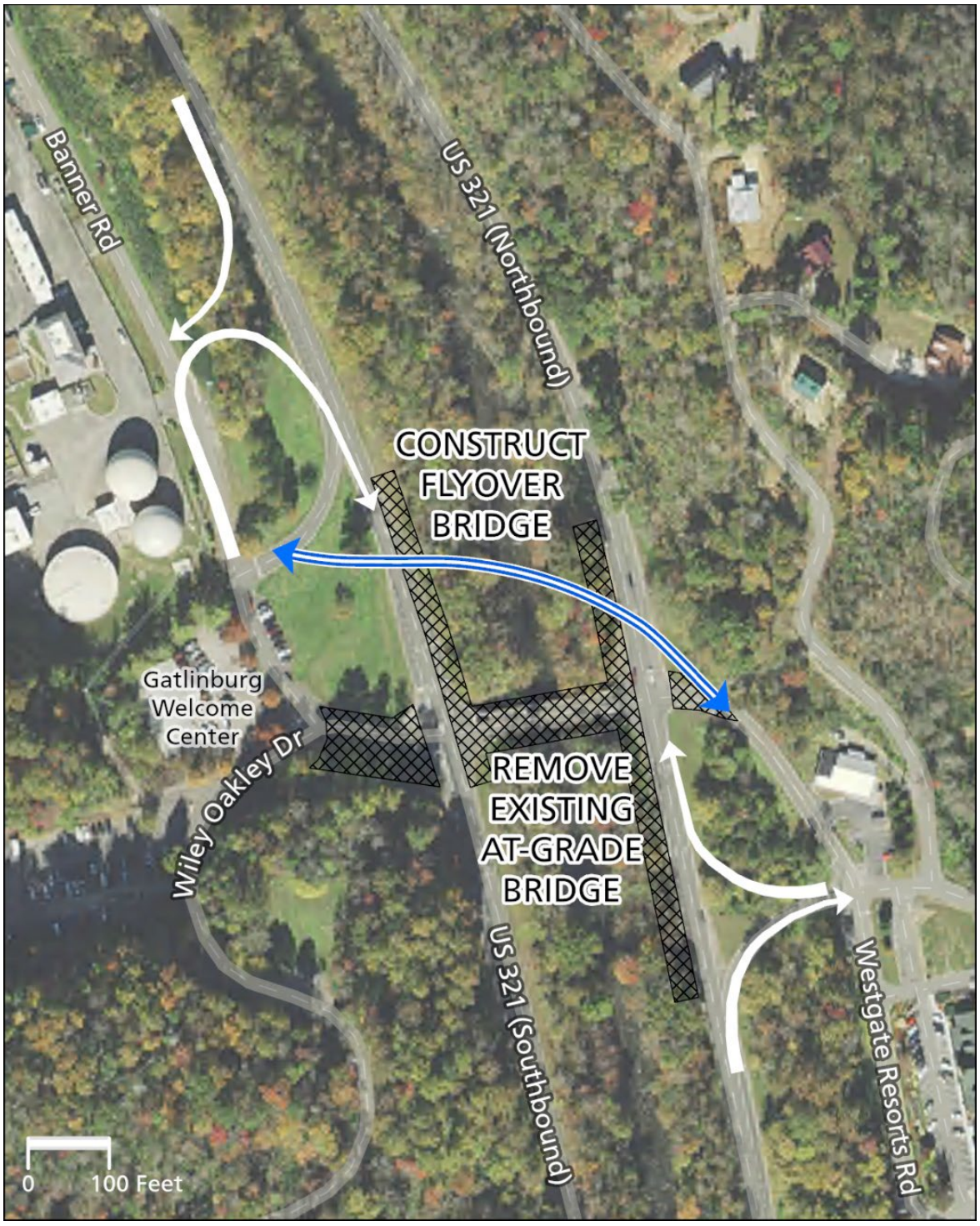

FIGURE 5: ALTERNATIVE 2—SUBAREA 3 PROPOSED FLYOVER BRIDGE

CONSTRUCTION

For both corridor-wide improvements and specific intersection improvements, construction activities near an open roadway may require a wider work zone along the Spur for safe operations. Establishing this work zone might include temporary realignment of the Spur (lane shifts), shoulder closures (cones or jersey barriers), temporary single lane closures (cones and barrels) and fixed lane closures (jersey barriers), detours, changes to two-way traffic, and nighttime work.

Tasks that involve work over an open roadway such as lifting bridge beams into place and placing concrete to construct bridge decks over the Spur might require rolling roadblocks where traffic is held temporarily to maintain public safety while materials are moved over the roadway.

Under alternative 2, the proposed subarea improvements would be implemented in phases as funding allows. Corridor-wide improvements could be implemented over the next five or more years. While duration of construction is not possible to determine at this early stage of design, NPS would seek to schedule traffic disruptions at a time of the day or season of the year, when they would minimize impacts on motorists traveling on the Spur and intersecting roadways.

Alternative 3

Under alternative 3, the Park would implement the same corridor-wide improvements and intersection improvements at subareas 1 and 2 as described under alternative 2. Construction methods and phasing under alternative 3 would be the same as described under alternative 2. The only difference from alternative 2 would be the proposed improvement at subarea 3, detailed below.

SUBAREA 3—WILEY OAKLEY DRIVE

Under alternative 3, the Park would construct two contra-flow bridges in place of the bridge at Wiley Oakley Drive. The two contra-flow bridges would be located approximately 1,400 feet north and south of the existing bridge along the Spur and would create intersections where vehicles could turn but could not continue straight (see figure 6). The construction of two bridges north and south of the existing bridge crossing would reduce the potential for at-grade perpendicular crashes. Similar to alternative 2, the existing bridge would be removed, and utilities would be relocated. The new bridges would be approximately 90 feet long; nine retaining walls would be needed, varying from 200 to 1,200 feet long and between 4 and 15 feet high. Each bridge could potentially be a one-way bridge, which would reduce the overall footprint. For a conservative analysis, the EA analyzes the larger two-way bridge option.

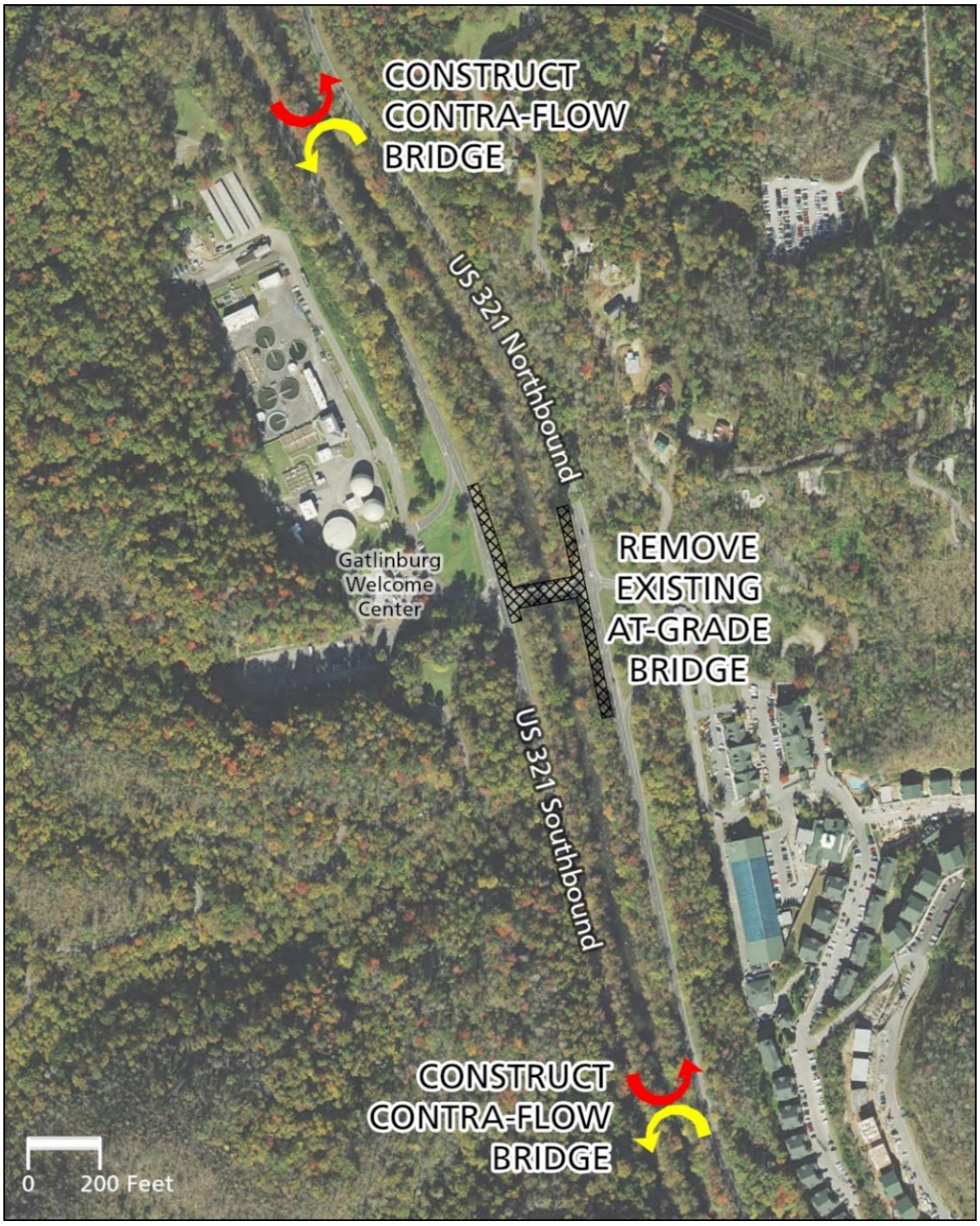

FIGURE 6: ALTERNATIVE 3—SUBAREA 3 PROPOSED CONTRA-FLOW BRIDGES

Alternative 4

Under alternative 4, the Park would implement the same corridor-wide improvements and intersection improvements at subareas 1 and 2 as described under alternative 2. Alternative 4 would also include the following improvement at subarea 3. Alternative 4 would restrict specific turning movements on the existing bridge and therefore not require new bridge construction. This alternative would reduce the potential for rolling road blocks. Similarly, under alternative 4, major construction would be anticipated to begin at subarea 1 and then 2; and minor construction could occur at subarea 3 at any time.

SUBAREA 3—WILEY OAKLEY DRIVE

Under alternative 4, the Park would restrict vehicles from making a left turn onto the bridge from the northbound Spur and would only allow traffic across the bridge one-way from the southbound Spur. Vehicles would also be restricted from crossing over the Spur when going to or from Westgate Resorts Road to the existing Wiley Oakley Drive bridge. Drivers would instead continue northbound on the Spur to the Huskey Grove crossover bridge and/or use local roadways to reach their desired destination.

Summary of Alternatives

Table 1 summarizes the type and location of disturbance and associated impacts by alternative**.**

TABLE 1: SUMMARY OF APPROXIMATE DISTURBANCE BY ACTION ALTERNATIVE

Disturbance Type	Alternative 2	Alternative 3	Alternative 4
Permanent Disturbance	4.5	6.25	2.5
Temporary Disturbance	6.5	6.25	5
Total Disturbance	11	12.5	7.5
Total Vegetation Disturbance*	2.8	3.4	2.5
Total Disturbance in Floodplain	1.3	2.25	<1
New Impervious Surface	2	4.75	1.2

*Does not include mowed/grassy road shoulders.

Mitigation Measures

NPS places a strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts; therefore, the following mitigation measures would be implemented under any of the alternatives to protect natural and cultural resources and ensure the quality of the visitor experience. The impacts analysis in chapter 3 assumes that the mitigation measures are implemented under all action alternatives.

- Conduct tree and vegetation clearing between November 15 and March 31 to avoid impacts on federally listed bats and nesting birds.
- Remove as few trees as possible during this project. Avoid and minimize impacts on retained trees adjacent to the area of disturbance by using management practices such as tree protection fencing, root pruning, and preventing compaction of soil over root systems. Avoid damage to and properly prune damaged limbs on retained trees using standard arboricultural practices.
- Perform surveys for nesting bald eagles prior to commencing project construction and adhere to all appropriate measures recommended by the 2007 National Bald Eagle Guidelines.

- Perform site inspections for potential bat roosting prior to any bridge removal. If bats are using the bridge, demolition work would be initiated between November 15 and March 31 to avoid and minimize disturbance. If a maternity colony is present, construction work would not be initiated between May 15 and August 15.
- Implement sediment and erosion control measures consistent with the requirements and recommendations contained in the Tennessee Department of Environment and Conservation's (TDEC) *Tennessee Erosion and Sediment Control Handbook* (TDEC 2012). File a Notice of Intent with TDEC to obtain coverage under the General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Stormwater Associated with Construction Activities (Permit Number TNR100000). Develop a site-specific stormwater pollution prevention plan in accordance with Part 3 of the General Permit that would:
    - Specify erosion-control materials that are weed-free, pest-free, and do not pose an entanglement risk to wildlife. Use natural fiber logs or fascines and natural fiber blankets that are certified as weed-free. Prohibit specific materials in the Park, including (1) imported hay bales, straw bales, wood chips, or mulch; and (2) all forms of plastic/synthetic mesh netting, including those that are label as biodegradable or photodegradable.
    - Include provisions for removal of temporary erosion and sediment control measures after vegetation is established and the site is stable.
- Implement a project-specific revegetation plan for areas temporarily disturbed during construction, including:
    - Conduct pre-construction surveys in the area of disturbance to identify native saplings, shrubs, and herbaceous plants for salvage.
    - Return temporarily disturbed areas to original grade or final grade as soon as practical and reseed with a park-approved seed mix. Aerate or scarify compacted soils prior to seeding to improve germination.
    - Where appropriate, replant salvaged vegetation in selected areas to facilitate and accelerate natural restoration.
    - Establish and maintain permanent grass cover in appropriate areas to meet road safety requirements (e.g., the roadside mow zone).
- Require the contractor to develop and adhere to a spill prevention control and countermeasures plan during construction.
- Adhere to the Best Management Practices and Conditions included in appendix 2 of NPS Procedural Manual 77-1 (NPS 2016) and the terms and conditions of the TDEC Aquatic Resource Alternation Permit (TDEC n.d.), if applicable, to minimize any potential impacts on streams and wetlands during any in-water work, including potential bridge removal.
- Require proper disposal of fill or slide materials and avoid disposal into a river or stream. Use crushed aggregate from an approved source, when not underneath paved surfaces.
- Temporarily stop work and immediately notify the Superintendent and Park Archeologist if cultural resources are inadvertently encountered during the project. Do not proceed with work until authorized by the Superintendent, in consultation with the Park Cultural Resources Program Manager or the Park Archeologist. Apply the discovery process defined by 36 CFR 800.13, the implementing regulations for the National Historic Preservation Act (16 United States Code [USC] 470. Evaluation of the discovery's significance would include consultation as appropriate with the state historic preservation office, the Advisory Council on Historic Preservation, and all

Tribes associated with the Park. If human remains, funerary objects, sacred objects, or objects of cultural patrimony were discovered, the process defined by 43 CFR 10.4-5, the implementing regulations of the Native American Graves Protection and Repatriation Act (25 USC 3001), would be applied.

- Require the contractor to remove food trash daily.
- Implement the following measures to avoid introduction of new invasive plant species to the project area and minimize the spread of existing invasive plants:
  - Clean all earthmoving and seeding equipment prior to entering the Park. Cleaning would include wheels, undercarriages, dozer belly pans, bumpers, and all parts of heavy equipment.
  - Use only topsoil, rock, sand, gravel, or other natural materials from Park-inspected and approved sources.
  - Conduct pre-construction surveys in the area of disturbance to determine if pre-construction invasive plant controls would be appropriate and effective. Treat priority invasive plant infestations prior to construction in selected areas based on survey findings. Focus on areas that would be restored to forested vegetation after construction, as opposed to areas that would be paved, hardened, or converted to maintained grass road shoulder. Monitor and retreat areas as appropriate following construction.
- Develop area-specific stormwater drainage plans and stormwater management practices to minimize potential long-term impacts on water quality from impervious surfaces and other changes to stormwater drainage. Design stormwater management practices to treat, store, and infiltrate runoff on-site before reaching the West Prong, when practicable. Examples of stormwater management practices that would be considered during design include grassed swales, infiltration basins, infiltration trenches, and bioretention (rain gardens).

Alternatives Considered but Dismissed

The project team discussed the potential of installing an acceleration lane from the Gatlinburg Bypass to the southbound Spur. This alternative was considered but dismissed because this location has no existing congestion issues. Additionally, the potential for installing traffic signals at intersections along the Spur was dismissed because of their incompatibility with the parkway purpose and design, as well as potential impacts on congestion in Gatlinburg and Pigeon Forge.

The project team also discussed additional alternatives both internally and as a result of public comments during the public scoping period. Suggestions included the installation of roundabouts (traffic circles), a regional subway system, shuttles, additional intersections, or widening the Spur. Many of these options are not compatible with the existing Spur constraints, such as limited right-of-way and topography, or with the Parkway design aesthetic, or did not meet the purpose and need in taking action for this EA. Other suggestions, such as a subway, shuttle, dedicated pedestrian facilities, or bike lanes, may be considered in future planning efforts. Additionally, the Park is considering a potential greenway along the Spur under a separate planning effort. As a result, this EA is focused on specific corridor-wide improvements and improvements at existing intersections.

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment and analyzes the potential environmental impacts of each alternative for the resources described below. The affected environment describes existing conditions for those elements of the human environment that would be affected by the implementation of the alternatives considered in this EA. Impacts on each of these topics are then analyzed in the "Environmental Consequences" section for each alternative. As required by the CEQ regulations implementing NEPA, this chapter compares the environmental consequences for each alternative.

Issues and Impact Topics

NPS identified a range of issues and impact topics to evaluate in this EA. Several issues were also eliminated from further consideration. The NPS *NEPA Handbook* provides specific guidance for determining whether to retain issues for detailed analysis. Issues should be retained for consideration and discussed in detail if:

- the environmental impacts associated with the issue are central to the proposal or of critical importance;
- a detailed analysis of environmental impacts related to the issue is necessary to make a reasoned choice between alternatives;
- the environmental impacts associated with the issue are a big point of contention among the public or other agencies; or
- there are potentially significant impacts to resources associated with the issue (NPS 2015a).

If none of the considerations above apply to an issue, it was dismissed from detailed analysis. Issues and impact topics dismissed from detailed analysis, including dismissal rationale, are provided below. Issues carried forward for detailed analysis fall under the following impact topics:

- Visitor Use and Experience
- Visual Resources
- Floodplains
- Surface Waters

ISSUES AND IMPACT TOPICS DISMISSED FROM DETAILED ANALYSIS

Vegetation Communities

Vegetation clearing and tree removal would be associated with all alternatives. Approximately 7.5 to 12.5 acres would be disturbed depending on the alternative (table 1). Of this acreage, between 5 and 9 acres are classified as developed land, which includes maintained road shoulders. Therefore, between approximately 2.8 and 3.5 acres of vegetation would be removed under alternatives 2 and 3. Alternative 4 would result in approximately 2.5 acres of vegetation removal. The affected vegetation types under all action alternatives would include Appalachian Ruderal (human-disturbed) Hardwood Forest, Chestnut Oak Evergreen Shrub Forest, Mixed Hardwood Floodplain Forest, Ruderal Tuliptree – Walnut Forest, and Yellow Pine (Dry Oak) Woodland. Under all alternatives, approximately 2 acres of vegetation disturbance would be to already-human disturbed vegetation types. As outlined in the "Mitigation Measures" section in chapter 2, a project-specific revegetation plan would be implemented for areas

temporarily disturbed during construction. Based on the proposed mitigation measures and the relatively small area affected, NPS determined that impacts from vegetation and tree clearing would not be potentially significant and dismissed this issue from further analysis.

Threatened and Endangered Plants

Federally listed and state-listed plant species are not expected to occur in the project area based on botany surveys conducted in April and August 2021 (NPS 2021). Therefore, potential impacts on threatened and endangered plants were dismissed from further analysis.

Non-native Invasive Plants

Non-native invasive plant infestations are relatively extensive throughout the Spur corridor compared to the interior of the Park. Managing invasive plants in this heavily used, narrow corridor surrounded by private development with abundant seed sources presents several challenges. Park efforts to control invasive plants in the corridor have generally resulted in short-term results. Long-term control or eradication of invasive plants in the corridor is not feasible without substantial control efforts on surrounding lands. Invasive plant mitigation measures outlined in chapter 2 focus on avoiding introduction of new invasive plants to the project area (equipment cleaning and use of weed-free materials) and minimizing the spread of invasive species in areas temporarily disturbed during construction (pre-construction treatments, monitoring, and retreatment in selected areas). Based on the proposed mitigation measures, NPS determined that impacts from invasive plants would not be potentially significant and dismissed this issue from further analysis.

Wetlands

No in-water work or piers would be required for any of the bridge construction except for the removal of the existing Wiley Oakley Bridge and relocation of the existing utility lines under alternatives 2 and 3. During bridge removal and installation of utility lines under the river under alternatives 2 and 3, in-water work surrounding the pier removal and utility trenching would temporarily disturb approximately 0.2 acres within the West Prong that are classified as wetlands in accordance with NPS Procedural Manual 77-1. Permits would be filed with the US Army Corps of Engineers and TDEC under sections 404 and 401 of Clean Water Act for removal of the Wiley Oakley Bridge. The utility owners would file for similar permits, as well as a special use permit from NPS for relocation of the existing utility lines. Mitigation measures established under the permits would minimize potential in-water impacts on the West Prong. In addition, applicable mitigation measures and best management practices listed in Appendix 2 of NPS Procedural Manual 77-1 Wetlands Protection would be implemented. The impacts would be temporary and after completed, the river would be restored to pre-construction contours and elevations. The wetlands would return to their natural condition after the bridge piers are removed, resulting in a beneficial impact. Similarly, all disturbance associated with the utility relocation would be restored to pre-construction contours, limiting impacts to short term during the construction period. As a result, the impacts on wetlands related to bridge removal and utility relocation were dismissed from further analysis.

Cultural Resources

No historic properties (historic sites, structures, districts, or archeological resources) eligible for listing on the National Register of Historic Places (National Register) are found in the project area. A Phase 1 archeological survey was completed for the project area in January 2021. No archeological resources eligible for listing on the National Register were identified. Based on these findings, NPS has made a preliminary determination that alternatives would have no effect on archeological resources. For aboveground historic resources, the Foothills Parkway itself, including the Spur, has been evaluated for National Register eligibility and was recommended not eligible for listing on the National Register (NPS 2015b).

One aboveground historic resource was identified outside of the project area but in the vicinity of the intersection improvements at subarea 2. The National Register-listed Perry's Camp property, also known as Flat Branch Court, flanks both sides of Flat Branch Road, immediately west of its intersection with Husky Grove Road. Constructed between 1928 and 1935, Perry's Camp is significant under Criterion A for entertainment/recreation and Criterion C for architecture. Although several buildings and features associated with the property were demolished in 1957 as part of improvements to US 321, the resource, as listed in 1992, has not been altered and continues to include a large cabin on the south side of Flat Branch Road consisting of an 1850s core structure remodeled with additions in 1928, and four smaller cabins built shortly afterward, arranged to its west along the north side of Flat Branch Road. The resource is an intact surviving example of a roadside motor court that exemplifies an early era of automobile tourism. The buildings retain a high level of architectural integrity through their use of rustic, natural materials and linear roadside grouping in a wooded setting (NPS 1992). Because of the heavily wooded and mountainous terrain, the construction of an acceleration lane on the southbound Spur would not have a direct effect on the resource or alter its viewshed. Temporary construction noise would occur but would not result in any permanent impact on the resource.

All consultation with the state historic preservation office will be documented in the decision document for this EA. Under all alternatives, if unknown archeological resources were discovered, the Park's standard protocol for inadvertent discoveries would apply, as detailed under the "Mitigation and Minimization Measures for the Proposed Action" section in chapter 2.

Because there would be no permanent impacts on cultural resources listed or eligible for listing on the National Register, this resource topic was dismissed from further analysis.

Wildlife

Implementation of the alternatives would not have a substantial impact on terrestrial wildlife in the area, and the impacts on wildlife would not be different under any of the alternatives. The installation of signage to alert motorists of their speed and the potential presence of wildlife (particularly bears) in the road may reduce animal-vehicle collisions. Impacts on available habitat would be minimal. As noted above, between 2.5 and 3.5 acres of habitat (vegetation) would be removed under any of the alternatives—this habitat would be primarily located adjacent to the existing disturbed roadway corridor and beneath any new bridge structures.

One bald eagle's nest was reported in the City of Gatlinburg, approximately 0.25 miles southwest of the southern boundary of the project area (and outside NPS property). The *National Bald Eagle Management Guidelines* recommend avoiding blasting and other loud, intermittent noises within half a mile of active nests (USFWS 2007). The location of the known nest is approximately 0.9 miles from the Wiley Oakley subarea, so intersection-specific actions would not affect the nest. Should any corridor-wide improvements, such as rock scaling, be recommended at the southern end of the project area, NPS would confirm the distance from the nest and adhere to any seasonal restrictions, if applicable.

Based on the relatively small area of affected habitat, the marginal quality of existing habitat, and the implementation of mitigation measures, NPS determined that impacts on wildlife and wildlife habitat would not be potentially significant and dismissed this issue from further analysis.

Threatened and Endangered Wildlife

The project area includes potentially suitable summer roosting and foraging habitat for the federally listed Indiana bat (*Myotis sodalis)* and northern long-eared bat (*Myotis septentrionalis*) as well as the little brown bat (*Myotis lucifugus*) and tricolored bat (*Perimyotis subflavus*), which, are currently under review to be listed under the Endangered Species Act. As outlined in the "Mitigation Measures" section in chapter 2, tree and vegetation clearing would be conducted between November 15 and March 31 to avoid impacts on bats.

The monarch butterfly (*Danaus plexippus)*, which is a candidate for listing under the Endangered Species Act, also has potential to occur in the project area. However, habitat along the Spur for this species is considered marginal because milkweed (*Asclepias* spp.), the host for its larval stage, was not found among 305 vascular plants identified during botanical surveys of the project area.

In accordance with section 7 of the Endangered Species Act, NPS initiated informal consultation with the US Fish and Wildlife Service and has requested concurrence from the Service that the preferred alternative may affect but is not likely to adversely affect federally listed species, species under review for listing, and candidate species. As a result, potential impacts on threatened and endangered species were dismissed from full analysis in the EA. The Park will complete the section 7 consultation process prior to finalizing the NPS decision document for this EA.

Aquatic Life

Aquatic species may experience temporary disturbance from in-water work associated with the removal of the existing bridge and associated utility relocation at Wiley Oakley Drive under alternatives 2 and 3; however, NPS would use coffer dams to reduce the potential for impacts. NPS would obtain approval for all instream work through General Aquatic Resource Alteration Permits and comply with all conditions and requirements stated in the permits. As discussed under the "Surface Waters," no noticeable impact is anticipated on water quality or quantity.

Geology

Rockfall mitigation measures could affect the geology within the project area by removing rock via scaling, mechanically removing, or rock anchors/bolting into rock faces. Cutting into the existing rockface at Huskey Grove southbound for the acceleration lane would also affect the existing rockface. Similarly, bridge footers for the flyover bridge at the Wiley Oakley subarea would require placing piers into the existing bedrock. Impacts on geology would be minimal and specific to the location of the improvement. Additionally, the potential to encounter acidic rock formations in the project area during construction is low (NPS 2012). Prior to the completion of the design phase, a geotechnical survey would be completed. Geotechnical surveys would inform the design by providing detailed information on the physical properties of substrate (e.g. rock), including the strength. These surveys ensure the rock would withstand the disturbance and associated structures and avoid adverse impacts. The overall geology of the project area would not be affected.

Soils

Construction of the alternatives, including the construction of new bridges, extension of acceleration lanes, and provisions for pull-off areas would affect soils, but this disturbance would occur mostly in previously disturbed areas, as detailed under the dismissal text in "Vegetation Communities," above. The area of disturbance would exceed 1 acre; therefore, an NPDES Stormwater Construction Permit would be obtained. Soil erosion and control measures would be implemented during construction consistent with the requirements and recommendations contained in the *Tennessee Erosion and Sediment Control Handbook* (TDEC 2012), as detailed in the "Mitigation and Minimization Measures for the Proposed Action" included in chapter 2. Therefore, this topic was dismissed from further analysis.

Air Quality

Sevier County is in a maintenance area for the 1997 ozone standard. Bridge construction would require the use of heavy equipment and could temporarily affect local air quality; however, impacts from construction would be temporary and would be below the de minimis threshold and would not trigger a General Conformity Rule Determination. While temporary impacts would occur during the construction period, no new permanent sources of air emissions would be associated with the action alternatives, the alternatives are not expected to affect traffic volumes, and no long-term impacts on air quality are

anticipated. Reduced congestion and improved LOS could reduce air pollutant emissions from queuing vehicles. Impacts on air quality are not central to the proposal, and this impact topic was dismissed from further analysis.

Socioeconomics

The proposed action would not substantially affect socioeconomics in the local area or surrounding county. Changes to the roadway, including new or reconfigured bridges, the extension of acceleration lanes, and corridor-wide improvements would be aimed at reducing congestion associated with existing and future traffic demand. These actions would not increase tourism or population growth in the area, although there may be short-term, beneficial impacts associated with construction spending during the construction period. A detailed analysis of socioeconomic impacts is not required to make a reasoned choice between alternatives; therefore, socioeconomics was dismissed from further analysis.

Noise/Soundscapes

There would be no long-term impacts on noise under the proposed action. The difference between traffic on an at-grade bridge versus a flyover bridge would not noticeably alter existing sources of noise in the project area. Short-term noise impacts would occur during construction; however, these impacts would be temporary. Therefore, this topic was dismissed from further analysis.

Wilderness

The project area is designated as transportation in the Park's *General Management Plan* (NPS 1982). The area is not managed as wilderness and is not adjacent to areas in the Park that are managed as wilderness. Therefore, this topic was dismissed from further analysis.

Lightscapes

The proposed action does not include installation of permanent lighting. Given the Spur's high traffic volume, some nighttime construction work would likely be necessary to minimize lane closures during peak traffic hours. Construction lighting would be required to safely accomplish nighttime work. Changes to lightscapes would be localized and short term. Construction lighting would follow any applicable local, state, or federal requirements regarding nighttime construction lighting. Therefore, this topic was dismissed from further analysis.

Climate Change

The alternatives are not expected to affect traffic volumes, thus minimal changes in carbon and other greenhouse gas emissions are expected. Similar to the discussion above regarding air quality, temporary greenhouse gas emissions would be associated with the construction period, but no long-term sources of emissions would be associated with the action alternatives. Reduced congestion and improved levels of service could reduce carbon emissions from queuing vehicles. The elements of the alternatives do not significantly vary in their effect on climate change. Therefore, the topic was dismissed from further analysis.

General Methodology for Establishing and Assessing Impacts

For each resource topic fully analyzed within this chapter, the affected environment is described. This description serves as an account of the baseline conditions within the project area upon which the impacts of each alternative are compared. CEQ regulations define effects or impacts as "changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives, including those effects that

occur at the same time and place as the proposed action or alternatives and may include effects that are later in time or farther removed in distance from the proposed action or alternatives" (40 CFR § 1508.1). The impact analyses and conclusions in this chapter are based on a review of existing literature, studies and research, information provided by experts within the NPS, professional judgment, and staff expertise and insights. Mitigation measures presented in "Chapter 2: Alternatives" are included in the analysis of impacts.

Visitor Use and Experience

AFFECTED ENVIRONMENT

The mission of NPS is to preserve unimpaired natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. It is a fundamental purpose of all parks that NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks (NPS 2006).

The Park is one of the most visited NPS units nationwide; approximately 70% of visitors enter the Park via the Spur through the downtown Gatlinburg entrance or the Gatlinburg Bypass entrance. Consequently, the Park experience for most visitors begins on the Spur. As visitors leave Pigeon Forge and enter the Spur corridor, they experience a dramatic change in scenery from a bustling tourist destination to a forested parkway setting with occasional views of the West Prong. This change in scenery may provide visitors with a sense that they have arrived at an iconic national park and may increase anticipation of adventures and natural wonders that lie ahead. Therefore, the visitor experience along the Spur is an important element of the overall Park experience for most visitors.

Traffic Congestion

As demonstrated by the existing LOS conditions provided in in appendix A, traffic congestion on the Spur can be a noticeable issue and can adversely affect the visitor experience. High traffic volume and congestion can also increase the risk of motor vehicle accidents, which can diminish the visitor experience. While residents and commuters may be more familiar with the curves and traffic patterns of the Spur, visitors may not have the benefit of that familiarity or awareness. While the posted speed limit varies between 25 and 45 miles per hour, the traffic study determined that 85% of drivers average between 5 to 10 miles over the posted speed limit during the peak season (FHWA 2019). The combination of high traffic volume, drivers with a lack of familiarity of the roadway, and high speeds increase the risk of motor vehicle collisions along the Spur. Additionally, at frequently congested intersections, such as subarea 3, when drivers are required to wait to make their desired turning movement, the "critical gap" (i.e., the minimum distance required for a vehicle on a smaller road to make a movement across or onto the larger road) may reduce as the time the driver has to wait increases. A specific example for the Spur could include when a vehicle wants to directly cross or merge onto the Spur from one of the intersection bridges. The longer a driver has to wait to make this movement, the more impatient they get and the smaller their critical gap may become, depending on driver behavior. The reduction in the critical gap can result in vehicle collisions.

Visitor Amenities

Visitor amenities in the Spur corridor include the Gatlinburg Welcome Center and several roadside pull-offs where visitors may access the West Prong for fishing or other forms of recreation. The Gatlinburg Welcome Center is located near subarea 3 on the southbound Spur and is operated as a partnership between the City of Gatlinburg, NPS, and the Great Smoky Mountains Association. The welcome center provides an opportunity for visitors to obtain Park information. Visitors can also park their vehicles at the welcome center and use the Gatlinburg and Pigeon Forge trolleys.

Trends

The Spur serves local communities, commuters, and commercial traffic, and experiences heavy year-round use that increases during the peak visitor seasons. Between 700,000 and 1.3 million vehicles use the Spur each month, and visitor use is highest in October and lowest in January, February, and May (NPS 2022). The average daily traffic on the Spur ranges from 36,000 to 49,000 vehicles (FHWA 2019; TDOT 2021). As noted in chapter 1, both Park visitation and development in the vicinity has noticeably increased over the past decade. An increase in traffic and visitation is anticipated to continue in future years, based on the 2021 statistics for vehicles entering the Park.

NPS actions that may occur in the project area in the future include the development of Foothills Parkway Section 8D and construction of a Gatlinburg Spur Greenway. NPS has reinitiated the planning process for the 9.8-mile Section 8D, which would connect the Gatlinburg Spur with Wears Valley and the western sections of the Foothills Parkway. This project would likely alter visitor and local traffic patterns, and has the potential to affect LOS on the Spur. A traffic study is being completed as part of the 8D planning effort to estimate future LOS at the proposed Spur/Foothills Parkway interchanges if Section 8D were built. Similarly, the Gatlinburg Spur Greenway project will explore the development of a multiuse (pedestrian and bicycle) trail between Gatlinburg and Pigeon Forge to connect with existing and future greenways in these gateway communities. In general, these projects would result in long-term, beneficial impacts on visitor use and experience by providing a broader range of recreational opportunities.

ENVIRONMENTAL CONSEQUENCES

Based on internal and external scoping, Park staff identified the following visitor use and experience issues for analysis in the EA:

Issue – Congestion: The proposed intersection-specific improvements would improve congestion on the Spur, which could enhance visitor experience.

Alternative 1 – No Action

Under the no action alternative, the Spur would retain its existing traffic patterns and road geometry. Over time, congestion is expected to increase and would result in longer delays and queuing, as noted above. The longer delays and queuing could reduce the critical gap for drivers and increase vehicle accidents. Impacts on visitor use and experience for drivers on the Spur would be long term and adverse from the increase in congestion, delays, and queuing. There would be no change to the existing visual character of the Spur.

Alternative 2

The implementation of proposed intersection improvements under alternative 2 would generally improve LOS at the subareas. In addition to the beneficial impacts from improved LOS, the improvements would benefit overall visitor experience by providing a longer line of sight for merging into the Spur. The most noticeable beneficial impact would be at subarea 3, where at-grade travel between the north and southbound Spur would be removed and replaced with a grade-separated flyover bridge. This change from existing traffic patterns would allow drivers to more quickly traverse the Spur. Delays and queuing associated with existing conditions would be reduced, and visitors who were not as familiar with the Spur would be able to access the welcome center more easily. Motorists may experience localized, short-term impacts during the construction period from increased congestion if lane closures are needed, including the potential for short-term closures of the Spur during construction tasks that involve work over an open roadway such as lifting bridge beams into place and placing concrete to construct bridge decks. These impacts would occur only during the construction period.

In addition to the intersection-specific improvements, shoulder hardening, new pull-offs, and curb and gutter treatments in selected locations would more clearly delineate where it is safe and appropriate for drivers to pull over and exit the Spur road prism. These designated pull-off locations are intended to provide a temporary location for drivers to review directions/confirm their route or handle a vehicle issue (e.g., flat tire). However, without discouragement by Park law enforcement, these areas could potentially be used as a parking location for fishing or enjoying the West Prong. Pulling over during heavy traffic periods could have adverse effects on traffic if other motorists are unaware of the potential for slower vehicles. Proper pull-off siting and signage would be used to reduce this potential impact. Similarly, preventing rockfall into the roadway would improve the visitor experience of the Spur by reducing the potential for rockfalls in the roadway that create traffic delays. Intelligent transportation systems would alert drivers to their driving speed as compared to the posted speed limit and may serve to slow down drivers along the well-traveled roadway. Intelligent transportation systems would also inform drivers of bear activity along the Spur, which may reduce bear-vehicle collisions. Overall, impacts on visitor use and experience would be long term and beneficial from reduced congestion and improved infrastructure siting and signage.

In summary, increasing visitation and development in the vicinity have increased congestion along the Spur. One of the goals of the planned projects is to provide acceptable LOS at proposed interchanges. Visitation, population growth, and associated congestion are expected to continue to increase over time. In consideration of these trends, alternative 2 is anticipated to support other planned projects in benefiting visitor use and experience by providing a less congested experience and improving LOS at specific intersections along the Spur.

Alternative 3

Impacts on visitor use and experience under alternative 3 would be the same as those described for alternative 2, except in subarea 3. LOS at subarea 3 would be reduced by the construction of two contra-flow bridges, but the intersections may still experience stop and go traffic and delays associated with the new bridges. Similarly, Spur users would be entering the Spur at grade, which could result in accidents associated with the critical gap from longer queuing. As a result, alternative 3 would result in overall beneficial impacts on visitor experience from improved LOS, infrastructure siting and signage, but the impacts would be slightly less beneficial compared to alternative 2. In consideration of the trends described under alternative 2, alternative 3 is anticipated to support other planned projects in benefiting visitor use and experience by providing a less congested experience and improving LOS at specific intersections along the Spur.

Alternative 4

Like alternative 3, impacts on visitor use and experience under alternative 4 would be the same as those described for alternative 2, except in subarea 3. LOS at subarea 3 would be improved by eliminating the ability of vehicles to cross the northbound Spur lanes to access the bridge or Wiley Oakley Drive. However, under alternative 4, circulation patterns would also be noticeably altered, which would likely increase drive times for Spur users, specifically those on the eastern side of the Spur at subarea 3. While alternative 4 would result in an overall beneficial impact on visitor experience from changes to vehicular access, the improvements at subarea 3 would also result in localized adverse impacts related to increased travel time and departures from existing vehicle circulation patterns. As a result, alternative 4 would have overall beneficial impacts on visitor experience but would be slightly less beneficial compared to alternatives 2 and 3. In consideration of the trends described under alternative 2, alternative 4 is anticipated to support other planned projects in benefiting visitor use and experience by providing a less congested experience and improving LOS at specific intersections along the Spur to a lesser extent than alternatives 2 and 3.

Visual Resources

AFFECTED ENVIRONMENT

The Spur is part of the Foothills Parkway. Parkways are intended to be beautifully designed roads that often include pull-offs where visitors can enjoy views. There are seven Congressionally mandated parkways, including the Foothills Parkway. The Spur is considered a limited-access road in parkway character, accommodating commercial traffic in addition to recreational traffic (NPS 1968). The current visual character of the Spur is dominated by the winding road through a narrow, forested canyon with occasional views of the West Prong. Due to topography and vegetation, relatively limited development can be seen from the roadway. Development is more prominent where the Spur intersects with local roadways. Infrastructure associated with the Spur includes both at grade and elevated bridges, most with stone wingwalls, timber guardrails, or stone guardwalls. Exposed rockfaces also contribute to the visual character of the Spur. Modern infrastructure includes utility infrastructure, such as distribution wires for electrical utilities and cell towers. Photos of the Spur, including the subareas, are provided in figures 7 through 12. Visual character is just one of the diverse visitor experiences that are available to visitors within a national park unit. Visual character can be determined by multiple factors including context, setting, attractiveness, variety, and the relationship to the park purpose and significance. In some areas of the Park, visual character provides visitors with an understanding and appreciation of enduring cultural ties to the land. Along the Spur, the visual character contributes to the 350 miles of scenic roadways that showcase the Park's highest peaks, mountain valleys, and riverways (NPS 2016). The Spur allows visitors to enjoy the park setting and resources on their way to other destinations in or outside the Park (NPS 2016).

FIGURE 7: SUBAREA 1—GUM STAND ROAD / KING BRANCH ROAD (SOUTHBOUND, FACING EAST)

FIGURE 8: SUBAREA 1—GUM STAND ROAD / KING BRANCH ROAD (NORTHBOUND, FACING NORTH)

FIGURE 9: SUBAREA 2—HUSKY GROVE ROAD / FLAT BRANCH ROAD (SOUTHBOUND, FACING NORTH)

FIGURE 10: SUBAREA 2—HUSKY GROVE ROAD / FLAT BRANCH ROAD (NORTHBOUND, FACING NORTHWEST)

FIGURE 11: SUBAREA 3—WILEY OAKLEY DRIVE (SOUTHBOUND, FACING EAST)

FIGURE 12: EXISTING PULL-OFF AND MAINTAINED SHOULDER (NORTHBOUND)

Trends

The visual character of the Spur has remained consistent across most of the roadway and would continue to be dominated by the winding roadway through a narrow, forested canyon with views of the river. Over the last 10 to 20 years, increasing development has occurred along the Spur but vegetation and topography have limited the visibility of this development to specific intersections, including subarea 3.

NPS actions that may occur in the project area in the future include the development of Foothills Parkway Section 8D and construction of a Gatlinburg Spur Greenway. The development of Section 8D would introduce a new flyover bridge in the vicinity of subarea 1 and may alter the existing visual character of the Spur. Similarly, a greenway along the river corridor may alter the existing visual character by introducing a new built element. The greenway would be designed to minimize tree removal as much as possible to maintain the forested quality and associated impacts on visual character; however, substantial tree removal is likely unavoidable. Section 8D would include a bridge over the Spur, but the height, location, and visual quality of the bridge have not been determined. Similar to the proposed intersection improvements to the Spur, the flyover bridge for Section 8D would use concrete, stone masonry, or stone veneer finish to match the existing visual character of the Spur. While both of these projects would alter the existing visual character, they would not alter the overall parkway setting.

ENVIRONMENTAL CONSEQUENCES

Based on internal and external scoping, Park staff identified the following visual resource issues for analysis in the EA:

Issue – Visual Character: Removal of trees and construction of new bridges, retaining walls, acceleration lanes, and pull-offs would alter the existing visual character of the Spur, which could affect visitor experience.

Alternative 1 – No Action

Under the no action alternative, the Spur would retain its existing traffic patterns and road geometry. Over time, LOS is expected to increase and would result in longer delays and queuing, as noted above. There would be no change to the existing visual character of the Spur.

Alternative 2

While alternative 2 would enhance the visitor experience by improving LOS, it would also alter the existing visual character of the Spur. Elements of the proposed action that could affect the visual character of the Spur include tree removal, construction of a new bridge, increases in paved surfaces, modification of existing bridges, and construction of new retaining walls. Specifically, modifying the existing bridge at subarea 1 to a contra-flow pattern would require widening the existing bridge and turning lanes on either end to accommodate the turning radii of larger vehicles, including emergency vehicles. This change would increase paved surfaces by less than 1 acre, although most of this change would occur on flat grassy areas adjacent to the Spur. The bridge would include two retaining walls, one each on the inside of the north and southbound Spur, between the river and the road. These retaining walls would be approximately 775 to 840 feet long and 9 to 10 feet tall. There would be minor tree removal on both sides of the Spur across approximately half an acre. Visitors would likely be able to see the retaining walls on the opposite side of their travel lane, and the walls would be more noticeable during leaf off conditions. The walls would be most visible to visitors fishing on this section of the West Prong, but there are no existing pull-offs or parking to facilitate visitor use in this location.

Similarly, a retaining wall of approximately 775 feet long and 25 feet tall would also be required at subarea 2 to extend the southbound Spur acceleration lane. The retaining wall would be within the line of site of drivers traveling southbound and would be a noticeable departure from the existing conditions, which includes an exposed rockface, vegetated cut slope, and forested slopes. Similar to subarea 1, a below-grade retaining wall would be built on the northbound Spur at subarea 2; however, this wall would be approximately 160 feet long and less than 8 feet tall. Impacts on the visual character from this retaining wall would be similar to those described for subarea 1, with the biggest potential impact on visitors fishing in this section of the West Prong. While there are no pull-offs in this location, some visitors could park along Huskey Grove Road adjacent to the northbound Spur to access the river. Approximately 2 acres of vegetation would be removed between the two retaining walls, and the acceleration lanes would contribute approximately 0.50 acres of new roadway.

The construction of a new flyover bridge at subarea 3 would also introduce a new visual element to the Spur. The bridge would be approximately 410 feet long with at least 16 feet of vertical clearance over the existing Spur. A small retaining wall, approximately 30 to 40 feet long and 5 to 7 feet high, would also be required. Impacts on the visual character from the retaining walls would be similar to those described for subarea 1, again with the biggest potential impact on visitors fishing in this section of the West Prong. The additional on- and off-ramps associated with the bridge would contribute approximately less than 1 acres of new road surface, and the overall bridge construction would remove less than half an acre of vegetation (the predominately impacted land use is already developed land).

The implementation of corridor-wide improvements would also alter the existing visual character of the Spur. While shoulder hardening, curb and gutter, and pull-off locations would introduce new pavement or hardened areas, these improvements would be in existing grassy areas that are flat with a clear sightline, so impacts would be a noticeable departure but limited to localized areas along the Spur.

Rockfall mitigations could also alter the visual character of Spur. While some mitigation options, such as scaling loose rock material and installing anchors may not be readily noticeable by visitors, others could have a larger visual intrusion, such as altering the road alignment, installing barriers, or applying shotcrete As noted in chapter 2, the methods applied for rockfall mitigation would be specific to individual locations and would prioritize safety while accommodating aesthetics as much as possible. Tailoring the

rockfall mitigation to each individual location using context-sensitive design and materials consistent with existing materials would minimize impacts on visual character.

Overall, alternative 2 would result in slightly less than 3 acres of vegetation removal along the forested Spur, predominately associated with the southbound acceleration lane in subarea 2; however, the Spur would retain its overall vegetated existing character. While all retaining walls and bridge alterations or construction would use concrete, stone masonry, or stone veneer finish to match the existing visual character of the Spur, the change from the existing visual character of the Spur could result in long-term, adverse impacts on visual resources. The changes in visual character would be most noticeable for the acceleration lane, retaining wall, and associated forest clearing in subarea 2 and the new flyover bridge in subarea 3. Long-term trends, including increasing development and planned NPS projects in the vicinity, also have the potential to alter the visual character of the Spur; however vegetation and topography help limit the visual impacts. In consideration of these trends, alternative 2 is anticipated to contribute additional vegetation removal, increase paved surfaces, and alter existing infrastructure—adversely affecting the visual character of the Spur. In the context of the Spur, the existing development and proposed improvements would be consistent with the design of existing bridges over the Spur, the *Foothills Parkway Master Plan*, and the vision of the Spur as a limited-access road. Incorporating retaining walls and bridges that match the visual character of the Spur and application of visually appropriate rockfall mitigation measures would reduce the adverse impact.

Alternative 3

Impacts on the visual character under alternative 3 would be the same as described under alternative 2 for the corridor-wide improvements and subareas 1 and 2. At subarea 3, the visual character would be slightly altered. Instead of one at-grade bridge, there would be two; however, the height and aesthetics of the bridges would be consistent with the existing visual characteristic of the Spur. Alternative 3 would also require nine retaining walls of approximately 200 to 1,200 feet long and ranging from 3 to 15 feet tall. The visual impacts associated with these retaining walls would be similar to those described for subarea 1 under alternative 2, because they would be below the grade of the existing roadway and would use a stone veneer to match the current Parkway aesthetic. Development of the two new bridges would result in the addition of 3.5 acres of new impervious surface and the removal of approximately 1 acre of vegetation. In consideration of the trends described under alternative 2, alternative 3 is anticipated to contribute additional vegetation removal, increase paved surfaces, and alter existing infrastructure—adversely affecting the visual character of the Spur. Like alternative 2, the proposed improvements would also be consistent with the *Foothills Parkway Master Plan* and the vision of the Spur as a limited-access road and would not alter the visual character Spur-wide. Impacts on the visual characteristic of the Spur would be long term and adverse but localized.

Alternative 4

Impacts on the visual character as it relates to the visitor experience under alternative 4 would be the same as described under alternative 2 for the corridor-wide improvements and subareas 1 and 2, including the removal of approximately 2.5 acres of vegetation. There would be no visual changes at subarea 4, except for minor traffic flow measures such as a wall to prevent movements directly across the northbound Spur from the bridge, which would reduce the potential adverse impacts compared to alternatives 2 and 3. In consideration of the trends described under alternative 2, alternative 4 is anticipated to contribute additional vegetation removal, increase paved surfaces, and alter existing infrastructure—adversely affecting the visual character of the Spur, but to a lesser extent than alternatives 2 and 3. Like alternative 2, the proposed improvements would be consistent with the *Foothills Parkway Master Plan* and the vision of the Spur as a limited-access road with commercial use. Impacts on the visual characteristic of the Spur would be long term, adverse, and localized.

Floodplains

AFFECTED ENVIRONMENT

The project area is located within the Lower French Broad River watershed within the West Prong Little Pigeon River subwatershed between Gatlinburg and Pigeon Forge, Tennessee (NWQMC 2021). Beyond Pigeon Forge, the West Prong merges with the main stem of the Little Pigeon River in Sevierville and then flows until it meets the French Broad River below Douglas Lake. The West Prong can overflow its bank during localized high flow events.

The Federal Emergency Management Agency (FEMA) defines Zone A and Zone AE floodplains as areas with a 1% annual chance of flooding (i.e., located within the 100-year floodplain), but notes Zone A lacks detailed analyses defining base flood elevations while base flood elevations are defined in Zone AE (FEMA 2020). The project area contains 61.3 acres of Zone A and 7.2 acres of Zone AE. Portions of the existing southbound Spur are located within the West Prong floodplain classified as Zones A and AE. The portions of the project area outside the West Prong Zone A and Zone AE floodplains are classified as Zone X. These areas have minimal flood hazard and are above the 500-year flood level (FEMA 2019). The project area also includes 11.2 acres of Floodway, which are a part of Zone AE. FEMA defines a Floodway as the channel of a river and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (FEMA 2020).

Landcover upstream of the project area includes developed areas of medium to high density (Gatlinburg, Tennessee) and steep areas of deciduous and evergreen forest (USGS 2021). Floods of potential consequence at the West Prong generally occur with some warning. In general, a prolonged period of intense rain for about 12 to 24 hours could create extreme flood conditions. USGS gage 03469251 West Prong Little Pigeon River near Gatlinburg, TN, records flow conditions within the West Prong just above the project area (USGS 2022). Although the West Prong has not flooded onto the Spur roadway in recent memory, Gatlinburg city officials maintain the city's emergency siren system for extreme flooding conditions.

Floodplain values associated with the West Prong within the project area include the ability of the floodplain to absorb increased water flows, recharge groundwater, and provide floodplain habitat. Floodplains in the project area provide wildlife habitat for wetland and riparian species, allow for flood storage, and facilitate conveyance. Executive Order 11988, "Floodplain Management," and Executive Order 13690, "Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input," require NPS and other federal agencies to evaluate the likely impacts of actions in floodplains and to improve the nation's resilience to flood risk. The objective of Executive Order 11988 is to avoid, to the extent possible, the long- and short-term, adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Executive Order 13690 was issued to establish a Flood Risk Management Standard for federally funded projects to improve the nation's resilience to floods and to ensure new federal infrastructure will last as long as intended. NPS requirements for complying with the floodplain executive orders are outlined in NPS Procedural Manual 77-2 and Director's Order 77-2. The draft floodplains statement of findings, which describes the rationale for construction within a floodplain and discloses the amount of risk associated with an action, is provided in appendix B. The statement of findings provides a map of all floodplains in the project area and detailed maps of the floodplains in each subarea for the preferred alternative.

Trends

Sea level rise and climate change considerations could increase the frequency of strong storm events or increase rainfall, which could raise water levels of the West Prong. Storm events occurred in 2019 and

2020 causing rockfalls and downed trees that closed the Spur and flooding on other local roadways. While these storm events may increase in frequency, the delineated floodplains are not anticipated to change, and the Spur roadway is only expected to flood in rare events. Future projects with the potential to affect floodplains include the potential development of Parkway Section 8D, the Gatlinburg Spur Greenway, and the expansion of the Gatlinburg Wastewater Treatment Plant, which is partially located within the floodplain. The Gatlinburg Spur Greenway project would develop a greenway adjacent to the West Prong. While the greenway has not been designed, it is likely that portions of it would be located within the floodplain. Potential flood risks would be an important consideration during greenway design, and potential impacts would be avoided and minimized to the extent practicable through sustainable design practices. The greenway would be designed to withstand floodwaters and not alter the function of the floodplain, which would limit potential adverse impacts. However, some impacts would be unavoidable given its proximity to the West Prong. For example, portions of the greenway within the floodplain would be susceptible to flood damage and would require tree clearing and ground disturbance within the floodplain. Parkway Section 8D would complete the connection between the Gatlinburg Spur and the Parkway to the west and would include a bridge crossing the Spur and West Prong and intersections with the Spur in the vicinity of subarea 1. Current preliminary designs do not include any infrastructure within the floodplain. In general, these projects could have long-term, adverse impacts by adding impervious features within the floodplain, but they would not alter floodplain functions and values or cause an increase in flood events along the Spur.

ENVIRONMENTAL CONSEQUENCES

Based on internal and external scoping, Park staff identified the following floodplain issues for analysis in the EA:

Issue – Construction in a Floodplain: Construction of new infrastructure and modification of existing infrastructure in the West Prong floodplain could change flood risks to human health and safety and property and affect natural floodplain functions and values.

Alternative 1 – No Action

Under the no action alternative, the Spur would retain its existing traffic patterns and road geometry. Floodplain conditions would not change from existing conditions.

Alternative 2 – NPS Preferred Alternative

Corridor-wide improvements would not be located within a floodplain and are not discussed further. The intersection-specific improvements would affect the floodplain in all three subareas. Ground disturbance and vegetation clearing in and adjacent to the floodplain during construction would temporarily increase stormwater runoff volume, soil erosion, and sediment transport, which would affect floodplain values. Construction would affect approximately 1.3 acres of vegetation in the floodplain (table 2), including both grass and riparian vegetation along the river. Of the approximately 1.3 acres, approximately 0.25 acres would be permanently removed. Vegetated areas, temporarily disturbed during construction, including those in the floodplain, would be reseeded with a Park-approved seed mix following construction and restored in accordance with a project-specific revegetation plan. In addition to temporary impacts during construction, removal of vegetation and creation of new approximately 2 acres of new impervious surface would result in long-term impacts on floodplain values including natural flood control, erosion control, and habitat. The draft statement of findings provided in appendix B provides additional details regarding the specific disturbances at each subarea.

No in-water work would be required for the construction of the flyover bridge except for the removal of the existing Wiley Oakley Drive bridge and the relocation of existing utilities. Two smaller piers, approximately 6-feet in diameter, would be located within the 100-year floodplain but outside the West

Prong, reducing the amount of infrastructure within the floodplain. After bridge removal and utility relocation are complete, the bottom of the river would be restored to natural or existing conditions. As outlined in "Surface Waters," applicable permits from the US Army Corps of Engineers and TDEC would be obtained prior to conducting instream work. Utility lines would be encased in concrete beneath the river bottom to ensure durability. As a result, utility relocation would not alter the floodplain functions or values in the long term.

Together with the corridor-wide improvements, the three subareas would contribute approximately 2 acres of new impervious surface in the project area, including approximately 0.25 acres of impervious surface within the floodplain, which would be within or adjacent to the existing Spur. While new impervious surface would be added, the project would also remove approximately 1 acre of impervious surface associated with the removal of existing roads (including on-ramps and turning lanes) and bridge, resulting in a net increase of approximately 1 acre of new impervious surface. The project design phase would include development of stormwater drainage plans and stormwater management practices to minimize potential impacts on floodplain values from impervious surfaces. Table 2 summarizes the floodplain disturbance under alternative 2.

TABLE 2: ACRES OF DISTURBANCE IN THE FLOODPLAIN (ALTERNATIVE 2)

Location	Temporary	Permanent	Total
Subarea 1	0.69	0.02	0.71
Subarea 2	0.01	0	0.01
Subarea 3	0.36	0.2	0.56
Bridge and Road Removal in Subarea 3 (not included in total)		-0.67	-0.67
Corridor-Wide Improvements	0	0	0
TOTAL	**1.06**	**0.22**	**1.28**

As discussed in chapter 2, under "Mitigation Measures," during construction activities, NPS would implement sediment and erosion control measures consistent with the requirements and recommendations contained in the *Tennessee Erosion and Sediment Control Handbook* (TDEC 2012). In addition, a Notice of Intent would be filed with TDEC to obtain coverage under the General NPDES Permit for Discharges of Stormwater Associated with Construction Activities (Permit Number TNR100000). A site-specific stormwater pollution prevention plan would be developed in accordance with Part 3 of the General Permit, as required. For long-term impacts, NPS would implement a project-specific revegetation plan for areas disturbed during construction. Construction of retaining walls, bridges, and the addition of cut or fill in each subarea would not constrict flow or increase water surface elevations upstream and would result in minimal long-term impacts on floodplains.

Overall, construction activities under alternative 2 would slightly increase the amount of impervious surface in the West Prong floodplain and result in the removal and permanent loss of riparian vegetation along the West Prong. Together, the three subareas contain approximately 11 acres of existing impervious surface, so the addition of 1 acre, including approximately 0.25 acres within the floodplain, would not represent a departure from existing conditions. The proposed action has the potential to introduce point sources (e.g., curb and gutter treatments) for stormwater runoff directly into the West Prong with less filtering through vegetation, but these areas would be limited to up to 3,000 linear feet across a 4.2-mile area. In addition, total ground disturbance associated with alternative 2 of up to 11 acres could cause erosion and sediment transport to the West Prong during construction. Long-term trends, including planned projects in the vicinity, have the potential to contribute impervious surface and infrastructure in

the floodplain. In consideration of these trends, alternative 2 is anticipated to contribute a slight increase in the amount of new impervious surface, but it would also remove the existing bridge piers from the waterway at subarea 3.

Alternative 3

Impacts on floodplains under alternative 3 would be the same as those described for alternative 2 for corridor-wide improvements and subareas 1 and 2. At subarea 3, the construction of two contra-flow bridges would introduce additional infrastructure within the floodplain, including 1.05 acres of permanent infrastructure and 0.41 acres of cut and fill. While the existing at-grade bridge at subarea 3 would be removed, the two new bridges would also be at-grade. Neither of the new bridges is expected to alter the existing function of the floodplain, similar to alternative 2. Also similar to alternative 2, construction activities under alternative 3 would slightly increase the amount of impervious surface in the West Prong floodplain and result in the removal and permanent loss of riparian vegetation along the West Prong. Because of the larger footprint of subarea 3 under alternative 3, approximately 14 acres of impervious surface currently exist across all three subareas. While new impervious surface would be added, the project would also remove approximately 1 acre of impervious surface associated with the bridge removal, resulting in a net increase of approximately 4 acres, including 1.07 acres within the floodplains (table 3). Alternative 3 would result in long-term impacts on floodplains from the additional construction but is not expected to alter the existing function of the floodplain, as described under alternative 2. In consideration of the trends described under alternative 2, alternative 3 is anticipated to contribute a slight increase in the amount of new impervious surface, but it would also remove the existing bridge piers from the waterway at subarea 3.

TABLE 3: ACRES OF DISTURBANCE IN THE FLOODPLAIN (ALTERNATIVE 3)

Location	Temporary	Permanent	Total
Subarea 1	0.69	0.02	0.71
Subarea 2	0.01	0	0.01
Subarea 3	0.41	1.05	1.46
Bridge and Road Removal in Subarea 3 (not included in total)		-0.67	-0.67
Corridor-Wide Improvements	0	0	0
TOTAL	**1.11**	**1.07**	**2.18**

Alternative 4

Impacts on floodplains under alternative 4 would be the same as those described for alternative 2 for corridor-wide improvements and subareas 1 and 2. There would be no change from existing conditions, including any infrastructure in the floodplain associated with subarea 3, and the existing Wiley Oakley Drive bridge would remain as an existing structure within the floodplain. As a result, there would be less than an acre of floodplain disturbed under alternative 4 (table 4). The impacts of this disturbance at subareas 1 and 2 would be the same as those described under alternative 2. In consideration of the trends described under alternative 2, alternative 4 is anticipated to contribute a slight increase in the amount of new impervious surface.

TABLE 4: ACRES OF DISTURBANCE IN THE FLOODPLAIN (ALTERNATIVE 4)

Location	Temporary	Permanent	Total
Subarea 1	0.69	0.02	0.71
Subarea 2	0.01	0	0.01
Corridor-Wide Improvements	0	0	0
TOTAL	**0.70**	**0.02**	**0.72**

Surface Waters

AFFECTED ENVIRONMENT

The project area is located within the Lower French Broad River (06010107) Hydrologic Unit Code (HUC) watershed (509,776 acres). At a finer scale, the project area is within the West Prong subwatershed (12-digit HUC 060101070206) between Gatlinburg, Tennessee, and Pigeon Forge, Tennessee (NWQMC 2021). Overall, the West Prong exhibits a perennial streamflow pattern with low flows in summer and fall, low to moderate base flow in winter, and occasional winter and summer peaks associated with storm events.

TDEC manages water quality in the project area under the criteria standards, antidegradation statement, and use classifications found in chapters 1200-4-3, 0400-40-03, and 0400-40-04 of the General Water Quality Criteria (TDEC 2021a). Designated use classifications for surface waters in the project area include domestic and industrial water supply, fish and aquatic life, recreation, livestock watering and wildlife, and irrigation (USEPA 2021a). Portions of the West Prong along the Spur are also classified as Tennessee Exceptional Waters.

The main sources of water quality degradation in the project area are potentially pathogenic bacteria and nutrient loading from nonpoint sources associated with existing residential septic systems, sanitary sewer overflows, and stormwater runoff (USEPA 2021b). Sediment and nutrient (e.g., phosphorus) loading from erosion and degradation associated with land development and disturbance, stream channel alteration (i.e., channelization), and stormwater runoff also affect existing surface waters. The US Environmental Protection Agency also lists nutrient loading from municipal point sources as a potential source of degradation (USEPA 2021b).

As required by Section 303(d) of the Clean Water Act, the state identifies surface waters that are not meeting their designated uses or are expected to exceed water quality standards in the next two years and need additional pollution controls. The West Prong (stream segments TN06010107010_1000 and TN06010107010_2000) is included on the 2020 303(d) list for phosphorus, sedimentation and siltation, *E. Coli*, temperature, and other anthropogenic substrate alterations (USEPA 2021b). A small portion of stream segment TN06010107010_2000 (0.1 miles of 5.7 miles) is within the Park boundary. This segment is listed as impaired for fish and aquatic life and recreation uses but is in good standing for other designated uses, including domestic and industrial water supply, irrigation, wildlife, and livestock watering (USEPA 2022).

Trends

The West Prong is an impaired waterway, and the main sources of water quality degradation would continue to be from nonpoint sources associated with existing residential septic systems, sanitary sewer overflows, and stormwater runoff. As an impaired waterway not meeting its designated uses, it is anticipated that TDEC and USEPA will implement additional pollution controls as required by the Clean Water Act. Future projects with the potential to affect water quality include the proposed Gatlinburg Wastewater Treatment Plant upgrade and expansion. The plant is currently operating at/near capacity.

Increasing the capacity of the plant from 3.0 million gallons per day to 4.5 million gallons per day would add to the amount of treated wastewater effluent discharged to the West Prong. Upgrading the plant would improve the quality of effluent discharged to the West Prong, resulting in long-term change in pollutant loadings or water quality in the West Prong. The construction of the Spur Greenway and Section 8D would increase the amount of impervious surface, increase stormwater runoff, and remove riparian vegetation. Design of stormwater drainage and other mitigation measures would minimize impacts.

ENVIRONMENTAL CONSEQUENCES

Based on internal and external scoping, Park staff identified the following surface water quality issues for analysis in the EA:

Issue – Increases in stormwater runoff during construction: Construction activities would temporarily modify existing land surfaces in the project area, which could result in short-term changes to stormwater runoff patterns, runoff quantity and quality, and surface water quality in the West Prong.

Issue – Increases in impervious surfaces and permanent removal of vegetation: Construction of new infrastructure and modification of existing infrastructure in the project area would create new impervious surfaces and result in permanent vegetation removal that could have long-term changes on stormwater runoff patterns, runoff quantity and quality, and surface water quality in the West Prong.

Issue – Increases in sedimentation and turbidity during instream work: Instream construction activities would temporarily modify the existing stream channel in the project area and result in short-term effects on the West Prong channel bed. Sediment disturbance in the West Prong would result in localized changes to turbidity levels in the water column.

Alternative 1 – No Action

Under the no action alternative, the Spur would retain its existing traffic patterns and road geometry. Impacts on surface waters, including water quality in the West Prong would not change from existing conditions.

Alternative 2 – NPS Preferred Alternative

As described in detail in the "Floodplains" section, corridor-wide improvements and intersection-specific improvements would occur in all three subareas. Ground disturbance and vegetation clearing of up to 11 acres across the project area during construction would temporarily increase stormwater runoff volume, soil erosion, and sediment transport, which may affect water quality in the West Prong. Potential impacts include intermittent and localized increases in turbidity, sediment loading, and nutrient (e.g., nitrogen and phosphorus) loading, primarily during heavy rain events. As outlined in chapter 2 under "Mitigation Measures," short-term impacts on water quality would be minimized during construction by implementing sediment and erosion control measures consistent with the requirements and recommendations contained in the *Tennessee Erosion and Sediment Control Handbook* (TDEC 2012). A Notice of Intent would be filed with TDEC to obtain coverage under the General NPDES Permit for Discharges of Stormwater Associated with Construction Activities (Permit Number TNR100000). A site-specific stormwater pollution prevention plan would be developed in accordance with Part 3 of the General Permit.

Instream work associated removal of the Wiley Oakley Bridge and relocation of existing utilities from the bridge to beneath the West Prong would also cause intermittent and localized increases in turbidity. After bridge removal and utility relocation are complete, the bottom of the river would be restored to natural or existing conditions with no long-term impacts on water quality. As outlined in chapter 2 under "Mitigation Measures," applicable permits from the US Army Corps of Engineers and TDEC would be obtained in accordance with sections 404 and 401 of Clean Water Act prior to conducting instream work.

Compliance with permit conditions and implementation of best management practices outlined in appendix 2 of NPS *Procedural Manual 77-1* (NPS 2016) would minimize potential impacts on surface waters. Utility lines would be encased in concrete beneath the river bottom to ensure durability.

In addition to temporary impacts during construction, removal of up to approximately 3 acres of forest vegetation and creation of new impervious surfaces would result in long-term changes to stormwater runoff patterns and runoff quantity and quality. Together, proposed improvements in the three subareas would contribute approximately 2 acres of new impervious surface in the project area. Construction of pull-offs, shoulder hardening, and curb and gutter treatments would result in approximately 1 acre of new impervious surfaces and alter stormwater drainage patterns. While new impervious surface would be added, the project would also remove approximately 1 acre of impervious surface associated with the bridge removal, resulting in a net increase of 1 acre.

To minimize long-term water quality impacts, the project design phase would include development of area-specific stormwater drainage plans and stormwater management practices to minimize potential water quality impacts from impervious surfaces and other permanent changes to stormwater drainage patterns. To the extent practicable, stormwater drainage infrastructure would be designed to treat, store, and infiltrate runoff on-site before reaching the West Prong. Examples of stormwater management practices that would be considered during design include grassed swales, infiltration basins, infiltration trenches, and bioretention (rain gardens). In addition, the project-specific revegetation plan outlined in the "Mitigation Measures" section would help minimize long-term impacts from stormwater runoff. Planned projects in the vicinity have the potential to increase impervious surfaces and associated stormwater runoff. The Gatlinburg Wastewater Treatment Plant upgrade and expansion is not expected to change water quality in the West Prong because pollutant loadings would not change. In consideration of these trends, alternative 2 is anticipated to minimally contribute new impervious surface adjacent to already paved areas along the Spur. Based on the relatively small area affected and proposed mitigation measures, long-term water quality impacts related to new impervious surfaces and permanent vegetation removal would be limited and not represent a noticeable change from existing conditions along the developed project area.

Alternative 3

Potential impacts on water quality under alternative 3 would be the same as those described for alternative 2 for corridor-wide improvements and subareas 1 and 2. As described in detail in the "Floodplains" section, at subarea 3, the construction of two contra-flow bridges would introduce additional infrastructure within the West Prong floodplain. Potential impacts on water quality due to instream water work would be the same as those described for alternative 2. Ground disturbance and vegetation clearing of up to 12.5 acres across the project area during construction would temporarily increase stormwater runoff volume, soil erosion, and sediment transport, which would affect water quality in the West Prong. In addition to temporary impacts during construction, removal of up to approximately 3.5 acres of forest vegetation and creation of new impervious surfaces would result in long-term changes to stormwater runoff patterns and runoff quantity and quality. Together, proposed improvements in the three subareas and corridor-wide improvements would contribute approximately 4.75 acres of new impervious surface in the project area under alternative 3. While new impervious surface would be added, the project would also remove approximately 1 acre of impervious surface associated with the road and bridge (figure 5), resulting in a net increase of 3.75 acres. Similar to alternative 2, alternative 3 would result in both short- and long-term impacts on water quality from the additional construction, but only minimal adverse impacts in the context of the 4.2-mile project area. The project design phase would include development of area-specific stormwater drainage plans and stormwater management practices to minimize potential water quality impacts from impervious surfaces and other permanent changes to stormwater drainage patterns. In consideration of the trends described under alternative 2, alternative 3 is anticipated to minimally contribute new impervious surface adjacent to already paved areas along the Spur.

Alternative 4

Impacts on water resources under alternative 4 would be the same as those described for alternative 2 for corridor-wide improvements and subareas 1 and 2. There would be no in-water work because the existing bridge at Wiley Oakley would remain. Ground disturbance and vegetation clearing of up to approximately 7.5 acres across the project area during construction would temporarily increase stormwater runoff volume, soil erosion, and sediment transport, which would affect water quality in the West Prong. In addition to temporary impacts during construction, removal of up to approximately 2.5 acres of forest vegetation and creation of new impervious surfaces would result in long-term changes to stormwater runoff quantity and quality. Together, the three subareas and corridor-wide improvements would contribute approximately 1.2 acres of new impervious surface in the project area under alternative 4. While new impervious surface would be added, the project would also remove approximately 1 acre of impervious surface associated with the bridge removal, resulting in a net increase of 1.5 acres. Similar to alternative 2, alternative 4 would result in both short- and long-term impacts on water quality from the additional construction, but only minimal adverse impacts in the context of the 4.2-mile project area. In consideration of the trends described under alternative 2, alternative 4 is anticipated to minimally contribute new impervious surface adjacent to already paved areas along the Spur.

CHAPTER 4: CONSULTATION AND COORDINATION

This "Consultation and Coordination" chapter describes the public involvement and agency consultation used during the preparation of the EA. A combination of activities, including internal scoping, has helped to guide NPS in developing this EA. This chapter provides a detailed list of the various consultations initiated during the development of the EA, as well as a list of recipients for this document.

Public Participation and Scoping

The Civic Engagement and Scoping Process

Civic engagement and scoping are essential components of the NEPA planning process. The formal scoping process for this EA consisted of public scoping and consultation with federal and state agencies and tribal governments. Public engagement began in April 2020 with a civic engagement comment period for four transportation and access projects in the Tennessee portion of the Park, including the proposed action in this EA. The formal NEPA process and 30-day public scoping period was initiated on August 27, 2021, with the press release announcing the public scoping period and a newsletter release to Park stakeholders, partners, and adjacent property owners. During the public scoping period, NPS received 64 pieces of correspondence.

Public Comment

The EA will be available for formal public and agency review for 30 days. Interested individuals, agencies, and organizations will be notified of its availability. The EA will be available for public review on the NPS Planning, Environment, and Public Comment website https://parkplanning.nps.gov/SpurImprovements.

Agency Consultation

Endangered Species Act Section 7 Consultation

In accordance with section 7 of the Endangered Species Act, NPS initiated informal consultation with US Fish and Wildlife Service and has requested concurrence from the Service that the preferred alternative may affect but is not likely to adversely affect Indiana bats and northern long-eared bats. The Park will complete the section 7 consultation process prior to finalizing the NPS decision document for this EA.

National Historic Preservation Act Section 106 and Tribal Consultation

The National Historic Preservation Act section 106 consultation process was initiated with the Tennessee state historic preservation officer (SHPO). NPS provided the draft area of potential effect and survey methodology on December 15, 2020. On December 18, 2020, the Tennessee SHPO concurred with the proposed area of potential effect and survey methodology. The Phase I Survey report and associated assessment of effect will be submitted to the Tennessee SHPO. The Park will complete the section 106 consultation process prior to finalizing the NPS decision document for this EA.

Letters were also sent to four Native American Tribes on December 15, 2020, with the draft area of potential effect and survey methodology. These tribes included: Eastern Band of the Cherokee Indians, Cherokee Nation, United Keetoowah Band of Cherokee Indians in Oklahoma, and Chickasaw Nation. No responses were received.

Based on findings of the archeological survey and no long-term impacts on potentially eligible National Register sites, NPS has made a preliminary determination that the preferred alternative (alternative 2) would have no adverse effect on archeological resources. For aboveground historic resources, the Foothills Parkway itself, including the Spur, has been evaluated for eligibility and was recommended not eligible for listing on the National Register (NPS 2015b). As noted in chapter 2, one aboveground historic resource, Perry's Camp, was identified outside the project area but in the vicinity of the intersection improvements at subarea 2. Because of the heavily wooded and mountainous terrain, the construction of an acceleration lane on the southbound Spur would not have a direct effect on the resource or alter its viewshed. Temporary construction noise would occur but would not result in any permanent impact on the resource.

A final determination of effect is pending completion of the section 106 process, including consideration of any public comments on this EA and ongoing consultation with Tennessee SHPO and traditionally associated Native American Tribes. The park will complete the section 106 consultation process prior to finalizing the NPS decision document for this EA. Furthermore, if additional information on ethnographic resources or traditional uses is provided by the Tribes, the Park will work with concerned parties to resolve any potential impacts associated with the proposed action.

CHAPTER 5: LIST OF PREPARERS

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CHAPTER 6: ACRONYMS AND ABBREVIATIONS

CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	environmental assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
HUC	Hydrologic Unit Code
LOS	level of service
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
National Register	National Register of Historic Places
Park	Great Smoky Mountains National Park
Parkway	Foothills Parkway
SF	square feet
SHPO	state historic preservation office
Spur	Gatlinburg Spur
TDEC	Tennessee Department of Environment and Conservation
USC	United States Code
West Prong	West Prong of the Little Pigeon River

CHAPTER 7: REFERENCES

Council on Environmental Quality (CEQ)

2014 *Memorandum for Heads of Federal Departments and Agencies: Effective Use of Programmatic NEPA Reviews*. Executive Office of the President Council on Environmental Quality. December 18, 2014.

Federal Emergency Management Administration (FEMA)

2019 Flood Map Service Center. Flood Map 47155C0244E. Effective May 18, 2019.

2020 Flood Zones. Accessed August 31, 2020. https://www.fema.gov/glossary/flood-zones

Federal Highway Administration (FHWA)

2011 *Context Sensitive Rock Slope Design Solutions*. Prepared by Yeh and Associates, Inc. January 2011. https://www.fhwa.dot.gov/clas/ctip/context_sensitive_rock_slope_design/default.aspx#toc

2019 Traffic Study within the Gatlinburg Spur Corridor of Great Smoky Mountains National Park. Final Report June 2019. Prepared by Kimley Horn.

National Park Service (NPS)

1968 *Foothills Parkway Master Plan.*

1982 Final Environmental Impact Statement General Management Plan. Great Smoky Mountains National Park. January.

1992 National Register of Historic Places Registration Form. Perry's Camp, Sevier County, Tennessee. Accessed April 27, 2022. https://npgallery.nps.gov/getasset/6d33e51d-e40a-485a-a70d-b5cfbf3f6357/index.htm

1994 Draft Environmental Impact Statement, Foothills Parkway Section 8D. Foothills Parkway – Great Smoky Mountains National Park.

2006 *Management Policies.* US Department of the Interior, National Park Service, Washington, DC.

2012 Acidic Rock Formations Map. Great Smoky Mountains National Park GIS Lab. November 26.

2015a *National Park Service NEPA Handbook*. http://www.nps.gov/applications/npspolicy/DOrders.cfm

2015b NPS Great Smoky Mountains National Park Historic Resource Survey.

2016 *National Park Service Procedural Manual #77-1: Wetland Protection*.

2019 Traffic Study within the Gatlinburg Spur Corridor of the Great Smoky Mountains National Park.

2021 Spring Botanical Survey Report for the Gatlinburg Spur Safety Improvements and Greenway Project. June 2021. Prepared by AllStar Ecology LLC.

2022 Annual Park Recreation Visitation. https://irma.nps.gov/STATS/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20(1904%20-%20Last%20Calendar%20Year)?Park=GRSM

National Water Quality Monitoring Council (NWQMC)

2021 West Prong Little Pigeon River at Sevierville, Tennessee, site data in the Water Quality Portal. Accessed September 29, 2021. https://www.waterqualitydata.us/provider/NWIS/USGS-TN/USGS-03469900/

Tennessee Department of Environment and Conservation (TDEC)

n.d. "Aquatic Resource Alteration Permit" https://www.tn.gov/environment/permit-permits/water-permits1/aquatic-resource-alteration-permit--arap-.html

2012 *Tennessee Erosion and Sediment Control Handbook: A Stormwater Planning and Design Manual for Construction Activities*. Fourth Edition. August 2012. https://tnepsc.org/TDEC_EandS_Handbook_2012_Edition4/TDEC%20EandS%20Handbook%204th%20Edition.pdf

2021a *Water Quality Rules, Reports, and Publications*. Accessed October 26, 2021. https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/water-quality-reports---publications.html

2021b 2021 General Construction Permit (CGP). Issued on September 27, 2021, effective October 1, 2021. https://tnstormwatertraining.org/index.asp

Tennessee Department of Transportation (TDOT)

2021 2021 Traffic Map – Sevier County, Tennessee. https://www.tn.gov/content/dam/tn/tdot/maps/2021-traffic-maps-with-aadt/SevierCounty2021Combined.pdf

US Census Bureau

2019 Annual Estimates of the Resident Population, Table ID PEPANNRES, Sevier County, 2010-2019, United States Census. https://data.census.gov/cedsci/table?q=&t=Populations%20and%20People&g=0500000US47155&tid=PEPPOP2019.PEPANNRES

US Environmental Protection Agency (USEPA)

2021a "Water Quality Standards Regulations: Tennessee." Accessed January 13, 2022. https://www.epa.gov/wqs-tech/water-quality-standards-regulations-tennessee

2021b *How's My Waterway? Tennessee Water Quality Overview*. Accessed October 26, 2021. https://mywaterway.epa.gov/state/TN/water-quality-overview

2022 How's My Waterway? Waterbody Report – West Prong Little Pigeon River – Assessment Unit ID: TN06010107010_2000. Accessed April 22, 2022. https://mywaterway.epa.gov/waterbody-report/TDECWR/TN06010107010_2000

US Fish and Wildlife Service (USFWS)

2007 *National Bald Eagle Management Guidelines*. Accessed August 15, 2021. https://www.fws.gov/migratorybirds/pdf/management/nationalbaldeaglenanagementguidelines.pdf

United States Geological Survey (USGS)

2021 National Land Cover Database. Accessed January 14, 2022. https://www.usgs.gov/centers/eros/science/national-land-cover-database

2022 National Water Information System. 03469251 West Prong Little Pigeon River near Gatlinburg, TN. Accessed January 14, 2022. https://waterdata.usgs.gov/nwis/inventory/?site_no=03469251&agency_cd=USGS

APPENDIX A: 2019 TRAFFIC STUDY SUMMARY

2019 Traffic Study Summary

Traffic congestion is commonly measured through the relationship between traffic volume and roadway capacity that is typically expressed through level of service (LOS). The LOS designation is a professional industry standard used to describe the measured operating conditions of a roadway segment or intersection. LOS is defined on a scale of A to F to describe the range of operating conditions for a roadway facility. LOS A and LOS B indicate free flow travel. LOS C indicates stable traffic flow. LOS D indicates the beginning of traffic congestion. LOS E indicates the nearing of traffic breakdown conditions, and LOS F indicates stop-and-go traffic conditions. For the purposes of this analysis, LOS D or better is considered acceptable, and LOS E and F are considered unacceptable or intersection failures. A graphic depiction of LOS is provided in figure A-1. This appendix provides a summary of the 2019 traffic study for the Gatlinburg Spur completed by Federal Highway Administration – Eastern Federal Lands Division and Great Smoky Mountains National Park. For this study, LOS was measured during AM (morning) and PM (afternoon/evening) peak hours during peak and non-peak seasons. AM and PM peak hours during the peak season were determined to be 10:45 AM to 11:45 AM and 2:45 PM to 3:45 PM, respectively. AM and PM peak hours during the non-peak season were determined to be 11:00 AM to 12:00 PM and 4:15 PM to 5:15 PM, respectively.

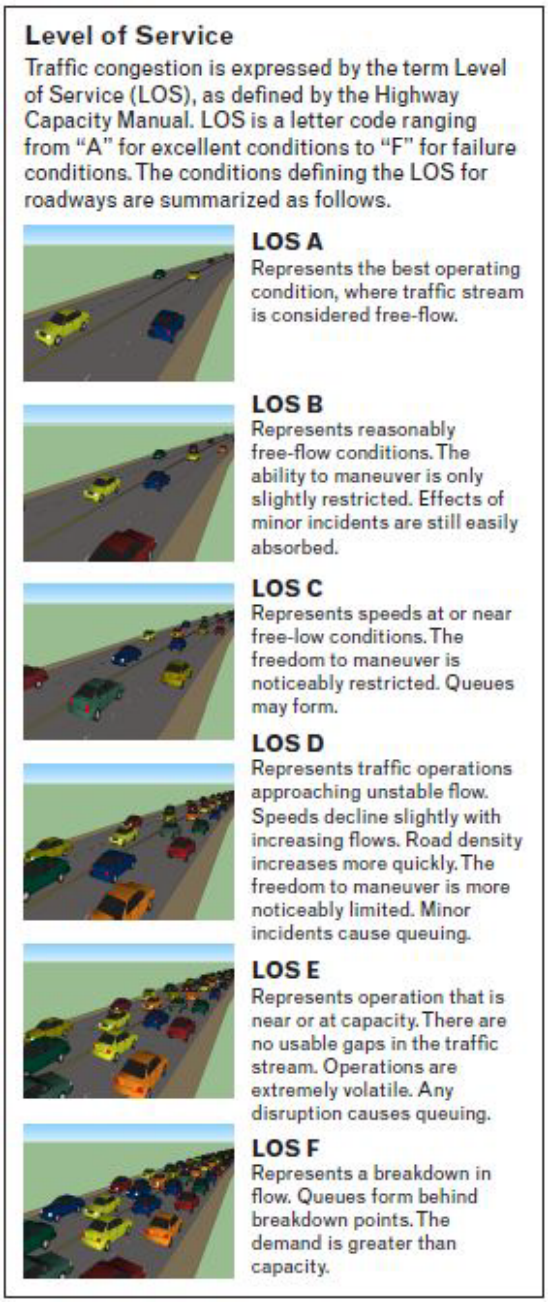

FIGURE A-1: LEVEL OF SERVICE

BASELINE CONDITIONS

Existing traffic volumes were obtained from a traffic study completed in June 2019. In support of the 2019 report, traffic data were collected in 2017, which represents the baseline conditions for this analysis. Twelve-hour video turning movement counts were collected during the traffic study for one typical weekday and both weekend days at each of the three subarea intersections during the peak and non-peak seasons. Twenty-four-hour traffic counts and speed data were also collected along the Spur for seven days during peak and non-peaks seasons. Recorded count and speed monitoring data were gathered at the three

subareas. Saturday resulted in the highest volumes and was chosen as the peak day for purposes of the analysis.

The baseline conditions include the 4.2-mile portion of the Spur. In addition to corridor-wide improvements, three intersection subareas lie within the study area, each intersecting with the Spur:

1. Gum Stand Road/King Branch Road
2. Huskey Grove Road/Flat Branch Road
3. Wiley Oakley Drive

These three subareas include intersecting roadways that connect to the northbound and southbound lanes of the Spur through unsignalized intersections. These intersections also permit turnaround movements between the northbound and southbound lanes of the Spur. The corridor experiences a noticeable increase in traffic volumes during the Park's peak spring, summer, and fall visitation seasons, and traffic volumes fluctuate daily due to local commuter travel patterns. Traffic volumes in the study area vary significantly depending on the season due to the Park's and the gateway communities' visitation.

Currently, subareas 1 and 2 operate within acceptable LOS during both AM and PM peak hours during the peak season, while subarea 3 operates with an unacceptable LOS. Subarea 3 has three movements during the AM peak hour and four movements during the PM peak hour operating at a LOS F. Several of these movements operate with a delay of longer than one minute and a queue longer than 100 feet, assuming approximately 20 feet per vehicle. Failing turning movements during either the AM or PM peak hours include:

1. Eastbound Through – crossing the southbound Spur from the welcome center toward the bridge
2. Westbound Left-Through – along the bridge to the southbound Spur and the welcome center
3. Eastbound Left-Through – along the bridge to the northbound Spur and Westgate Resorts Road
4. Westbound Through-Right – crossing the northbound Spur toward the bridge and turning right onto the northbound Spur from Westgate Resorts Road

In general, traffic congestion at subarea 3 is noticeable, and accidents can be frequent. Specific LOS, delay, and queuing detail for all turning movements are provided in table A-1 and figures A-2 through A-4.

TABLE A-1: INTERSECTIONS 2017 EXISTING PEAK TRAFFIC CONDITIONS

Subarea	Direction	AM Peak Hour			PM Peak Hour		
		Delay (sec)	LOS	Queue (ft)	Delay (sec)	LOS	Queue (ft)
1 – Gum Stand Rd/ King Branch Road	Westbound Left	29.6	D	36	16.5	C	9
	Southbound Left	7.4	A	5	7.4	A	5
	Eastbound Left	17.9	C	25	23	C	36
	Northbound Left	7.3	A	3	7.3	A	2
	Westbound Right (North)	22.6	C	51	32.9	D	39
	Westbound Right (South)	17.3	C	0	23.2	C	6
	Westbound Left-Through	4.7	A	1	5.2	A	1
	Northbound Left-Right	9.2	A	2	9.4	A	3
2 – Huskey Grove Road/ Flat Branch Road	Eastbound Right	29.7	D	14	16.6	C	6
	Eastbound Left-Right	8.7	A	2	8.7	A	2
	Northbound Left-Through	4.0	A	0	2.2	A	0
	Eastbound Left-Right	8.7	A	2	8.7	A	2
	Northbound Left-Through	4.6	A	0	2.4	A	0
	Westbound Left	8.7	A	2	8.7	A	2
3 – Wiley Oakley Drive	Westbound Left-Right	9.2	A	13	8.9	A	7
	Southbound Left-Right	9.5	A	11	9.3	A	6
	Eastbound Left-Through	0.2	A	0	0.1	A	0
	Eastbound Through	171.4	F	63	52.2	F	38
	Eastbound Right	30.7	D	50	16.8	C	20
	Westbound Left-Through	876.6	F	275	120.1	F	153
	Eastbound Left-Through	81.6	F	113	830.9	F	315
	Westbound Through-Right	31.2	D	38	129.5	F	100

Subarea	Direction	AM Peak Hour			PM Peak Hour		
		Delay (sec)	LOS	Queue (ft)	Delay (sec)	LOS	Queue (ft)
	Eastbound Left-Through-Right	6.9	A	-	7.0	A	-
	Northbound Through-Right	7.4	A	-	7.4	A	-
	Southbound Left-Through	7.4	A	-	7.4	A	-

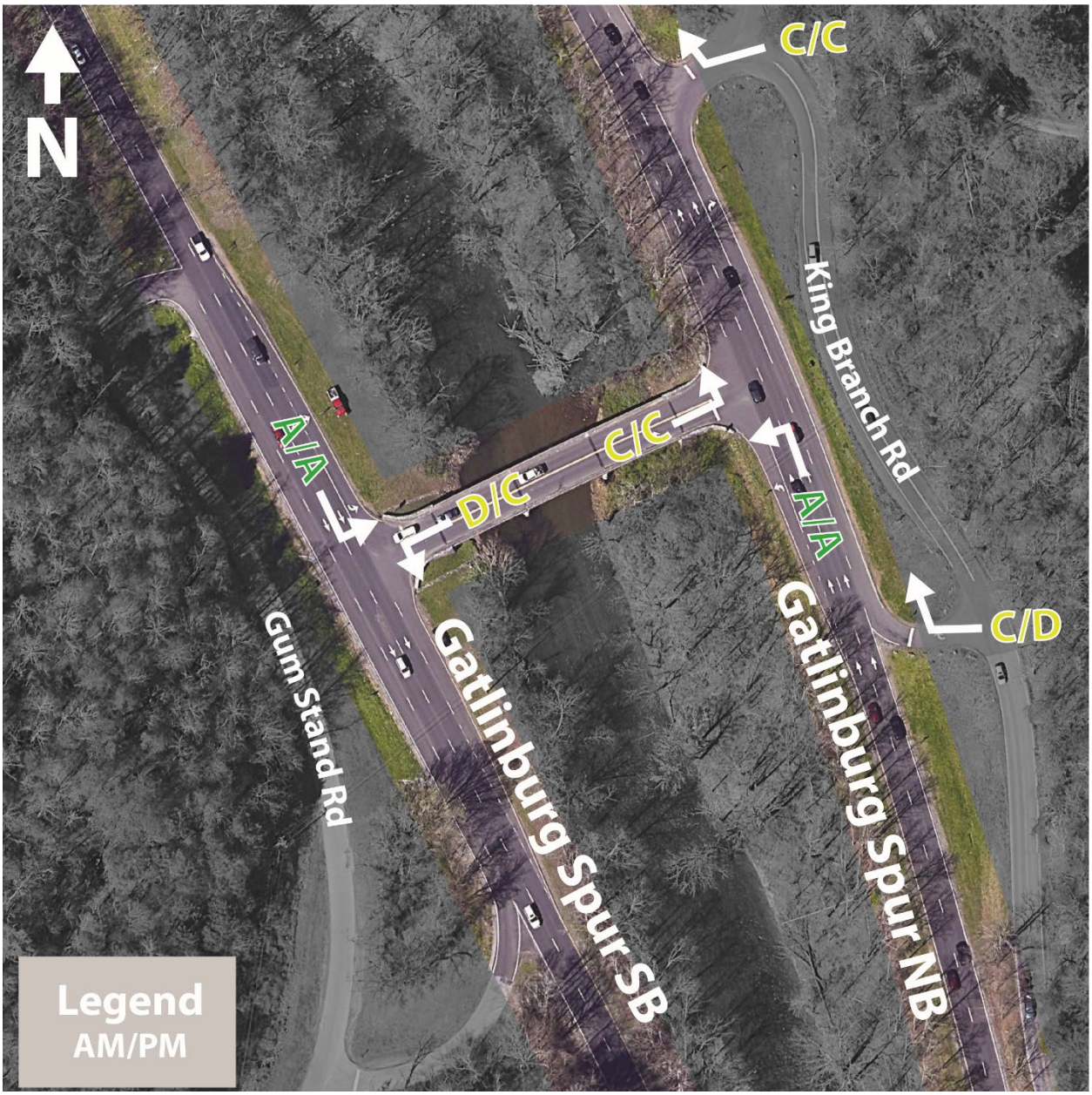

FIGURE A-2: SUBAREA 1 EXISTING LEVEL OF SERVICE

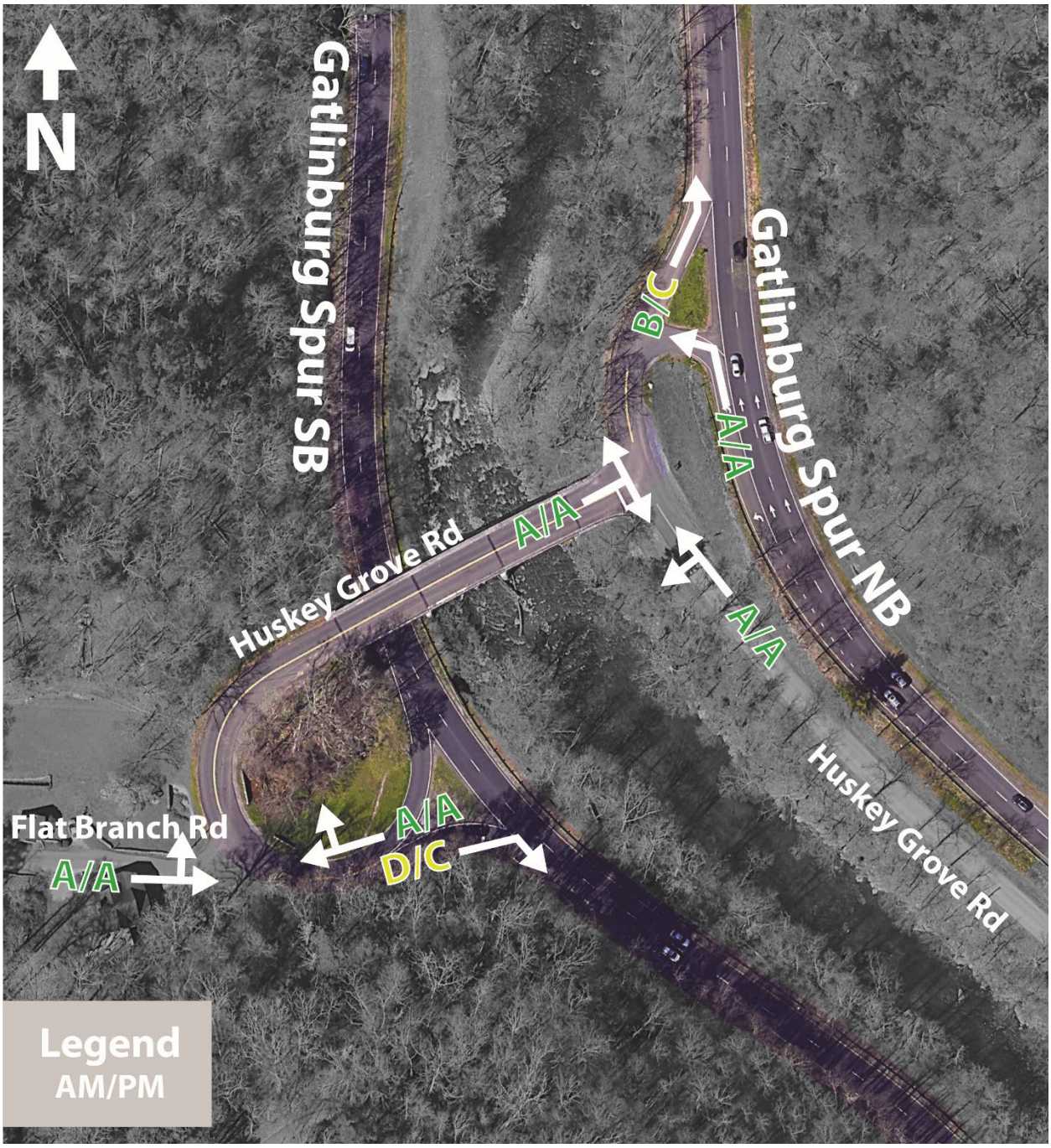

FIGURE A-3: SUBAREA 2 EXISTING LEVEL OF SERVICE

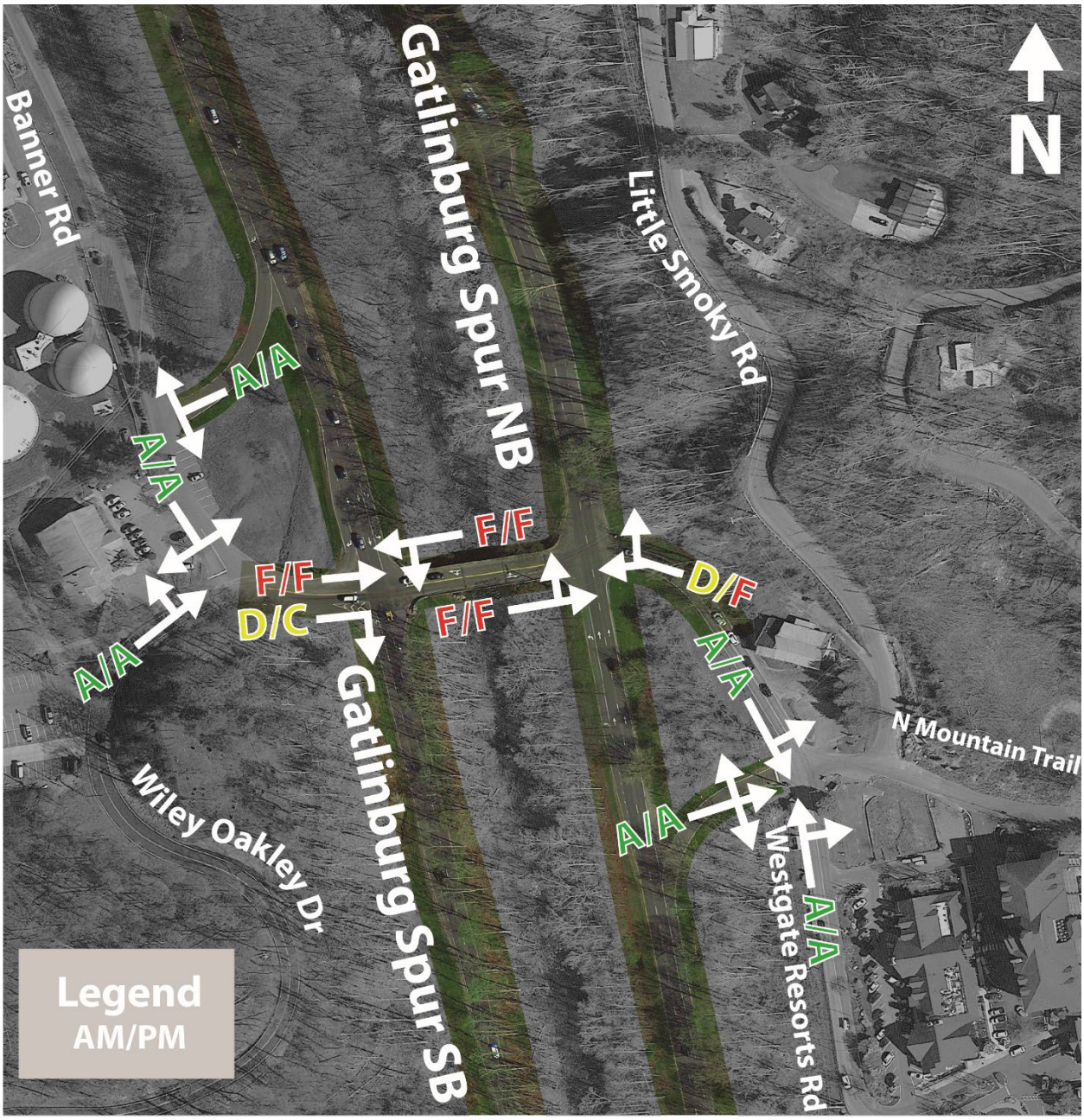

FIGURE A-4: SUBAREA 3 EXISTING LEVEL OF SERVICE

The 2019 traffic study also evaluated the corridor in both directions in two segments:

1. North from Huskey Grove Road (subarea 2/northern end of tunnel) to Pigeon Forge
2. South from Huskey Grove Road (subarea 2) to Gatlinburg Bypass

The corridor was evaluated in passenger cars per mile per lane (pc/mi/ln). The density of vehicles along the Spur is higher during the AM peak hour in the southbound direction and during the PM peak hour in the northbound direction, indicating traffic travels toward Gatlinburg and the Park in the morning and away from Gatlinburg in the evening. Both segments operate with acceptable LOS in both directions during both peak hours, as shown in table A-2.

TABLE A-2: SPUR CORRIDOR EXISTING PEAK TRAFFIC CONDITIONS (2017)–AVERAGE DENSITY

Analysis Segment	Northbound		Southbound	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
North from Huskey Grove Road	17.7 (B)	25.1 (C)	25.4 (C)	16.4 (B)
South from Huskey Grove Road	15.7 (B)	21.7 (C)	21.3 (C)	15.1 (B)

DENSITY IS IN PC/MI/IN

FUTURE CONDITIONS

Alternative 1 - No Action

Under alternative 1, no action would be taken, and traffic volumes are expected to increase by 1.5 percent annually. For purposes of this analysis, traffic volumes were forecasted for the year 2037 to analyze future traffic conditions. Alternative 1 assumes no roadway improvements occur over this period.

Under alternative 1, all subareas would have at least one turning movement operating with an unacceptable LOS. When the analysis calculations reach an exceptionally high value, traffic flow is well beyond stable, and the analysis does not report delays and queues because they can reach unrealistically high levels; instead, the analysis reports the movement as "Error" because they are so over capacity that they cannot reasonably be compared to other movements. Delays at subarea 3, which already experiences unacceptable LOS during existing conditions, would increase to more than 20 times the delay for some movements under future conditions. Some movements experienced such considerable delays that they were recorded as "Error" in the traffic analysis software.

The following movements operated with unacceptable levels of service during either the AM or PM peak hour:

Subarea 1

1. Westbound Left – along the bridge to the southbound Spur
2. Westbound Right (north) – from Gnatty Branch Road to the northbound Spur, north of the bridge
3. Eastbound Left – along the bridge to the northbound Spur
4. Westbound Right (south) – from King Branch Road to the northbound Spur, south of the bridge

Subarea 2

1. Eastbound Right – from Flat Branch Road/Huskey Grove Road to the southbound Spur

Subarea 3

2. Eastbound Through – crossing the southbound Spur from the welcome center toward the bridge
3. Eastbound Right – turning right from Wiley Oakley Drive at the welcome center onto the southbound Spur
4. Westbound Left-Through – along the bridge to the southbound Spur and the welcome center
5. Eastbound Left-Through – along the bridge to the northbound Spur and Westgate Resorts Road
6. Westbound Through-Right – crossing the northbound Spur toward the bridge and turning right onto the northbound Spur from Westgate Resorts Road

Specific LOS, delay, and queuing detail for all turning movements is provided in table A-3 and figures A-5 through A-7.

TABLE A-3: INTERSECTIONS PEAK TRAFFIC CONDITIONS (ALTERNATIVE 1)

Subarea	Direction	AM Peak Hour			PM Peak Hour		
		Delay (sec)	LOS	Queue (ft)	Delay (sec)	LOS	Queue (ft)
1 – Gum Stand Rd/ King Branch Road	Westbound Left	115.3	F	127	26.2	D	20
	Southbound Left	7.4	A	7	7.4	A	6
	Eastbound Left	29.8	D	58	59.7	F	107
	Northbound Left	7.4	A	4	7.3	A	2
	Westbound Right (North)	66.1	F	159	142	F	136
	Westbound Right (South)	25.9	D	16	44.3	E	17
	Westbound Left-Through	4.7	A	2	5.1	A	1
	Northbound Left-Right	9.5	A	2	9.7	A	4
2 – Huskey Grove Road/ Flat Branch Road	Eastbound Right	87.9	F	47	28.3	D	14
	Eastbound Left-Right	8.7	A	3	8.8	A	2
	Northbound Left-Through	4.4	A	0	2.2	A	0
	Eastbound Left-Right	8.8	A	2	8.8	A	3
	Northbound Left-Through	4.0	A	0	2.3	A	0
	Westbound Left	8.8	A	2	8.8	A	3
3 – Wiley Oakley Drive	Westbound Left-Right	9.5	A	18	9	A	10
	Southbound Left-Right	10.0	A	16	9.6	A	8
	Eastbound Left-Through	0.2	A	0	0.1	A	0
	Eastbound Through	2320.2	F	155	556.1	F	150
	Eastbound Right	154.4	F	185	31.2	D	55
	Westbound Left-Through	Error	F	-	Error	F	-
	Eastbound Left-Through	Error	F	-	Error	F	-
	Westbound Through-Right	334.7	F	343	3052.5	F	915
	Eastbound Left-Through-Right	7.8	A	-	8.4	A	-
	Northbound Through-Right	8.8	A	-	10.7	A	-
	Southbound Left-Through	8.7	A	-	9.3	A	-

The corridor would also operate with unacceptable LOS during the AM peak hour southbound and PM peak hour northbound, as shown in table A-4.

TABLE A-4: CORRIDOR PEAK TRAFFIC CONDITIONS (ALTERNATIVE 1)–AVERAGE DENSITY

Analysis Segment	Northbound		Southbound	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
North from Huskey Grove Road	23.8 (C)	36.1 (E)	42.3 (E)	24.4 (C)
South from Huskey Grove Road	21.0 (C)	29.5 (D)	30.0 (D)	21.3 (C)

DENSITY IS IN PC/MI/LN

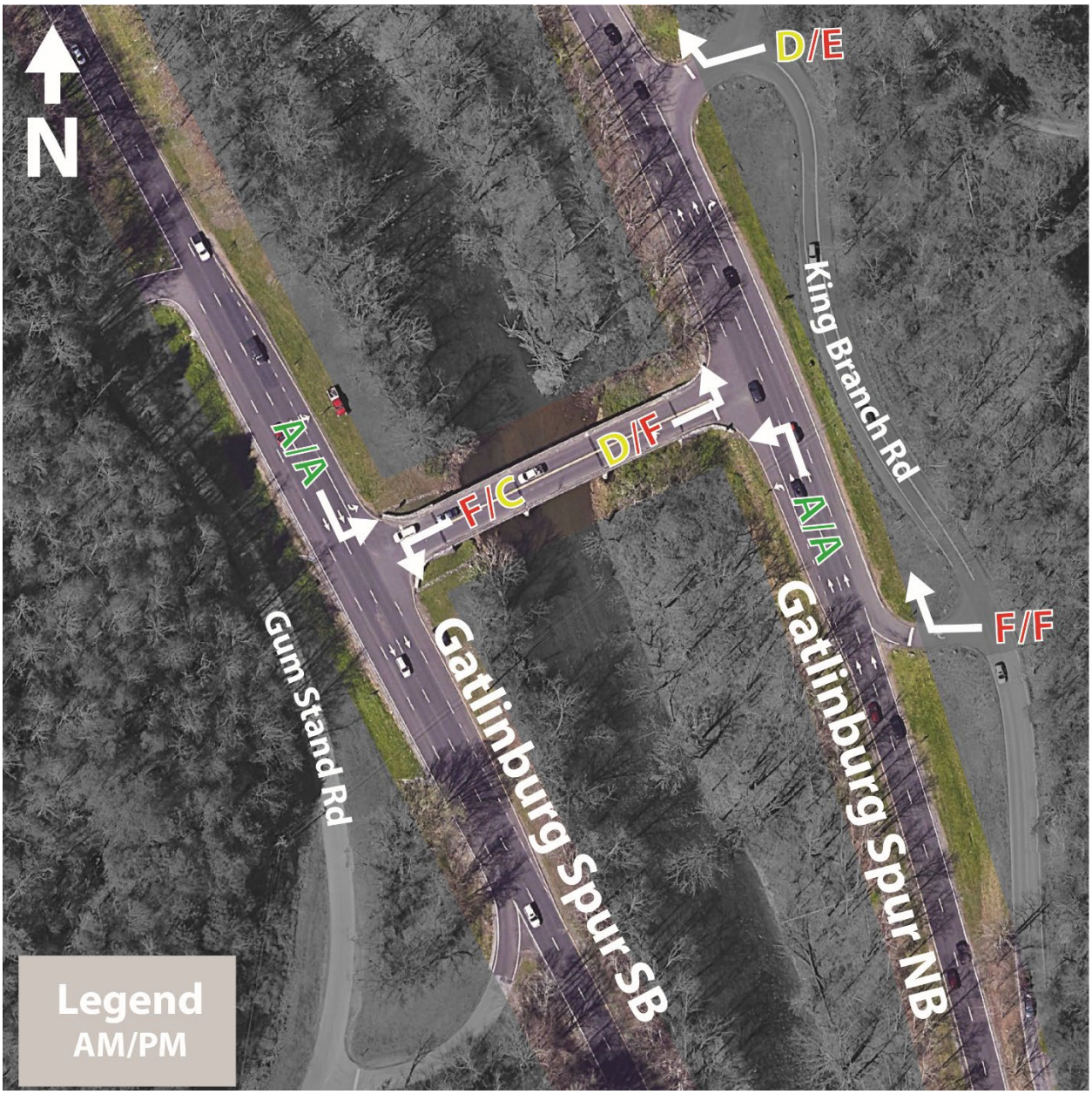

FIGURE A-5: SUBAREA 1 LEVEL OF SERVICE–ALTERNATIVE 1 (2037)

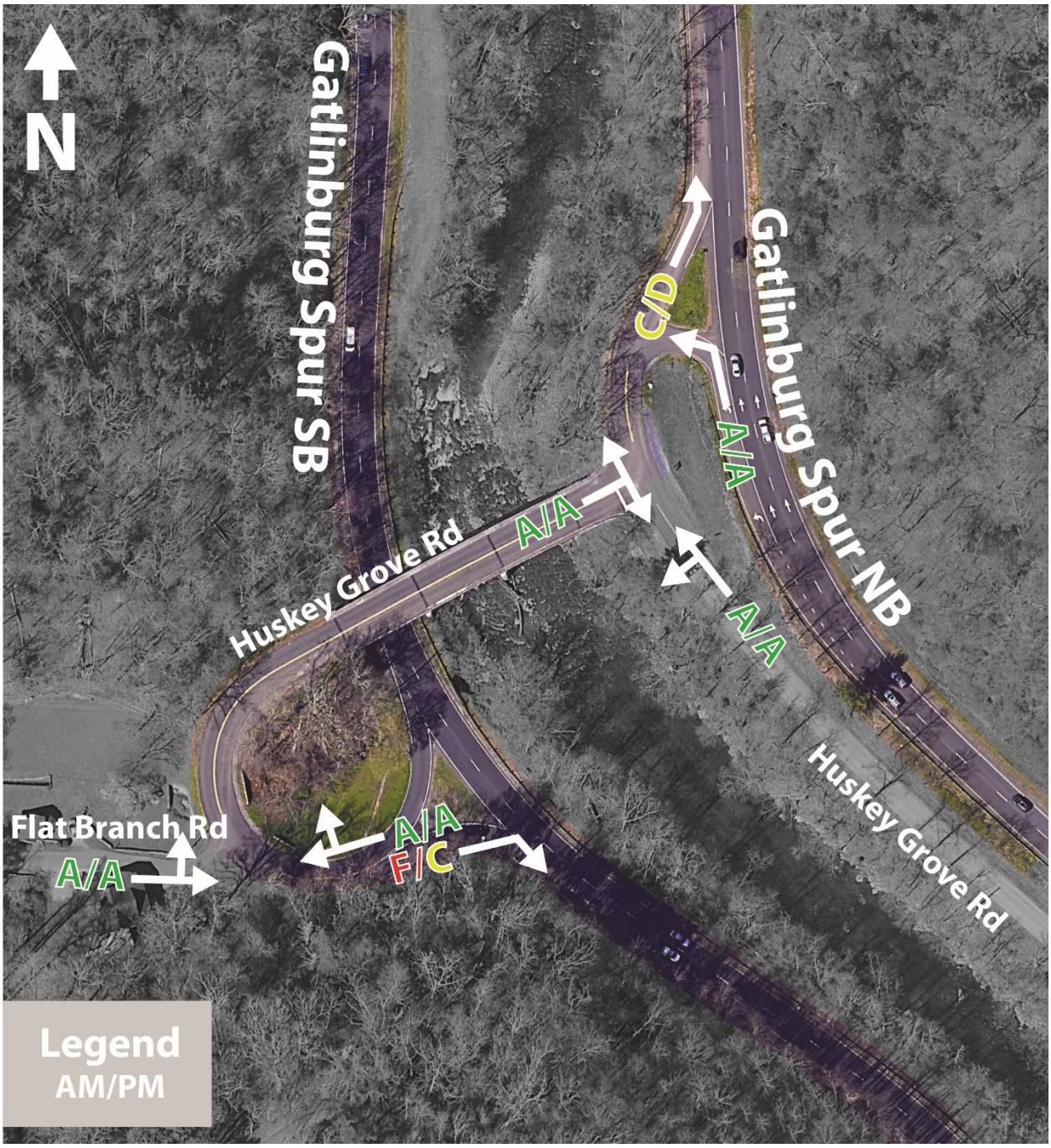

FIGURE A-6: SUBAREA 2 LEVEL OF SERVICE–ALTERNATIVE 1 (2037)

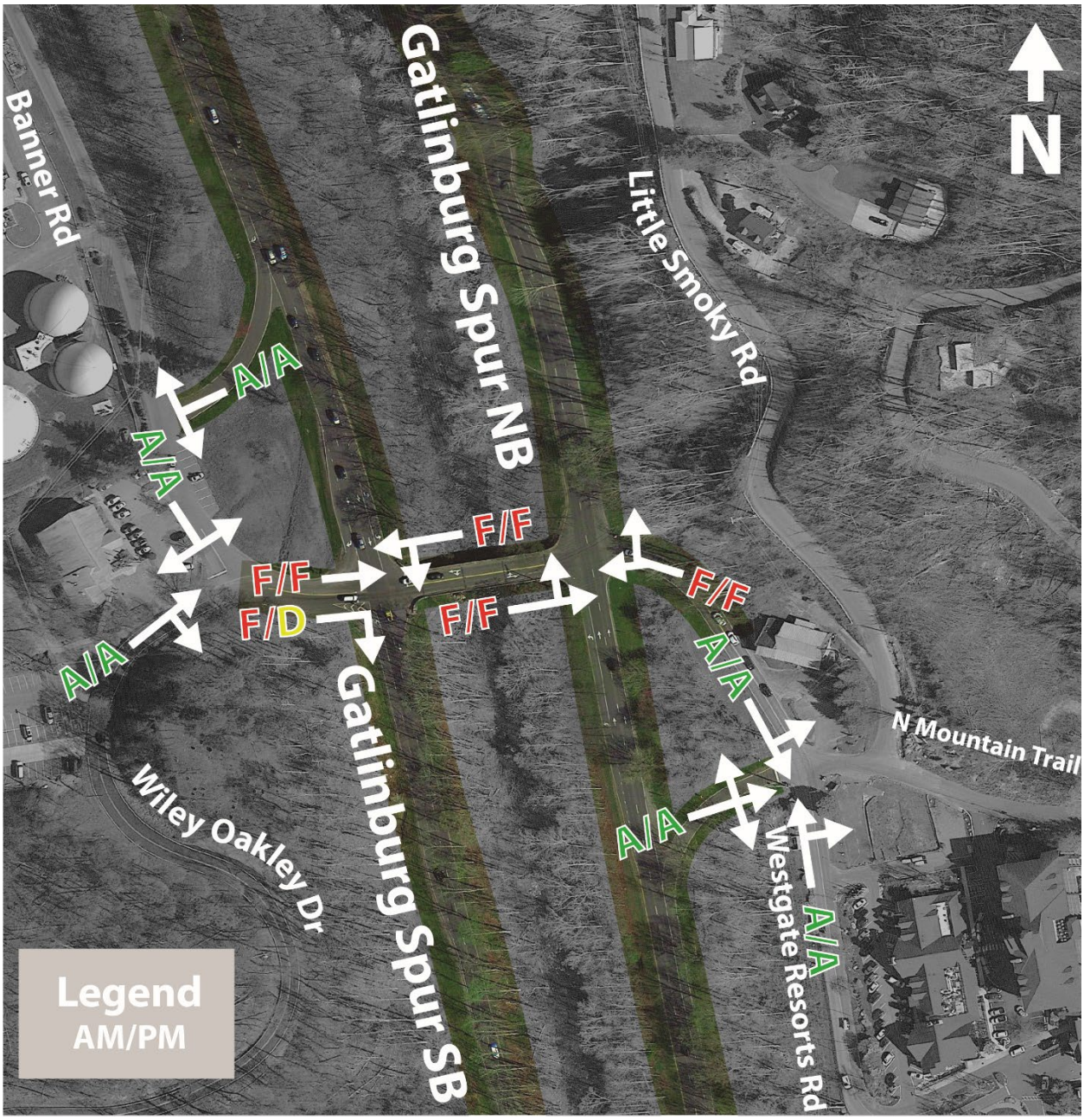

FIGURE A-7: SUBAREA 3 LEVEL OF SERVICE–ALTERNATIVE 1 (2037)

Overall, alternative 1 would increase congestion and queuing delays at the key intersections along the Spur because the roadway is projected to operate at LOS E. All three subareas would experience at least one turning movement with LOS F, including subareas 1 and 2, which currently do not have any turning movement failures. The congestion at subarea 3 (Wiley Oakley Drive) would increase to unacceptable delays that exceed the capacity of the roadway. Due to increased congestion, traffic delays and crashes are also anticipated to increase. Overall density of traffic on the Spur would increase but would not result in LOS failure during peak periods.

Alternative 2

Under alternative 2, NPS would improve traffic circulation at each of the three subareas including implementing contra-flow conditions at subarea 1, extending acceleration lanes at subarea 2, and constructing a flyover bridge at subarea 3. Like alternative 1, traffic volumes are expected to increase by 1.5 percent annually, and traffic volumes were forecasted for the year 2037 to analyze future traffic conditions.

Under alternative 2 at subarea 1, only turning movements on the bridge would be affected. Turning movements entering the Spur from King Branch Road and Gnatty Branch Road would be the same as those described under alternative 1. Compared to alternative 1, the westbound and eastbound left turns from the bridge to the southbound and northbound Spur, respectively, would improve one letter grade for both AM and PM peak hours by implementing a contra-flow circulation pattern (table A-5 and figure A-8). The delay for the westbound left from the bridge to the southbound Spur during the AM peak hour would improve from 115.3 seconds to 38.2 seconds, and the eastbound left from the bridge to the northbound Spur during the PM peak hour would improve from 59.7 seconds to 38.8 seconds. This latter movement remains with an unacceptable delay (LOS E) but would result in a beneficial impact on the traffic network at this location.

At subarea 2, the impact of extending the acceleration lanes could not be determined using the traffic analysis because the software does not consider acceleration lane length. While there may not be a measurable impact on traffic congestion, extending the acceleration lanes would result in long-term, beneficial impacts on safety because extra space would be provided for accelerating onto the high-speed corridor from the low-speed ramp. This extension would allow vehicles additional time to increase their speed to meet the flow of traffic while increasing their line of sight to merge into traffic, resulting in beneficial impacts.

At subarea 3, all turning movements would operate with an acceptable LOS under alternative 2. Under alternative 2, the construction of a flyover bridge would eliminate vehicles from crossing multiple travel lanes of the Spur at grade both northbound and southbound. Vehicle movements across the at-grade bridge are the source of the capacity failures under alternative 1 (see figure A-7). Replacing an at-grade crossing with a grade-separated flyover bridge would improve traffic flow to LOS C or better for both AM and PM peak hours while reducing the potential for vehicle collisions, which would result in long-term-, beneficial impacts on traffic and safety (table A-5 and figure A-9).

TABLE A-5: INTERSECTION PEAK TRAFFIC CONDITIONS (ALTERNATIVE 2)

Subarea	Direction	Alternative 1				Alternative 2			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1 – Gum Stand Rd/ King Branch Road	Westbound Left	115.3	F	26.2	D	38.2	E	17.4	C
	Eastbound Left	29.8	D	59.7	F	19.8	C	38.8	E

Subarea	Direction	Alternative 1				Alternative 2			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
2 – Huskey Grove Road/Flat Branch Road	All	-	NA	-	NA	-	NA	-	NA
3 – Wiley Oakley Drive	Westbound Left-Right (Spur SB off-ramp at Banner Rd)	9.5	A	9	A	16.1	C	13.5	B
	Northbound Through (NB on Banner Rd at new bridge)	-	-	-	-	11.3	B	9.3	A
	Southbound Left-Through (ramp from Spur southbound at new bridge)	-	-	-	-	4.2	A	5.1	A
	Westbound Left-Right (exiting new bridge at Banner Rd)	-	-	-	-	1.6	A	1.4	A
	Eastbound Left-Through-Right (NB Spur off-ramp at Westgate Resorts Rd EB)	7.8	A	8.4	A	9.7	A	12.1	B
	Westbound Left-Through-Right (NB Spur off-ramp at Westgate Resorts Rd WB)	-	-	-	-	8.6	A	9.6	A
	Northbound Left-Through-Right (NB Spur off-ramp at Westgate Resorts Rd NB)	8.8	A	10.7	A	9.8	A	13.7	B
	Southbound Left-Through-Right (NB Spur off-ramp at Westgate Resorts Rd SB)	8.7	A	9.3	A	10.1	B	12	B

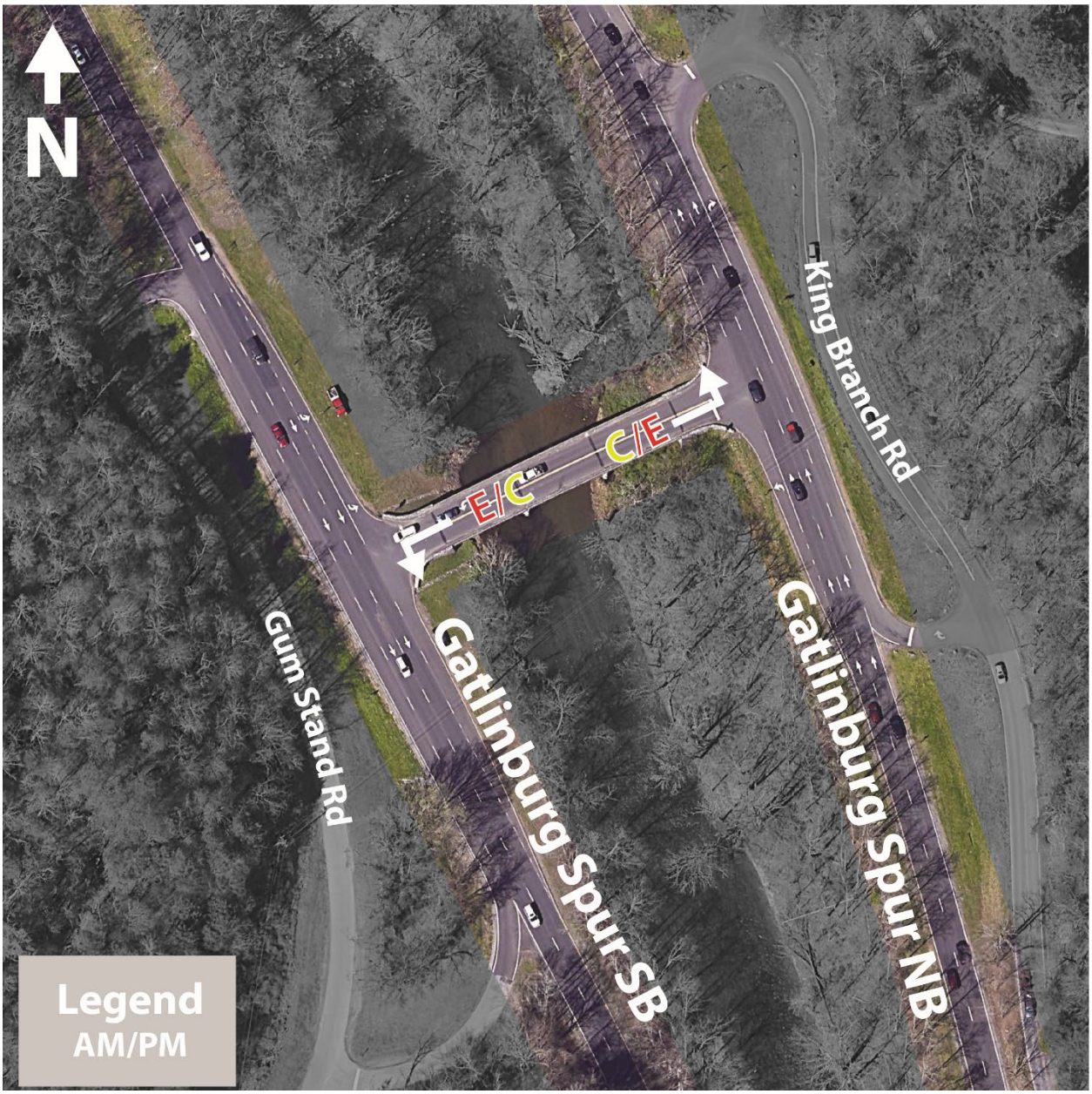

FIGURE A-8: SUBAREA 1 LEVEL OF SERVICE–ALTERNATIVE 2 (2037)

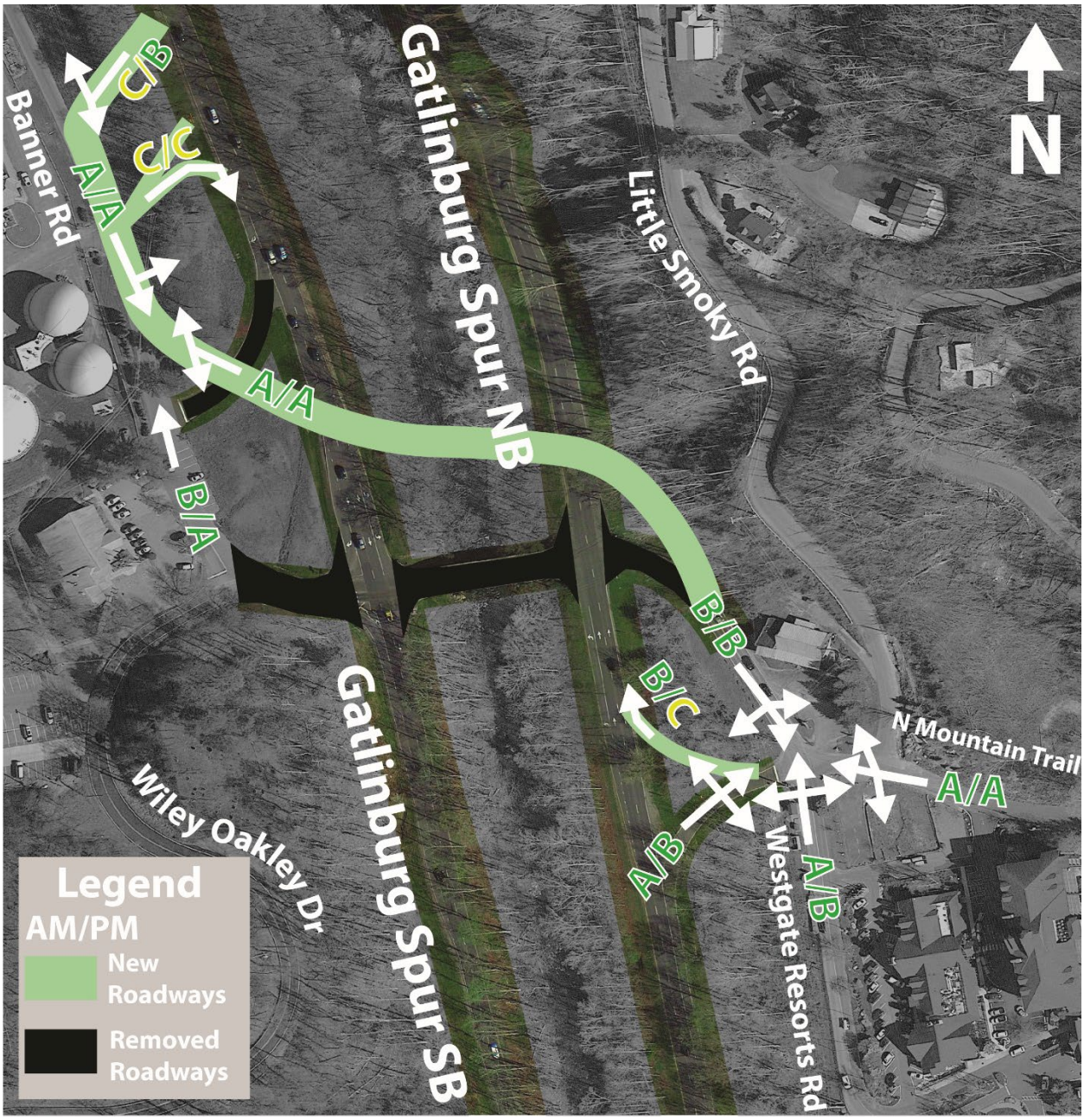

FIGURE A-9: SUBAREA 3 LEVEL OF SERVICE–ALTERNATIVE 2 (2037)

Overall, alternative 2 would improve congestion and LOS along the Spur, most notably at subarea 3. While subarea 1 would still experience at least one turning movement at LOS E in the AM and PM peak hours, improvements would include improved line of sight and additional space to merge into Spur traffic, resulting in long-term, beneficial impacts. The congestion at subarea 3 (Wiley Oakley Drive) would improve to LOS C or better for both the AM and PM peak hours. Additionally, traffic delays and crashes are expected to decrease because of the grade separation of the bridge at subarea 3 under alternative 2. Overall density of traffic on the Spur would increase but would not result in LOS failure during peak hours.

Alternative 3

Under alternative 3, NPS would implement the same improvements at subareas 1, 2, and corridor wide as described under alternative 2. The existing bridge crossing West Prong in subarea 3 would be replaced by two contra-flow bridges approximately 1,400 feet north and south of the existing structure. Similar to alternative 1, traffic volumes are expected to increase by 1.5 percent annually, and traffic volumes were forecasted for the year 2037 to analyze future traffic conditions. NPS could also construct two one-way bridges at these locations as opposed to two-way contra-flow bridges. While traffic conditions have not been forecasted for one-way bridges, they would likely be similar to the analysis below.

The impacts on traffic at subareas 1 and 2 would be the same under alternative 3 as those described for alternative 2. With the implementation of two contra-flow bridges north and south of the existing bridge, traffic crossing the Spur would still be at grade, and the vehicles would continue to be unable to make movements directly across all lanes of the Spur, which is the source of LOS failures under the existing conditions. At subarea 3, the delay turning right onto the southbound Spur from the Gatlinburg Welcome Center and Westgate Resorts Road would improve compared to alternative 1. From Westgate Resorts Road, the delay during the AM peak hour would improve from 334.7 seconds to 68.4 seconds and during the PM peak from 3,052.5 seconds to 762 seconds. These improvements, decreasing to a third of delays under alternative 1, would be noticeable; however, the LOS would remain at F. The delay from Westgate Resorts Road to North Mountain Trail, and entering Westgate Resorts Road from the Spur, would slightly worsen from LOS A to LOS B during AM peak hours. The new left turn traffic movements on the contra-flow bridges would operate at LOS F and noticeable delays in the AM and PM hours. The northern bridge entering the southbound Spur would operate with LOS F under AM and PM peak hours and at LOS E entering the northbound Spur during the PM peak hour. The southern bridge entering the southbound Spur would operate at LOS E during the AM peak hour and at LOS F entering the northbound Spur during the AM and PM peak hours. See complete details for LOS for all turning movements in table A-6 and figure A-10.

TABLE A-6: INTERSECTION PEAK TRAFFIC CONDITIONS (ALTERNATIVE 3)–SUBAREA 3

Direction	Alternative 1				Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
Eastbound Left-Through	0.2	A	0.1	A	0.2	A	0.1	A
Westbound Through-Right	-	-	-	-	0	A	0	A
Southbound Left-Right	10.0	A	9.6	A	10.8	B	9.8	A
Eastbound Left	-	-	-	-	448.1	F	96.6	F
Westbound Right	334.7	F	3052.5	F	68.4	F	762	F
Westbound Left-Right	-	-	-	-	3.7	A	3.3	A
Northbound Through-Right	8.8	A	10.7	A	10.6	B	12.4	B
Southbound Left-Through	8.7	A	9.3	A	11.2	B	12	B

Direction	Alternative 1				Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
Westbound Left (North)	-	-	-	-	399.3	F	211.1	F
Eastbound Left (North)	-	-	-	-	23.1	C	40.1	E
Westbound Left (South)	-	-	-	-	39.8	E	25.4	D
Eastbound Left (South)	-	-	-	-	179.9	F	212	F

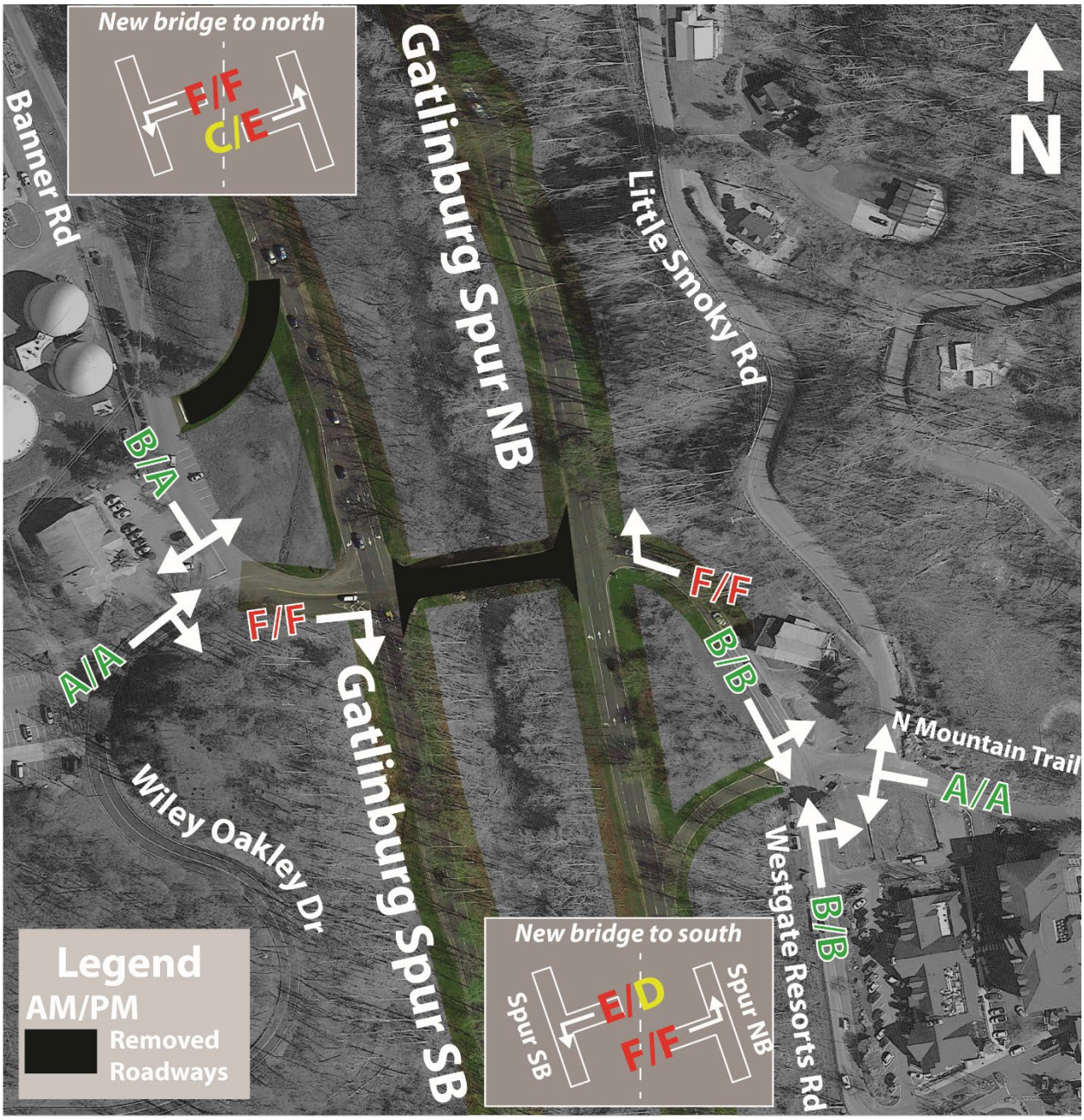

FIGURE A-10: SUBAREA 3 LEVEL OF SERVICE–ALTERNATIVE 3 (2037)

Overall, alternative 3 would improve congestion and LOS along the Spur, but some turning movements associated with subarea 3 would still operate at unacceptable levels. Similar to alternative 2, subarea 2 would still experience at least one turning movement at LOS F in the AM peak hour. Safety improvements would include improved line of sight and additional space to merge into Spur traffic, resulting in long-term beneficial impacts. The congestion at subarea 3 (Wiley Oakley Drive) would also still experience unacceptable LOS; however, the delays would be reduced compared to alternative 1, and removing the ability for vehicles to cross directly across multiple lanes of traffic. Overall density of traffic on the Spur would increase but would not result in LOS failure during peak hours.

Alternative 4

Under alternative 4, NPS would implement the same improvements at subareas 1, 2, and corridor wide as described under alternative 2. Under alternative 4, vehicle movements across the existing bridge crossing the West Prong in subarea 3 would be restricted. Vehicles would no longer be able to use the bridge to access the southbound Spur from the northbound Spur. Additionally, vehicles on the bridge would no longer be able to cross the northbound Spur to access properties to the east of the Spur. Vehicles on the bridge would only be able to turn left onto the northbound Spur and then would use local roads or the bridge at subarea 2 to reach their destination. Similar to alternative 1, traffic volumes are expected to increase by 1.5 percent annually and traffic volumes were forecasted for the year 2037 to analyze future traffic conditions.

The impacts on traffic at subareas 1 and 2 as they relate to the proposed improvements would be the same under alternative 3 as alternative 2. The changes at subarea 3 under alternative 4 would have impacts on LOS at both subareas 2 and 3. The delay entering the southbound Spur from Flat Branch Road (subarea 2) would worsen from 87.9 seconds to 811 seconds during the AM peak hour between alternative 1 and alternative 4; during the PM peak hour, the delay would worsen from 28.3 seconds to 252.3 seconds. These delays would increase because vehicles would be unable to access the southbound Spur from the eastern side of the Spur at subarea 3. Drivers would need to drive the northbound Spur to Huskey Grove Road (subarea 2), use the existing bridge, and then re-enter the Spur going southbound. Under both alternatives, the movement would operate at LOS F for the AM peak hour. Alternative 1 results in a LOS of D for the PM peak hour. LOS would worsen to LOS of F for the PM peak hour under alternative 4, resulting in an adverse impact at subarea 2. The intersection of eastbound Wiley Oakley Road at the southbound Spur would slightly worsen from a delay of 154.4 seconds during the AM peak hour to 195.8 seconds, and from 31.2 seconds during the PM peak hour to 38.4 seconds. This latter movement would worsen from acceptable conditions (LOS D) to unacceptable (LOS E). Under alternative 4, the delay entering the northbound Spur from the bridge crossing West Prong would improve from being incalculable (Error) during the AM peak hour to a delay of 2,233.4 seconds. The delay from Westgate Resorts Road to the northbound Spur would improve during the AM peak hour from a 334.7-second delay to a 56.5-second delay. Similarly, during the PM peak hour this movement would improve from a 3052.5-second delay to a 681.6-second delay. During both the AM and PM peak hours under both alternative 1 and alternative 4, the movement would operate with unacceptable delays.

See complete details for LOS for all turning movements in table A-7 and figures A-11 and A-12.

TABLE A-7: INTERSECTION PEAK TRAFFIC CONDITIONS (ALTERNATIVE 4)–SUBAREA 3

Direction	Alternative 1				Alternative 4			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
Eastbound Right	87.9	F	28.3	D	811	F	252.3	F
Eastbound Left-Right	8.7	A	8.8	A	9.8	A	10.1	B
Northbound Left-Through	4.4	A	2.2	A	7.7	A	7.8	A
Eastbound Left-Right	8.8	A	8.8	A	9.4	A	9.5	A
Northbound Left-Through	4.0	A	2.3	A	7.8	A	7.9	A
Westbound Left	8.8	A	8.8	A	9.9	A	10.2	B
Eastbound Right	154.4	F	31.2	D	195.8	F	38.4	E
Eastbound Left	Error	F	Error	F	2233.4	F	-	-

Direction	Alternative 1				Alternative 4			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
Westbound Right	334.7	F	3052.5	F	56.5	F	681.6	F
Eastbound Left-Through-Right	7.8	A	8.4	A	7.8	A	8.5	A
Northbound Through-Right	8.8	A	10.7	A	9.2	A	11.6	B
Westbound Left-Right	-	-	-	-	9.5	A	10.7	B

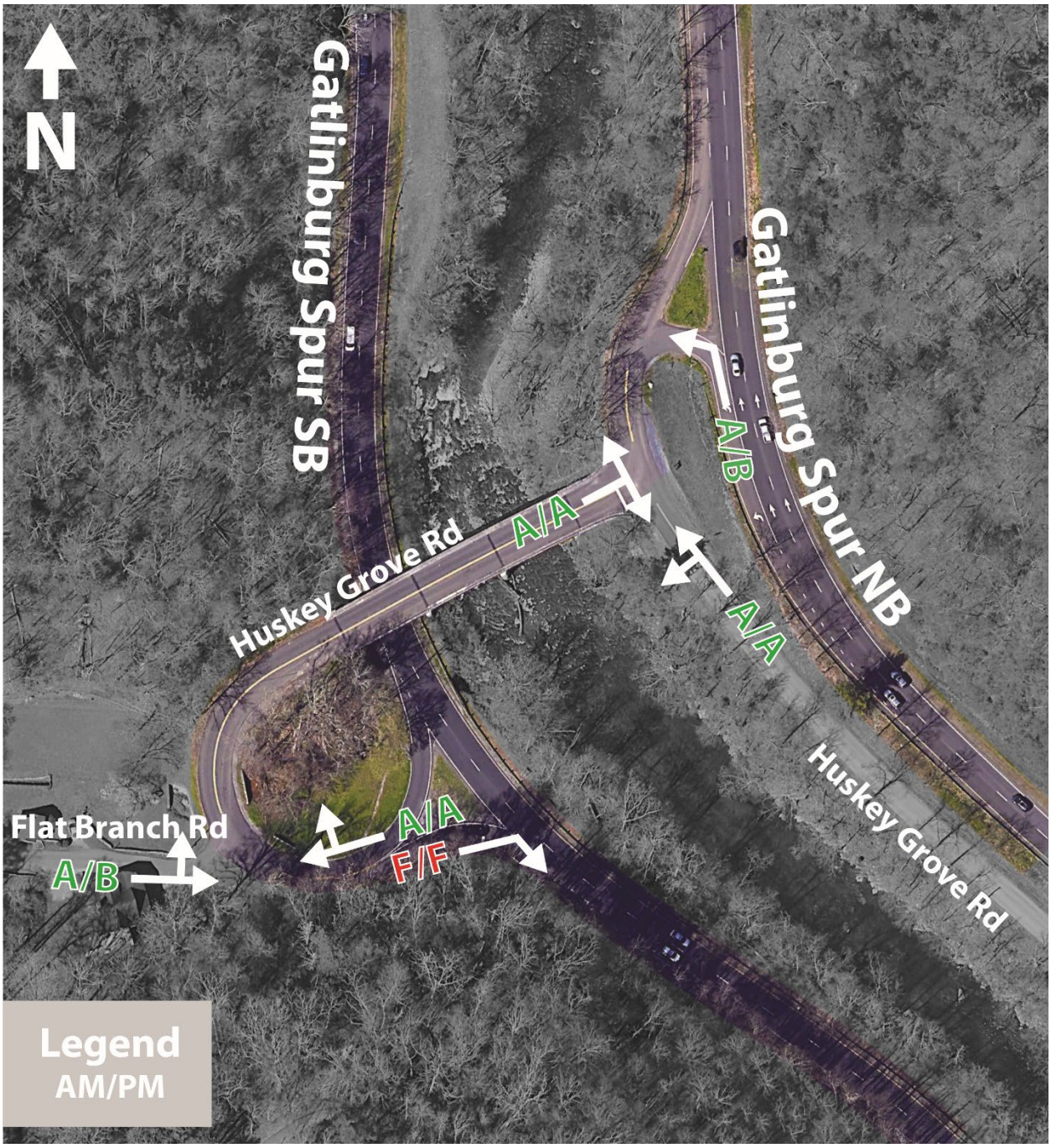

FIGURE A-11: SUBAREA 2 LEVEL OF SERVICE–ALTERNATIVE 4 (2037)

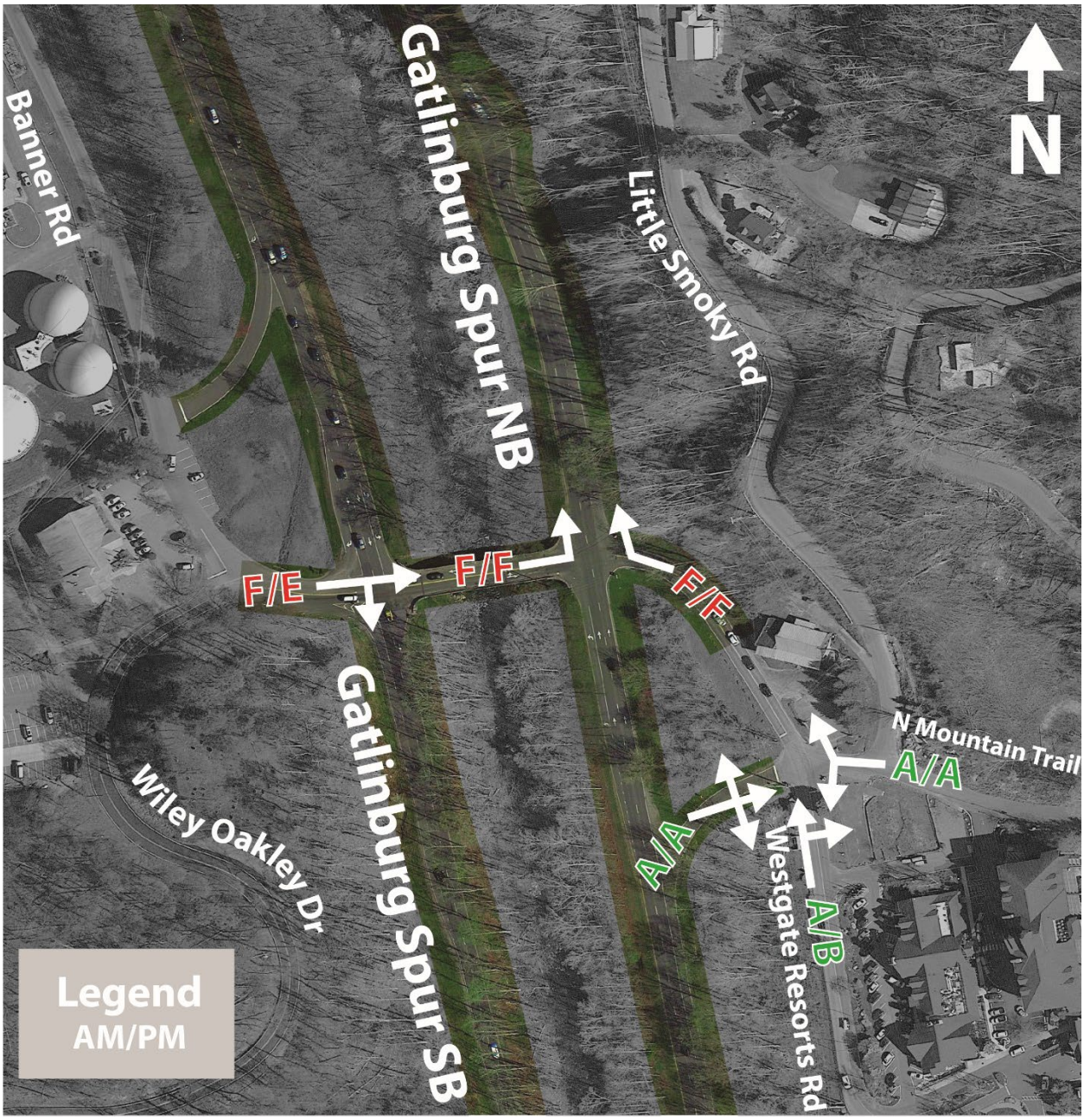

FIGURE A-12: SUBAREA 3 LEVEL OF SERVICE–ALTERNATIVE 4 (2037)

Overall, alternative 4 would improve congestion and LOS along the Spur, but some turning movements associated with subarea 3 would still operate at unacceptable levels. Impacts from the restricted turning movements at subarea 3 would also result in increased delays and queuing at subarea 2. Similar to alternative 2, subarea 2 would still experience at least one turning movement at LOS F in the AM peak hour, but improvements (improved line of sight and additional space to merge into Spur traffic) would have long-term, beneficial impacts. The congestion at subarea 3 (Wiley Oakley Drive) would continue to experience unacceptable LOS; however, the delays would be reduced compared to alternative 1 and removing the ability for vehicles to cross directly across multiple lanes of traffic. Overall density of traffic on the Spur would increase but would not result in LOS failure during peak hours.

APPENDIX B: FLOODPLAINS STATEMENT OF FINDINGS

United States Department of the Interior
National Park Service
Great Smoky Mountains National Park

Gatlinburg Spur Improvements

Draft Statement of Findings for Floodplains

May 2022

Recommended: _____ _____

Superintendent, Date
Great Smoky Mountains National Park

Certification of
Technical Adequacy and
Servicewide Consistency: _____ _____

Chief, Date
Water Resources Division

Approved: _____ _____

Director, Date
Region 2

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STATEMENT OF FINDINGS

Introduction

The National Park Service (NPS) is proposing to implement improvements along the Gatlinburg Spur (the Spur), a road between Pigeon Forge and Gatlinburg in Sevier County, Tennessee. The Spur is part of the Foothills Parkway and Great Smoky Mountains National Park (the Park). The Spur, a segment of US 441/US 321, comprises approximately 4.2 miles of four-lane divided urban parkway (figure 1), serving more than 49,000 vehicles per day between Pigeon Forge and Gatlinburg. The West Prong Little Pigeon River (West Prong) runs between the northbound and southbound lanes, with bridges connecting intersections on either side. Portions of the Spur are in the 100-year floodplain of the West Prong.

Executive Order 11988, "Floodplain Management," and Executive Order 13690, "Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input," require NPS and other federal agencies to evaluate the likely impacts of actions in floodplains and to improve the nation's resilience to flood risk. The objective of Executive Order 11988 is to avoid, to the extent possible, the long- and short-term, adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Executive Order 13690 was issued to establish a Flood Risk Management Standard for federally funded projects to improve the nation's resilience to floods and to ensure new federal infrastructure will last as long as intended. NPS requirements for complying with the floodplain executive orders are outlined in NPS Procedural Manual 77-2 and Director's Order 77-2. This Statement of Findings (SOF) documents compliance with these NPS floodplain management procedures. The SOF will be published and made available for public review with the environmental assessment (EA).

Project Description

PROPOSED ACTION (PREFERRED ALTERNATIVE)

The purpose of the action is to improve level of service (LOS) in consideration of future traffic volumes along the Spur in a manner that retains the parkway character of the road. Alternative 2 analyzed in the EA prepared for the project is the NPS preferred alternative (NPS 2022). The proposed action would implement corridor-wide improvements and specific improvements at three intersections (i.e., subareas) along the Spur. As described in chapter 2 of the EA, corridor-wide improvements include installation of curb and gutter treatments, shoulder hardening, rockfall mitigation, intelligent transportation systems, and pull-off areas. These improvements could be implemented at selected locations as needed along the Spur. All corridor-wide improvements would occur outside the floodplain. Therefore, this SOF does not address corridor-wide improvements further.

The project area, the preferred alternative (alternative 2 in the EA), and associated subarea improvements are described below.

SITE DESCRIPTION

The project area is located along a 4.2-mile segment of the Spur (figure 1). The Spur serves local communities/commuters and Park visitors and staff. The roadway also connects to the Gatlinburg Bypass, providing an alternate route to the Park without traveling through downtown Gatlinburg. The corridor serves as a primary route to reach North Carolina to the south and the Knoxville area to the northwest. Increases in Park visitation and growth in the local population have increased traffic volumes. Volumes are particularly high during daily peak commuting hours and during the Park's peak visitation seasons.

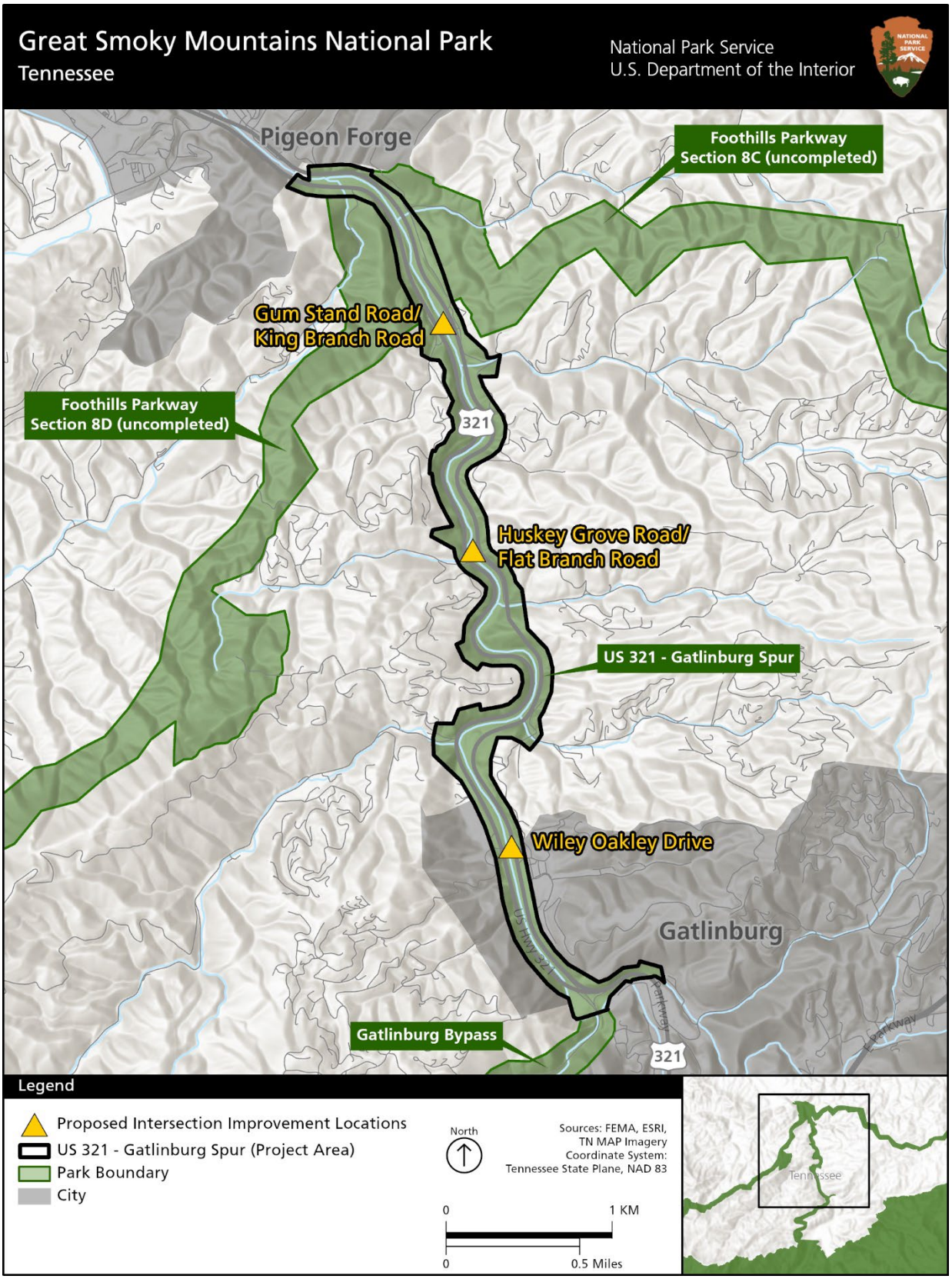

FIGURE 1: PROJECT AREA

SUBAREA 1 – GUM STAND ROAD / KING BRANCH ROAD/GNATTY BRANCH ROAD

The first subarea is the Spur's intersection with Gum Stand Road/King Branch Road/Gnatty Branch Road (figure 1). Gum Stand Road is located west of the Spur and provides access to/from the Spur southbound. King Branch Road and Gnatty Branch Road are located east of the Spur with on-ramps to the northbound Spur. A bridge across the river, located between the Spur lanes, provides access to the Spur north from Gum Stand Road and to the Spur south from King Branch Road and Gnatty Branch Road. The location of the bridge creates a difficult pattern for drivers entering and exiting the bridge (e.g., a driver on the bridge attempting to turn north onto the Spur needs to be aware of vehicle traffic traveling northbound, including those drivers turning left in front of them onto the bridge). A similar situation exists in the southbound. Similarly, motorists on the bridge attempting to access Gum Stand, King Branch, or Gnatty Branch Roads are forced to quickly merge across two lanes to depart the Spur.

In subarea 1, the Park would convert the existing bridge to a contra-flow bridge where vehicles travel to the left of opposing traffic, making left-turn movements to and from the bridge via free-flow movements into an acceleration lane (see figure 2). This design would allow vehicles crossing the bridge to turn left onto the Spur without having to stop or cross oncoming traffic. Vertical separation (including concrete islands or delineators) would be installed along the northbound Spur's acceleration lane between the bridge and King Branch Road/Gnatty Branch Road to prevent vehicles from entering the bridge into the wrong lane. The same separation would occur southbound. Signage would alert motorists to the new bridge pattern. Road striping would also indicate the proper lanes to use. To accommodate larger vehicles' turning radii, the acceleration lanes would also be widened. Two retaining walls, one on the interior of the Spur in each direction, would also be required. These retaining walls would be approximately 775 to 840 feet long and 9 to 10 feet tall. Any retaining walls required would use materials that complement the existing aesthetic of the Parkway.

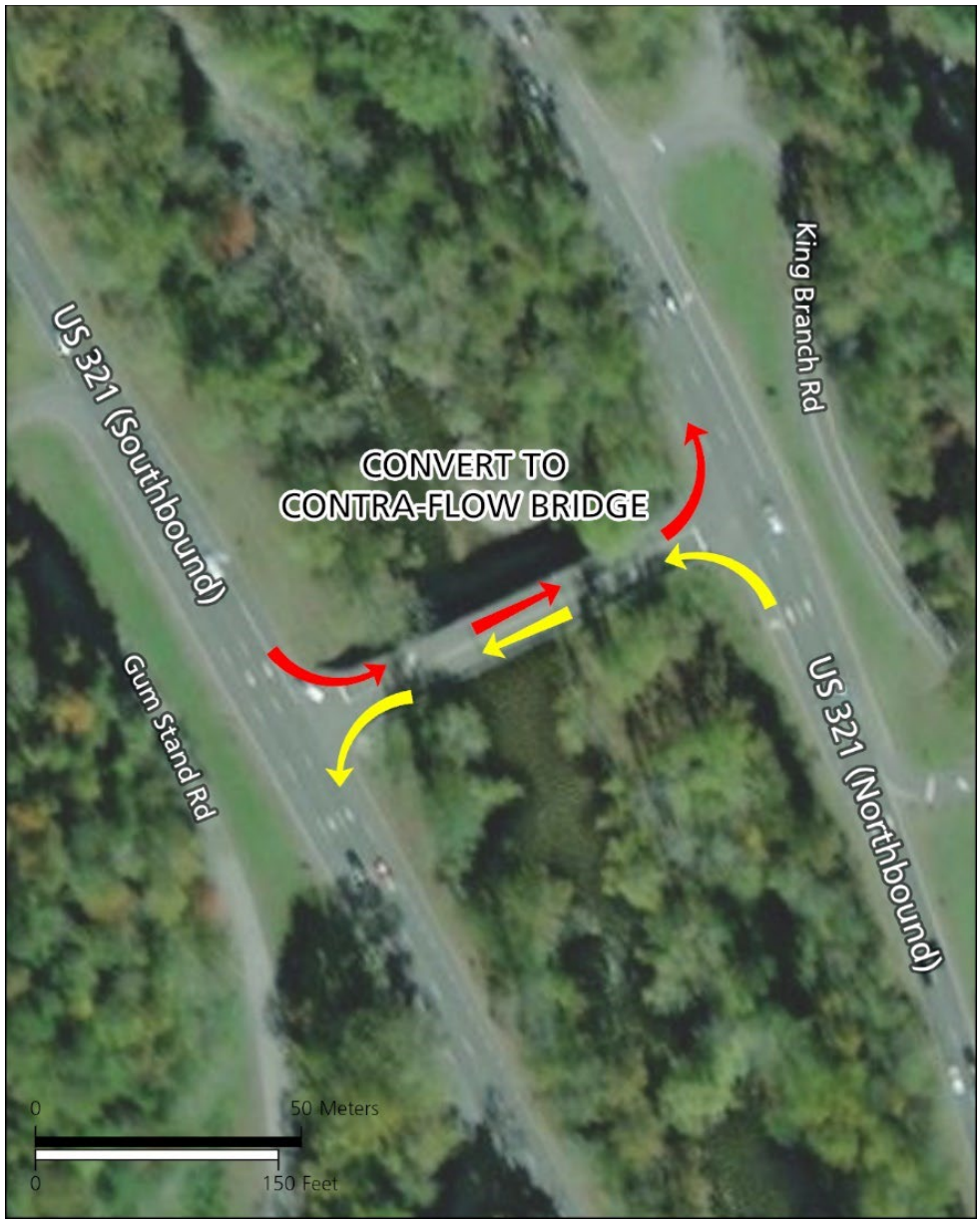

FIGURE 2: ALTERNATIVE 2—SUBAREA 1 PROPOSED CONTRA-FLOW BRIDGE

SUBAREA 2 – HUSKEY GROVE ROAD / FLAT BRANCH ROAD

Subarea 2 is located at the intersection of the Spur with Huskey Grove Road and Flat Branch Road (figure 1). Huskey Grove Road travels along a bridge over the West Prong and the southbound Spur. It connects to Flat Branch Road at an intersection 200 feet west of the southbound Spur where an on/off-ramp to the Spur is provided. East of the West Prong, Huskey Grove Road continues south, paralleling the Spur and north to on/off-ramps connecting with the northbound Spur. Existing on-ramps and acceleration lanes at Huskey Grove Road and Flat Branch Road are shorter than required for the speed limit on the Spur. This results in vehicles stopping on the on-ramps, instead of yielding, and creates unsafe traffic conditions.

At subarea 3, the Park would extend the acceleration lanes along the west side of both the southbound and northbound Spur (figure 3) to allow traffic entering the Spur to yield to oncoming traffic instead of coming to a full stop. Extending the acceleration lanes would allow vehicles additional time to increase their speed to meet the flow of traffic while increasing their line of sight to merge into traffic. Extending the northbound acceleration lane by approximately 820 feet would require 1 acre of disturbance and removal of existing vegetated areas, including grass and several small trees. A retaining wall, approximately 160 feet long and 8 feet tall, would be needed. Extending the southbound acceleration lane by approximately 800 feet would require approximately 1.4 acres of disturbance, including cutting into the rockface to accommodate a 775-foot-long and 25-foot-tall retaining wall adjacent to the roadway.

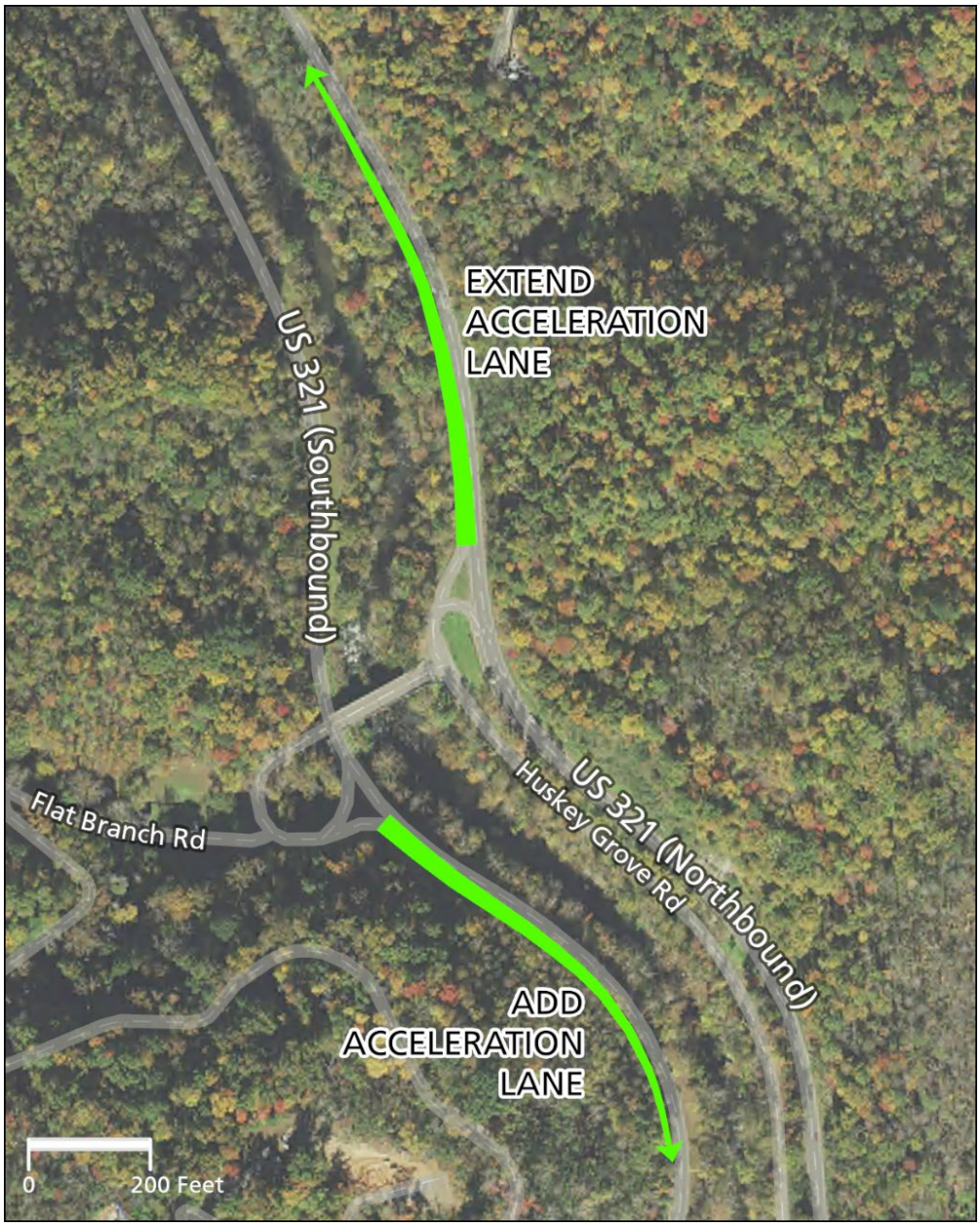

FIGURE 3: ALTERNATIVE 2—SUBAREA 2 PROPOSED ACCELERATION LANES

SUBAREA 3 – WILEY OAKLEY DRIVE

Subarea 3 includes the intersection of the Spur with Wiley Oakley Drive, which runs perpendicular to the Spur across West Prong (figure 1). The Gatlinburg Welcome Center is about 200 feet west of this intersection. East of the Spur, the roadway continues as Little Smoky Road and intersects with North Mountain Trail. The Wiley Oakley Drive bridge is heavily used because of the location of the welcome center on one side and a private resort development on the other. Traffic backups on the bridge can be significant for motorists turning left or continuing straight.

At subarea 3, the Park would construct a flyover bridge to provide a grade-separated interchange to eliminate vehicles crossing both lanes of the Spur, reduce the number of left-hand turn movements, and allow motorists to merge onto the Spur more easily. Figure 4 displays the location of the flyover bridge and alterations to the existing traffic patterns. The flyover bridge would be approximately 450 feet long and would provide at least 16 feet of vertical clearance over the Spur for larger vehicles. A retaining wall, approximately 30 to 40 feet long and 5 to 7 feet tall, would be needed.

The flyover bridge would eliminate turning movements from the Spur mainline in this subarea, and all turns would instead use the flyover bridge with associated acceleration lanes. The existing bridge structure would be removed. The existing bridge currently includes local utilities, including a 4-inch gas line, an 8-inch sewer line, and up to an 8-inch water line. The utilities would be relocated under the river using open-trench construction near the existing bridge. The water and sewer lines would be placed approximately 20-feet apart from each other with the gas line between. Open-trench construction would be used to install concrete encased pipes across approximately 75 linear feet of the river crossing. Instream work would be conducted in-the-dry, using coffer dams or a similar solution for temporary water diversion. The total width of the disturbance for all three lines combined would be approximately 45 feet, for a total disturbance of 3,375 square feet or 0.08 acres. Directional boring of the river crossing was considered but determined not to be feasible because of the presence of large boulders/aggregate. The existing sewer line is a gravity line that flows from east to west to the sewer plant. As a result of the relocation, the sewer line would also require construction of a new pump station, which would disturb up to 2,500 square feet near the intersection of Little Smoky Road and Westgate Resorts Roads adjacent to the northbound Spur. The pump station could be located in or outside the Park boundary; however, NPS prefers to have non-park infrastructure located outside the Park boundary. The pump station would be located outside the 100-year floodplain.

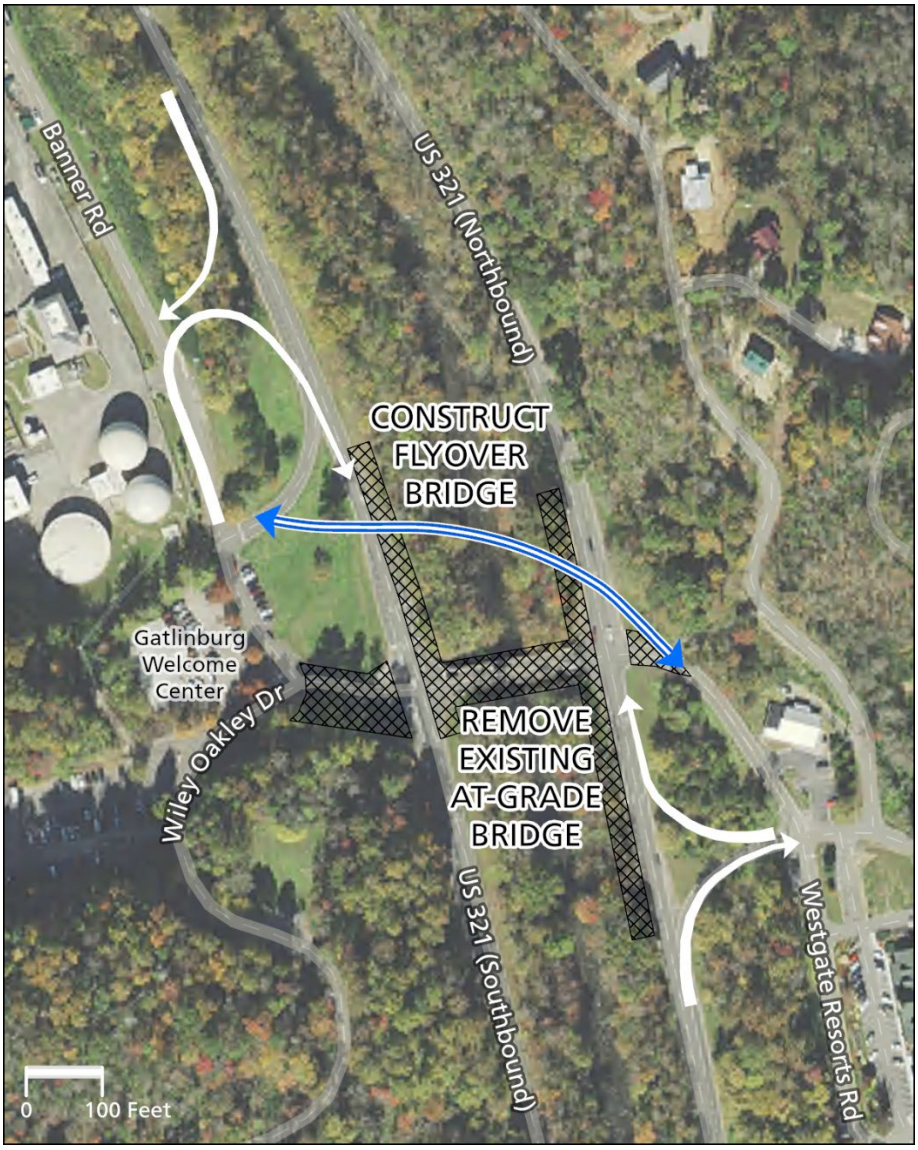

FIGURE 4: ALTERNATIVE 2—SUBAREA 3 PROPOSED FLYOVER BRIDGE

CONSTRUCTION

Table 1 provides the total area of disturbance for the proposed action. Overall, the proposed action would require approximately 7.5 to 8 acres of disturbance during the construction period. While the proposed elevated bridge in subarea 3 would span the 100-year floodplain of the West Prong, the road/bridge footprint and potential impacts on floodplains in this area would be minimized by using relatively steep side slopes, engineered fill, or other structural design elements. In addition to the acres of disturbance provided in table 1, under the proposed action, NPS would remove the existing bridge at Wiley Oakley Drive, which would remove 0.67 acres of existing road and bridge infrastructure in the floodplain, although a portion of that disturbance includes the elevated bridge structure. The piers on the existing bridge would require approximately 0.088 acres of temporary disturbance within the floodplain to remove.

TABLE 1: AREA OF DISTURBANCE FOR THE PROPOSED ACTION

Location	Area of Disturbance (acres)[3]		
	Temporary[1]	Permanent[2]	Total
Floodplain			
Subarea 1	0.69	0.02	0.71
Subarea 2	0.01	0	0.01
Subarea 3	0.36	0.2	0.56
Bridge and Road Removal in Subarea 3 (not included in total)		-0.67	-0.67
Floodplain Total	**1.06**	**0.22**	**1.28**
Non-Floodplain			
Subarea 1	0.81	1.17	1.98
Subarea 2	1.84	0.6	2.43
Subarea 3	1.27	1.71	3.73
Non-floodplain Total	**3.91**	**3.48**	**7.39**
Project Total			
Subarea 1	1.5	1.19	2.69
Subarea 2	1.84	0.6	2.44
Subarea 3	1.63	1.91	3.54
Project Total	**4.97**	**3.7**	**8.66**

(1) Temporary disturbance includes areas disturbed by earth-moving activities (cut and fill), vegetation clearing, and equipment operation during construction that would be revegetated in accordance with a project-specific restoration plan once construction is complete.
(2) Permanent disturbance includes areas that would be paved (road and bridge surfaces) or hardened (retaining walls, riprap) during construction.
(3) Area of disturbance does not include corridor-wide improvements because they would all be located outside of the floodplain.

Floodplains and Existing Site-Specific Flood Risks

The project area is located within the Lower French Broad River (06010107) Hydrologic Unit Code (HUC) watershed (509,776 acres). At a finer scale, the project area is within the West Prong Little Pigeon River subwatershed (12-digit HUC 060101070206) between Gatlinburg, Tennessee, and Pigeon Forge, Tennessee (NWQMC 2021). Beyond Pigeon Forge, the West Prong merges with the main stem of the Little Pigeon River in Sevierville and then flows until it meets the French Broad River below Douglas Lake. The West Prong can overflow its bank during localized high flow events. Floodplain values include the ability of the floodplain to absorb increased water flows, recharge groundwater, and provide floodplain habitat. Floodplains in the project area provide wildlife habitat for wetland and riparian species, allow for flood storage, and facilitate conveyance.

The Federal Emergency Management Agency (FEMA) defines Zone A and Zone AE floodplains as areas with a 1% annual chance of flooding (i.e., located within the 100-year floodplain), but notes Zone A lacks detailed analyses defining base flood elevations while base flood elevations are defined in Zone AE (FEMA 2020). Portions of the existing southbound Spur are located within the West Prong floodplain classified as Zones A and AE (figure 1). The proposed action would affect floodplain areas classified as Zone A and Zone AE, as displayed in figures 5 through 7. The portions of the project area outside the West Prong Zone A and Zone AE floodplains are classified as Zone X. These areas have minimal flood hazard and are above the 500-year flood level (FEMA 2019). Landcover upstream of the project area includes developed areas of medium to high density (Gatlinburg) and steep areas of deciduous and evergreen forest (USGS 2021). Floods of potential consequence at the West Prong generally occur with some warning. In general, a prolonged period of intense rain for about 12 to 24 hours could create extreme flood conditions. USGS gage 03469251 West Prong Little Pigeon River near Gatlinburg, TN, records flow conditions within the West Prong just above the project area (USGS 2022). Although the West Prong has not flooded onto the Spur roadway in recent memory, Gatlinburg city officials maintain the city's emergency siren system for extreme flooding conditions.

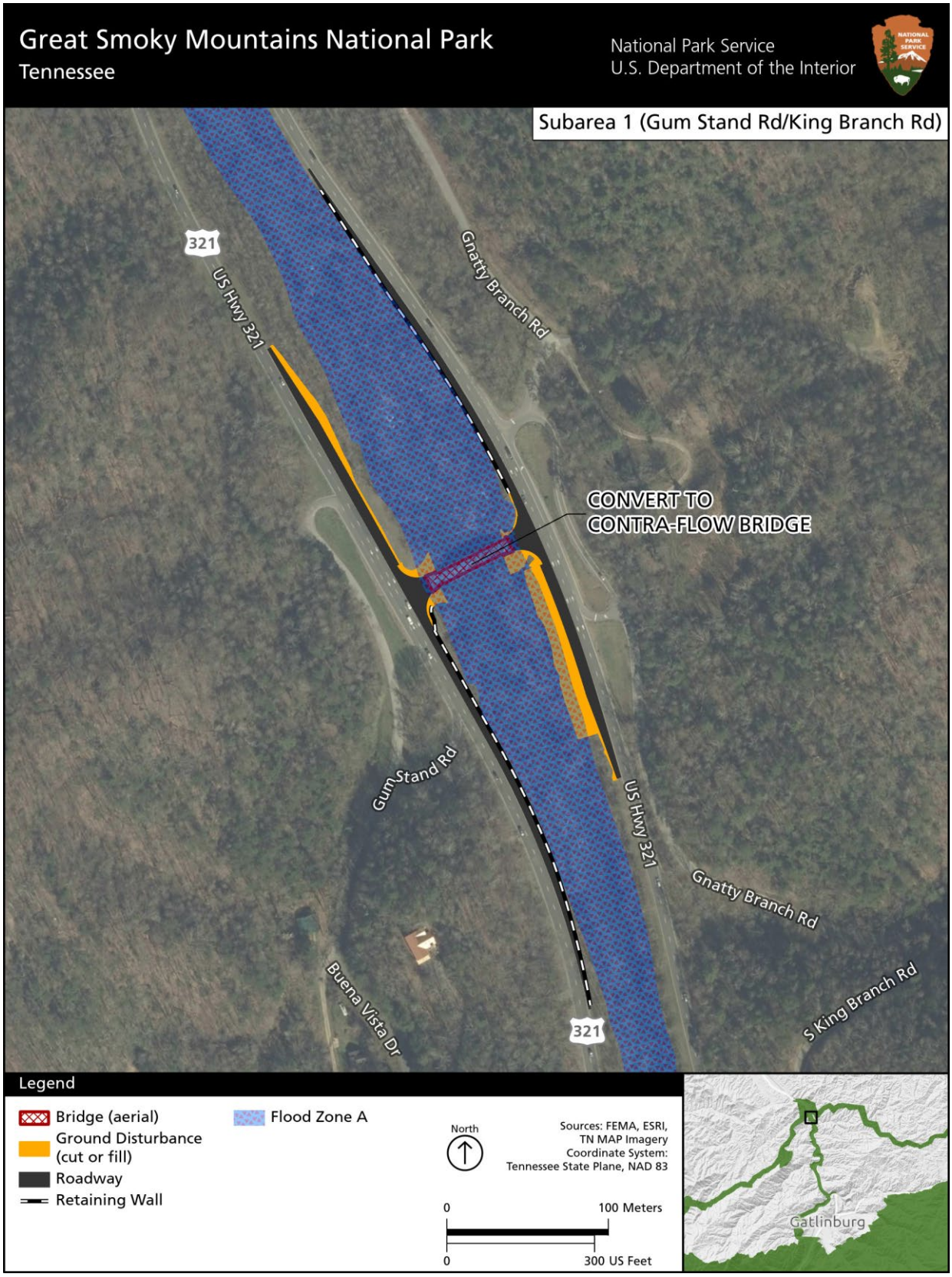

FIGURE 5: ALTERNATIVE 2—SUBAREA 1 FLOODPLAIN AND PROPOSED ACTION

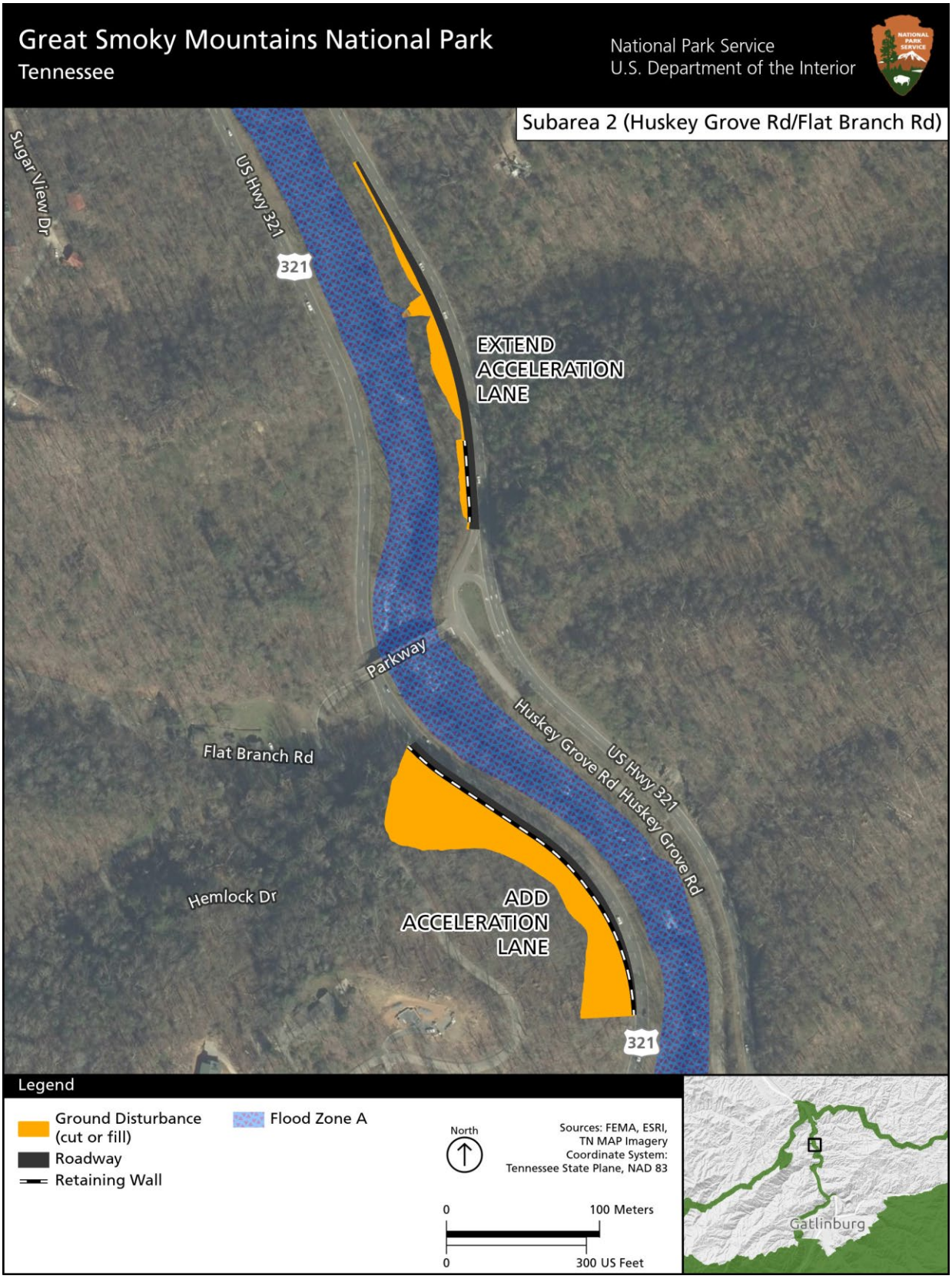

FIGURE 6: ALTERNATIVE 2—SUBAREA 2 FLOODPLAIN AND PROPOSED ACTION

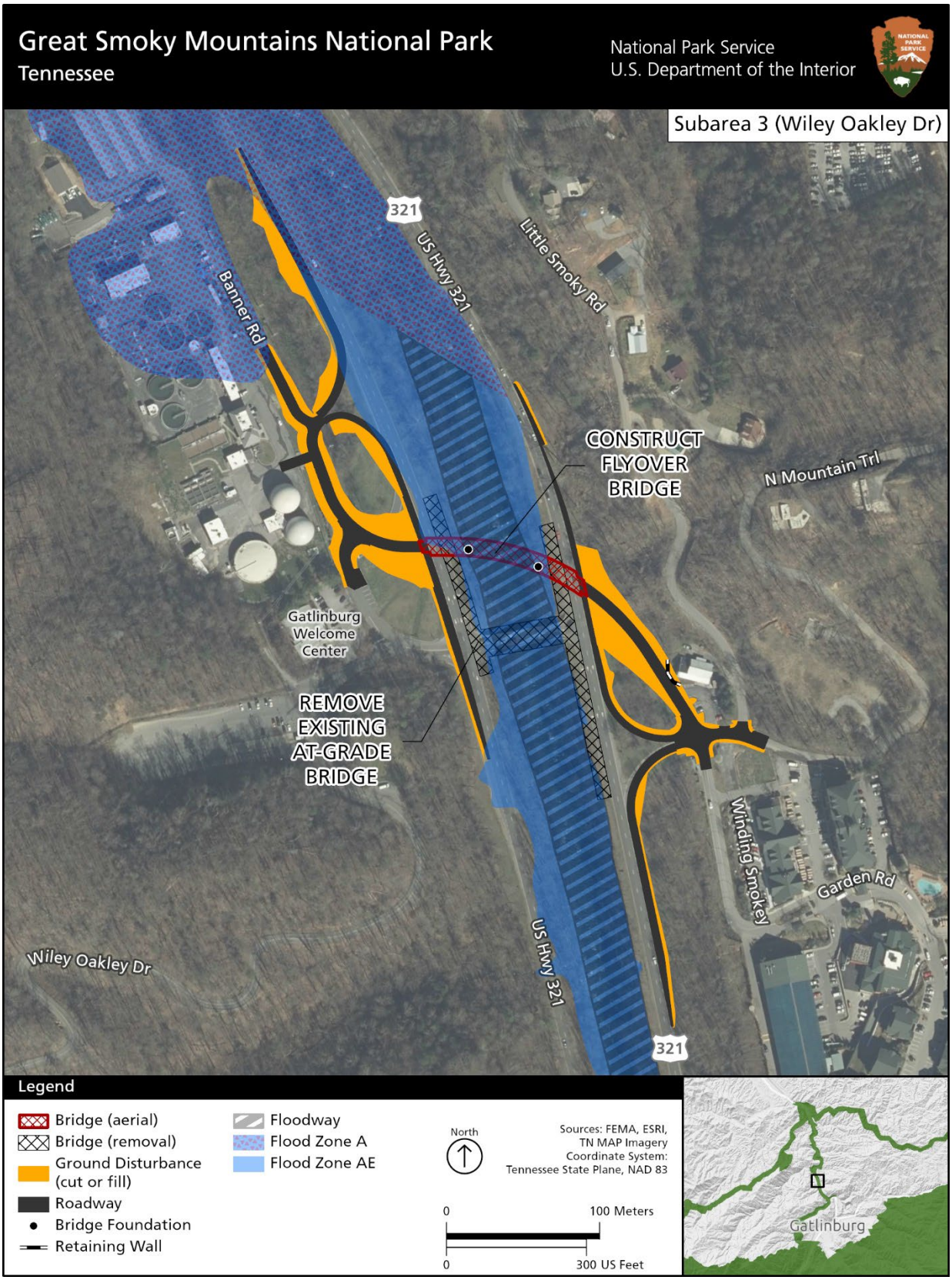

FIGURE 7: ALTERNATIVE 2—SUBAREA 3 FLOODPLAIN AND PROPOSED ACTION

Justification for the Use of the Floodplain

The potential impact on floodplains under the proposed action is justified because none of the other proposed alternatives would eliminate impacts on floodplains. The narrow transportation corridor and the Foothills Parkway boundary make construction of improvements at the three identified intersections along the Spur impossible without the use of floodplains. In addition, as noted above, a portion of the southbound Spur at subarea 3 was constructed in floodplain Zones A and AE. As such, any roadway improvements in this area would result in impacts on the floodplain. Ultimately, improvements are needed to reduce cross-traffic turning movements and congestion and improve flow. Given the location of the West Prong between the north and southbound lanes and the fact that portions of the southbound Spur are already located within the floodplain, it is not feasible to improve LOS while completely avoiding the floodplain.

Alternatives

The EA prepared for this project considered four alternatives, including the no action alternative (alternative 1), the proposed action described above (alternative 2), and two other action alternatives (alternative 3 and alternative 4). While the action alternatives included the development of the same corridor-wide improvements and improvements at subareas 1 and 2, the specific improvements in subarea 3 varied. Impacts on floodplains would be the same across all alternatives for subareas 1 and 2, because there is only one action alternative in those locations. As a result, every action alternative would have potential impacts on floodplains, but these impacts would vary slightly across the three action alternatives at subarea 3.

Under the no action alternative, there would be no change to the existing corridor or intersections along the Spur. Congestion and safety concerns are expected to continue. Alternatives 3 and 4 are described in chapter 2 of the EA. Compared to the proposed action, floodplain impacts would be 0.90 acres greater under alternative 3 and 0.56 acres lower under alternative 4. Alternative 4, however, would only address a reduction in unsafe turning movements and would not reduce congestion. Furthermore, it would increase travel time and distances, including for emergency vehicles.

Floodplain Impacts

Potential Risks to Human Health and Safety

The proposed action does not include construction of habitable structures in the floodplain and is not expected to change or increase the use of the floodplain. The new flyover bridge in subarea 3 would be higher than the existing bridge, and the old bridge and associated piers would be removed, resulting in less infrastructure within the West Prong. Additionally, these improvements would reduce congestion and improve access for emergency response, which could reduce overall risk to human health and safety. The proposed bridge over the West Prong at subarea 3 would be designed to ensure it is not over topped during a 100-year flood event and would span the 100-year floodplain. Two smaller piers, approximately 6 feet in diameter, would be located within the 100-year floodplain but outside the West Prong. Construction of retaining walls, bridges, and the addition of fill in each subarea would not constrict flow or increase water surface elevations upstream. Flood risks to human health and safety would not change from existing conditions under the proposed action.

Potential Risks to Property

In accordance with NPS Director's Order 77-2 and *Procedural Manual 77-2*, the proposed action constitutes a Class I Action (location or construction of administrative, residential, warehouse, and

maintenance buildings and non-excepted [overnight] parking lots, or other human-made features if they lie within the 100-year floodplain). Specific project elements that would be in the floodplain and potentially damaged by a flood include retaining walls, cut and fill, and roadway improvements, as detailed below.

Subarea 1

- Cut and fill: No cut within the floodplain. Addition of 0.69 acres of fill within the floodplain.
- Retaining walls: Northbound, the 840-foot retaining wall would be located on the boundary with the floodplain. Southbound, the 840-foot retaining wall would be located just outside the floodplain boundary, except for the northern-most 20 feet, which would be adjacent to the bridge wingwall.
- New roadway: 0.02 acres of permanent infrastructure for the bridge wall widening, where the Spur is already located within the floodplain.

Subarea 2

- Cut and fill: No fill within the floodplain. Removal of 0.01 acres of cut within the floodplain.
- Retaining walls: None within the floodplain.
- New roadway: None within the floodplain.

Subarea 3

- Cut and fill: No fill within the floodplain. Removal of 0.36 acres of cut within the floodplain located adjacent to the existing road but not adjacent to the river prism.
- Retaining walls: None within the floodplain.
- New roadways: 0.20 acres within the floodplain, which is within or adjacent to the existing roadway and includes approximately 0.01 acres for two bridge foundations which would be located outside of the river prism but within the floodplain.

Specific new capital investments within the floodplain under the proposed action would be limited to the roadway. NPS would place the new bridge above the floodplain and remove the existing at-grade bridge. The flyover bridge would be higher than the existing bridge and would use piers within the floodplain, which would minimally restrict flood conveyance compared to the existing in-water piers and would likely be an improvement from existing conditions and reduce risks to property. Additionally, increased flooding at the proposed bridge location at subarea 3 is not expected to occur because the bridge would be designed to ensure a "no-rise condition" in upstream water surface elevations. As such, risks to property would be minimized by following Federal Highway Administration *Design Standards for Highways in National Flood Insurance Program Mapped Floodplains* (FHWA 1986).

POTENTIAL RISKS TO FLOODPLAIN VALUES

Floodplains provide an array of natural and physical resource values in the Park, including natural flood control, erosion control, groundwater recharge, habitat for vegetation and wildlife, and recreational opportunities. Ground disturbance and vegetation clearing in and adjacent to the floodplain during construction would temporarily increase stormwater runoff volume, soil erosion, and sediment transport, which would affect floodplain values. Including potential disturbance associated with the corridor-wide improvements, the total area of disturbance for the proposed action would be 10.67 acres; 1.28 acres of disturbance would be in the floodplain (table 1). Short-term impacts on floodplain values would be minimized during construction by implementing sediment and erosion control measures consistent with the requirements and recommendations contained in the Tennessee Department of Environment and Conservation's (TDEC) *Tennessee Erosion and Sediment Control Handbook* (TDEC 2012). NPS would

file a Notice of Intent with TDEC to obtain coverage under the General National Pollutant Discharge Elimination System Permit for Discharges of Stormwater Associated with Construction Activities (Permit Number TNR100000). A site-specific stormwater pollution prevention plan would be developed in accordance with Part 3 of the General Permit.

Instream work associated with the removal of the Wiley Oakley Bridge and relocation of existing utilities from the bridge to beneath the West Prong would also cause intermittent and localized increases in turbidity. After bridge removal and utility relocation are complete, the bottom of the river would be restored to natural or existing conditions. Applicable permits from the US Army Corps of Engineers and TDEC would be obtained in accordance with sections 404 and 401 of Clean Water Act prior to conducting instream work. Compliance with permit conditions and implementation of best management practices outlined in appendix 2 of NPS *Procedural Manual 77-1* (NPS 2016) would minimize potential impacts on surface waters. Utility lines would be encased in concrete beneath the river bottom to ensure durability.

In addition to temporary impacts during construction, removal of vegetation and creation of new impervious surfaces would result in long-term impacts on floodplain values including natural flood control, erosion control, and habitat. Construction would affect approximately 1.28 acres of vegetation in the floodplain (table 1), including both grass and riparian vegetation along the river. Of the 1.28 acres, 0.22 acres would be permanently removed. Floodplain areas temporarily disturbed during construction (1.06 acres) would be reseeded with a Park-approved seed mix following construction and restored in accordance with a project-specific revegetation plan.

Together with the corridor-wide improvements, the three subareas would contribute 2.04 acres of new impervious surface in the project area, including 0.22 acres of impervious surface within the floodplain, which would be within or adjacent to the existing Spur. While new impervious surface would be added, the project would also remove 0.92 acres of impervious surface associated with the removal of existing roads and bridge, resulting in a net increase of 1.07 acres. The project design phase would include development of stormwater drainage plans and stormwater management practices to minimize potential impacts on floodplain values from impervious surfaces.

Mitigation

FLOODPLAIN RISK MITIGATION

The following floodplain risk mitigation measures would be implemented under the proposed action:

- Potential risks to human health and safety would be mitigated with bridge design to ensure the bridge is above the level of a 100-year flood event.
- To mitigate potential risk to human health and safety, the Park would develop and implement a flood response plan for the Spur, which would include a forecasting system, flood alert system, and a pre-flood evacuation plan. Park staff would continue to monitor weather data from the National Weather Service and existing weather stations in the Park. The existing streamflow gauge on the West Prong above Gatlinburg (continuous gage approximately 3.25 miles upstream of the subarea 3, US Geological Survey station 03469251) would be used to monitor stream levels, forecast potential flooding, and inform flood evacuation stages. The US Geological Survey gage has a feature called WaterAlert that can be set to send flow and gage height data via text or email to a user-defined address. If a pre-flood evacuation of the area becomes necessary, the Park's Incident Command System would be activated with a Park Protection Ranger serving as the Incident Commander. The existing emergency notification system public warning sirens located in Gatlinburg and the Park would continue to operate as part of the city of Gatlinburg's all hazard notification system.

- Potential risks to property would be mitigated by following the Federal Highway Administration's *Design Standards for Highways in National Flood Insurance Program Mapped Floodplains* (FHWA 1986).
- Risks to floodplain values would be minimized during construction by implementing sediment and erosion control measures consistent with the requirements and recommendations contained in the *Tennessee Erosion and Sediment Control Handbook* (TDEC 2012). NPS would file a Notice of Intent with TDEC to obtain coverage under the General National Pollutant Discharge Elimination System Permit for Discharges of Stormwater Associated with Construction Activities (Permit Number TNR100000). A site-specific stormwater pollution prevention plan would be developed in accordance with Part 3 of the General Permit.
- Risks to floodplain values associated with instream water work would be mitigated by restoring any disturbed areas to natural or existing conditions and complying with applicable permits and best management practices.
- Risks to floodplain values associated with clearing of riparian forest vegetation would be mitigated by developing and implementing a revegetation plan.
- Risks to floodplain values associated with impervious surfaces would be mitigated through design of stormwater management practices to minimize stormwater runoff quantity and improve stormwater runoff quality.
- The structures and facilities would be designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 Code of Federal Regulations Part 60).

Conclusions

The proposed action would include safety improvements to the Spur, and some of the improvements would be within the regulatory 100-year floodplain of the West Prong. The proposed action would not alter flood elevations or increase flood risks to human health and safety. Portions of the existing roadway are within the floodplain, and no practical alternatives exist for non-floodplain sites. NPS concludes that mitigation measures contained in this document would minimize risk and that there would be no unacceptable risk to human health and safety, unacceptable impacts on property, or substantial long-term adverse impacts on floodplain values. Therefore, NPS finds the proposed action would be consistent with Executive Order 11988: *Floodplain Management* and NPS Director's Order 77-2: *Floodplain Management*.

References

Council on Environmental Quality (CEQ)

2014 *Memorandum for Heads of Federal Departments and Agencies: Effective Use of Programmatic NEPA Reviews*. Executive Office of the President Council on Environmental Quality. December 18, 2014.

Federal Emergency Management Administration (FEMA)

2019 Flood Map Service Center. Flood Map 47155C0244E. Effective May 18, 2019.

2020 Flood Zones. Accessed August 31, 2020. https://www.fema.gov/glossary/flood-zones

Federal Highway Administration (FHWA)

1986 *Design Standards for Highways in National Flood Insurance Program Mapped Floodplains*.

National Park Service, US Department of the Interior (NPS)

2002 *Procedural Manual 77-2: Floodplain Management*.

2016 *Procedural Manual #77-1: Wetland Protection*. Reissued June 21, 2016. https://www.nps.gov/policy/DOrders/Procedural_Manual_77-1_6-21-2016.pdf

2022 Great Smoky Mountains National Park. *Gatlinburg Spur Improvements Environmental Assessment*. Currently in development.

National Water Quality Monitoring Council (NWQMC)

2021 West Prong Little Pigeon River at Sevierville, TN site data in the Water Quality Portal. Accessed September 29, 2021. https://www.waterqualitydata.us/provider/NWIS/USGS-TN/USGS-03469900/

Tennessee Department of Environment and Conservation (TDEC)

2012 *Tennessee Erosion and Sediment Control Handbook: A Stormwater Planning and Design Manual for Construction Activities*. Fourth Edition. August 2012. https://tnepsc.org/TDEC_EandS_Handbook_2012_Edition4/TDEC%20EandS%20Handbook%204th%20Edition.pdf

United States Geological Survey (USGS)

2021 National Land Cover Database. Accessed January 14, 2022. https://www.usgs.gov/centers/eros/science/national-land-cover-database

2022 National Water Information System. 03469251 West Prong Little Pigeon River near Gatlinburg, TN. Accessed January 14, 2022. https://waterdata.usgs.gov/nwis/inventory/?site_no=03469251&agency_cd=USGS

Acronyms

EA	environmental assessment
FEMA	Federal Emergency Management Agency
HUC	Hydrologic Unit Code
NPS	National Park Service
Park	Great Smoky Mountains National Park
SOF	Statement of Findings
Spur	Gatlinburg Spur
TDEC	Tennessee Department of Environment and Conservation
West Prong	West Prong of the Little Pigeon River

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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 wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic 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. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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