

Concurrence

Point 4A Meeting

Avoidance and Minimization

NC 143 Improvements

From West Buffalo Creek to NC 143 Business, west of Robbinsville

Graham County

WBS No. 34508.1.1

STIP Project No. R-2822B



June 12, 2019
North Carolina Department of Transportation
Structures Design Conference Room C, NCDOT Century Center Building A
1000 Birch Ridge Drive, Raleigh, NC 27610

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Purpose of Today's Meeting

The purpose of today's meeting is to present the avoidance and minimization measures taken in support of the LEDPA.

Project Description

The North Carolina Department of Transportation (NCDOT) proposes to make safety improvements along NC 143 from West Buffalo Creek to NC 143 Business, near Robbinsville in Graham County. The project length is approximately 4.5 miles long. This project is included in the Draft NCDOT 2020 - 2029 State Transportation Improvement Program (STIP) as Project R-2822B.

NEPA/ Section 404 Merger Coordination History

Table 1: NEPA/Section 404 Merger Coordination History and Upcoming Meetings

January 23, 2007	Concurrence Point 1 (Purpose and Need) "The purpose of this action is to improve safety along NC 143 using context sensitive solutions."
December 16, 2010	Concurrence Point 2 (Detailed Study Alternatives) <ul style="list-style-type: none"> The project study area was revised to encompass the alignment for Alternative 2, which was the Section 4(f) Avoidance Alternative. This alternative was developed to avoid impacts to the Snowbird Picnic Area. Alternative 1, 2, and 4 were carried forward for detailed study.
May 8, 2013 March 25, 2015	Concurrence Point 2A (Bridging Decisions and Alignment Review) Project Coordination Meeting <ul style="list-style-type: none"> Informed the Merger Team of the reprioritization of the project which resulted in the project being unfunded.
July 20, 2017	Merger Update Meeting <ul style="list-style-type: none"> Project funding shifted from federal to state. NCDOT requested the introduction of an alternative using 3-R guidelines (requires revisiting CP 2/2A). USACE (lead agency) recommended revisiting CP 1 to reconstruct the purpose and need statement to [incorporate metrics into the concurrence form] establish safety screening criteria.
March 22, 2018	Concurrence Points 1,2, and 2A revisited <ul style="list-style-type: none"> Revise Purpose and Need and introduce Alternative 4A "The purpose of the project is to improve safety by achieving the minimum geometric standards consistent with the facility's functional classification."
November 2018	Concurrence Point 2A Revisited (see summary below) <ul style="list-style-type: none"> Replacement of Bridge #13 added to Alternatives 1, 2-Revised, and 4A.
March 20, 2019	Concurrence Point 2A and Concurrence Point 3

Review of LEDPA – Alternative 4A

- Upgrade NC 143 by from West Buffalo Creek to NC 143 Business by improving all vertical and horizontal curves to meet a minimum design speed of 35-mph. Improvements are consistent with the minimum recommendations for a rural collector as described in the NCDOT 3-R Guidelines.
- Includes widening NC 143 to 11-foot travel lanes and 6-foot wide shoulders (4-foot paved) in each direction. The 11-foot travel lanes are consistent with the minimum lane and shoulder width recommended by the NCDOT 3-R Guide.
- Replace Bridge #13 over Snow Bird Creek in its existing location using staged construction.

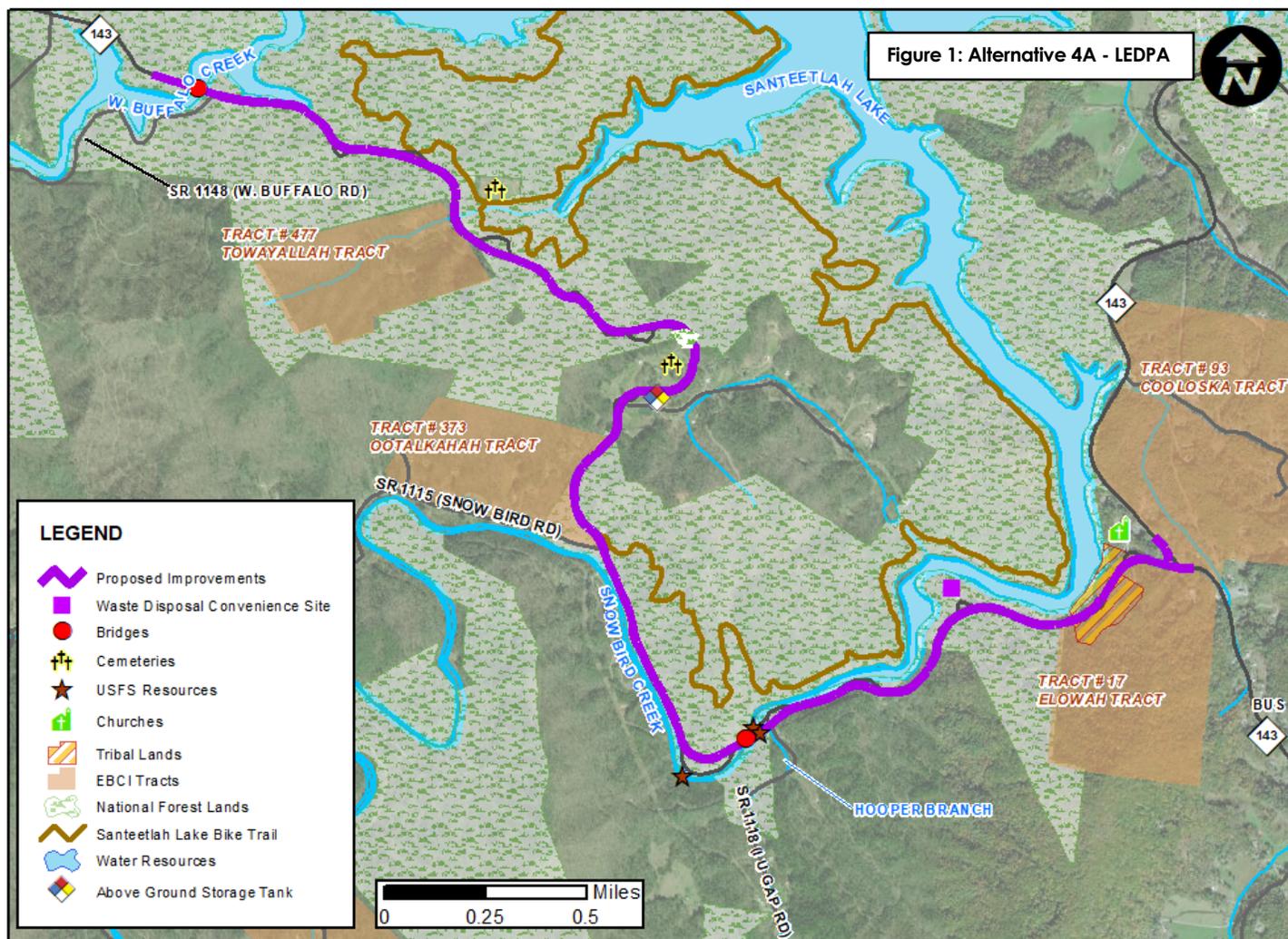


Figure 1: Alternative 4A - LEDPA

Environmental Commitments (from Concurrence Point 2A)

Division 14 and Roadside Environmental Unit (Aesthetics Engineering Section)

Replacement of Bridge #13 over Snowbird Creek will require the modification of the driveway access to the Snowbird Picnic Area. NCDOT will coordinate with the Forest Service to develop a revised driveway to the picnic area and remove or replace any structures that are affected by the bridge replacement or construction. NCDOT will add a vegetative planting plan in the scope of the project to mitigate the impacts to disturbed areas. NCDOT coordinate with the USFS botanist to develop a vegetative planting plan.

Division 14 and Hydraulics Unit

NCDOT will evaluate the feasibility of a bottomless hydraulic culvert at the Hooper Branch crossing. Geotechnical information is required to make a final determination. NCDOT will provide the Merger Team with final hydraulic recommendations during the CP 4B meeting. If a bottomless culvert is determined to not be feasible, CP 2A will be revisited.

Environmental Commitments (from Concurrence Point 3)

NCDOT Archaeology Section

NCDOT will conduct geophysical surveys of the Chickalee Cemetery to ensure boundaries are correctly delineated. If the surveys result in modifications to the cemetery boundary and the selected alternative results in potential impacts, the LEDPA decision will be revisited.



- Geophysical surveys were conducted by New South Associates and the findings were presented to NCDOT on May 9, 2019. The investigations noted no anomalies with characteristics that would be identified as possible graves found outside of the current boundaries of the Chickalee Cemetery.

Avoidance and Minimization

Context Sensitive Design and Best-fit Alignments

The application of Context Sensitive Design Controls and Criteria was included in the purpose and need of the project as a tool to assist the project team in the development of alternatives which would “fit their physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility¹.” The following Context Sensitive Design Controls and Criteria related to avoidance and minimization are being applied to the project:

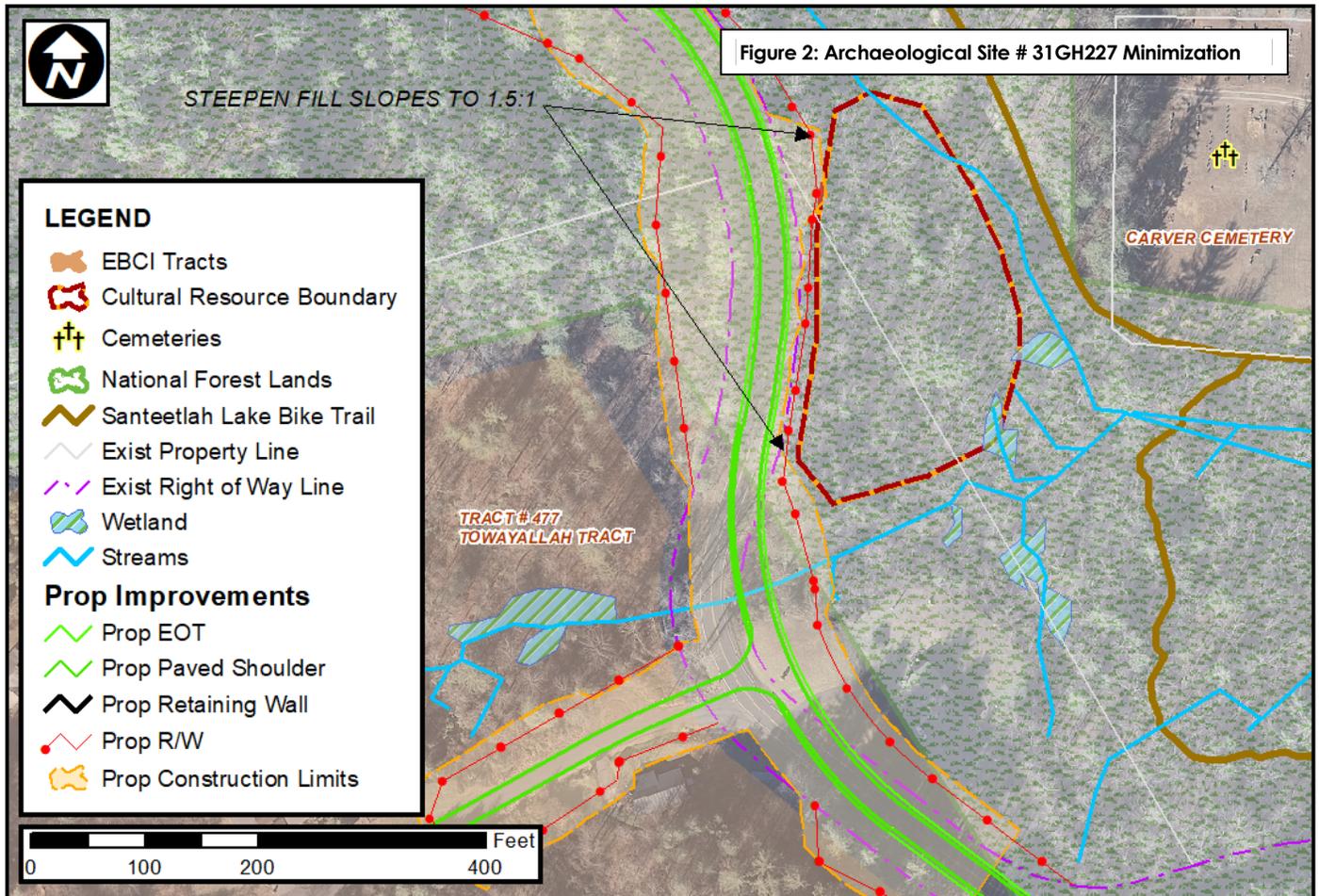
- **Design Flexibility and Exceptions:** Encourages highway designers to expand their consideration in applying the Green Book criteria.
- **Road Classification:** A design process integrating the principles of CSS emphasizes that as context changes, thoroughfare design should also change to support the activity generated by the context.
 - ✓ The purpose and need centered on the necessity of NC 143 to be brought up to the minimum geometric standards dictated by the roadway’s functional classification.
 - ✓ Through application of the two previously noted Context Sensitive Design Controls and Criteria, the build alternatives carried forward for detailed study were developed using either the AASHTO Greenbook or the NCDOT Resurfacing, Restoration, and Rehabilitation (3-R) Design Standards. The two design guides dictated different geometric requirements for a major collector; specifically design speed (45-mph versus 35-mph) and travel way width (40-foot versus 34-foot).
 - ✓ Having two design standards allowed for the development of multiple “best-fit alignment” alternatives that addressed the geometric deficiencies noted in the project purpose and need while being flexible enough to avoid or minimize impacts to adjacent human and natural environmental resources where possible.

¹ FHWA CSS Design Controls and Criteria (<https://www.fhwa.dot.gov/planning/css/design/controls/index.cfm>)



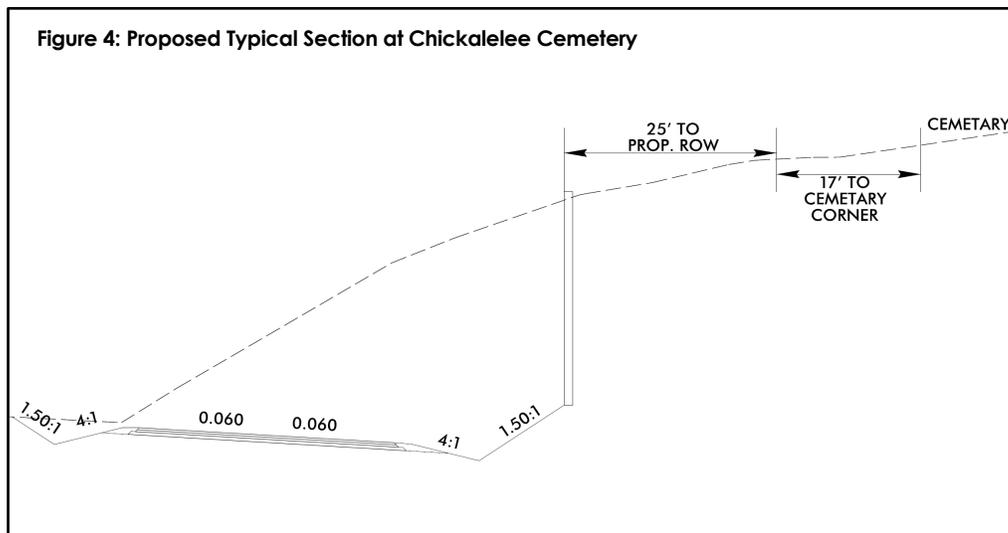
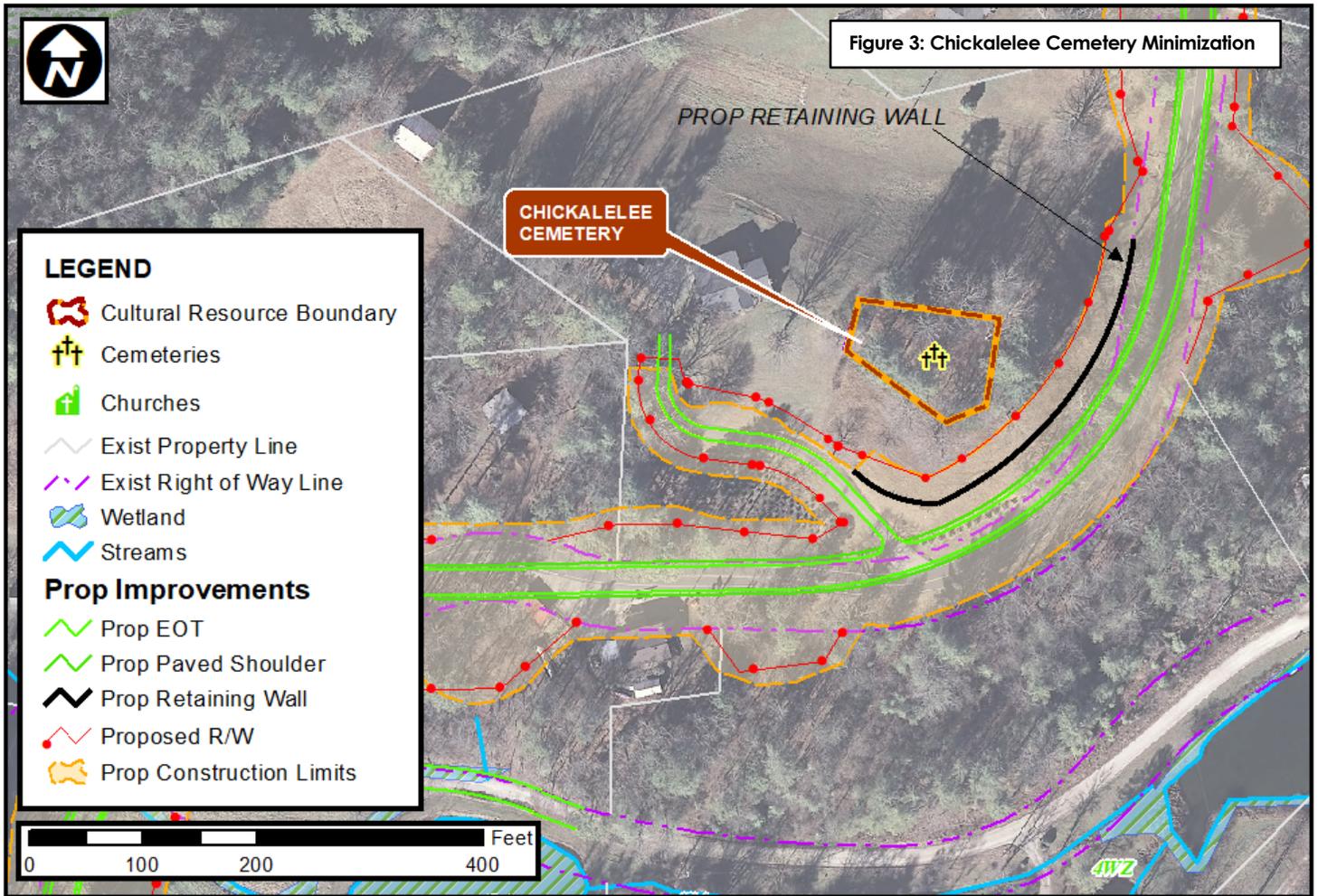
Archaeological Site # 31GH227

- The roadway curves, adjacent to the Towayallah Tract, are proposed to be realigned to provide a minimum design speed of 35 mph.
- In the vicinity of Site # 31GH227, fill areas will be constructed with slopes steepened up to 1.5:1. **This will eliminate impacts to the archaeological site.**



Chickalelee Cemetery

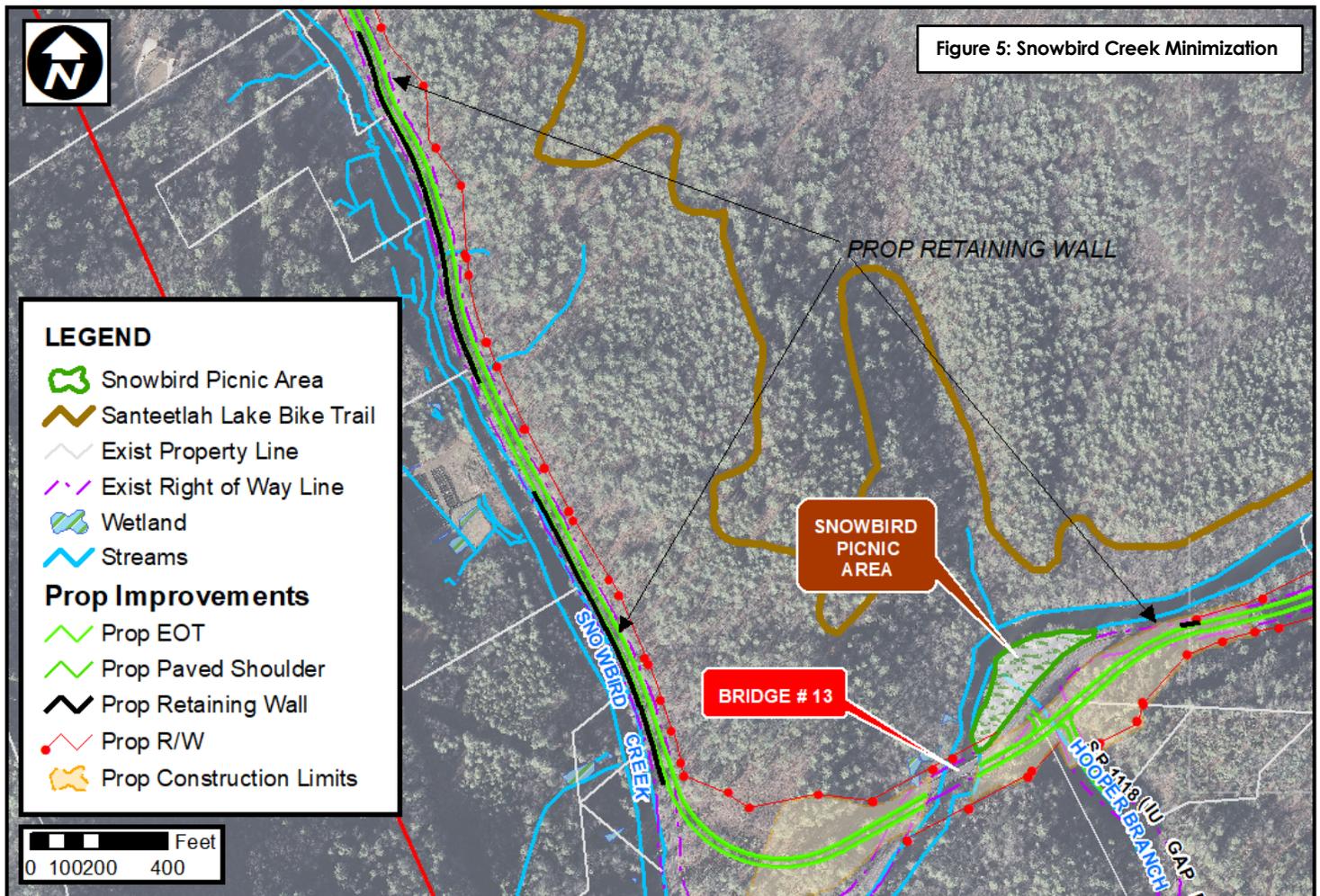
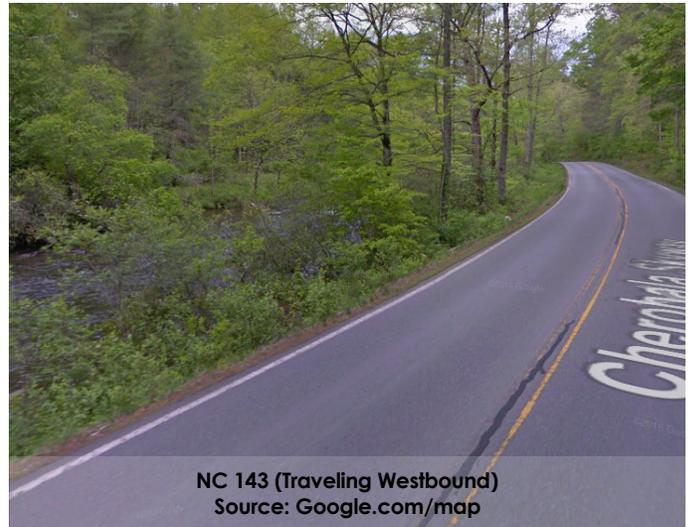
- NC 143 will be realigned (to meet a minimum 35-mph design speed) in the vicinity of the Chickalelee Cemetery, resulting in a cut along the eastbound side of the proposed alignment, just east of the Thunder Mountain General Store and deli.
- An approximately 385-foot long retaining wall with a maximum height of 25-feet is proposed to avoid impacts to the cemetery. Figure 3 shows the proposed typical section at the retaining wall location. The proposed right-of-way line will be a minimum of 17-feet from the outside edge of the cemetery boundary, providing a minimum of 42-feet between the wall and the cemetery. **Construction of the retaining will result in no impacts to the Chickalelee Cemetery.**





Snowbird Creek from SR 1115 (Snowbird Road) to east of SR 1118 (I U Gap Road)

- Between Snowbird Road and I U Gap Road, NC 143 closely parallels Snowbird Creek to the east.
- As alternatives were being developed for Concurrence Point 2, **approximately 2,050-feet of retaining walls were incorporated in the designs along the eastbound side of NC 143 to eliminate parallel stream impacts** due to the widened typical section as the roadway is wedged between the creek and the hillside.

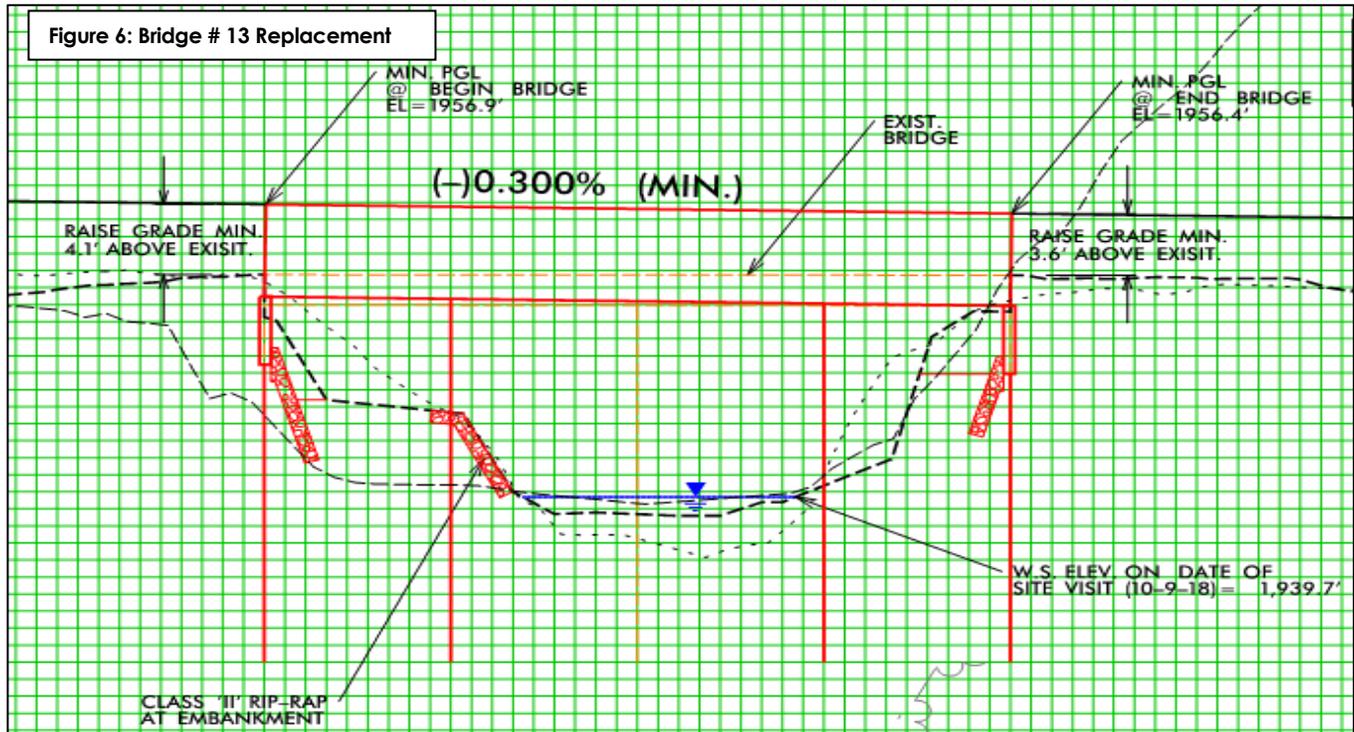




Replacement of Bridge #13 over Snowbird Creek

Snowbird Creek Bridge

- Bridge #13 will be replaced as part of the project using staged construction. The current bridge consists of four 45-foot long spans with two bridge piers currently in the bed of Snowbird Creek.
 - **The replacement structure will be a three-span structure with a 90-foot long center span, removing both center piers from the stream bed.**

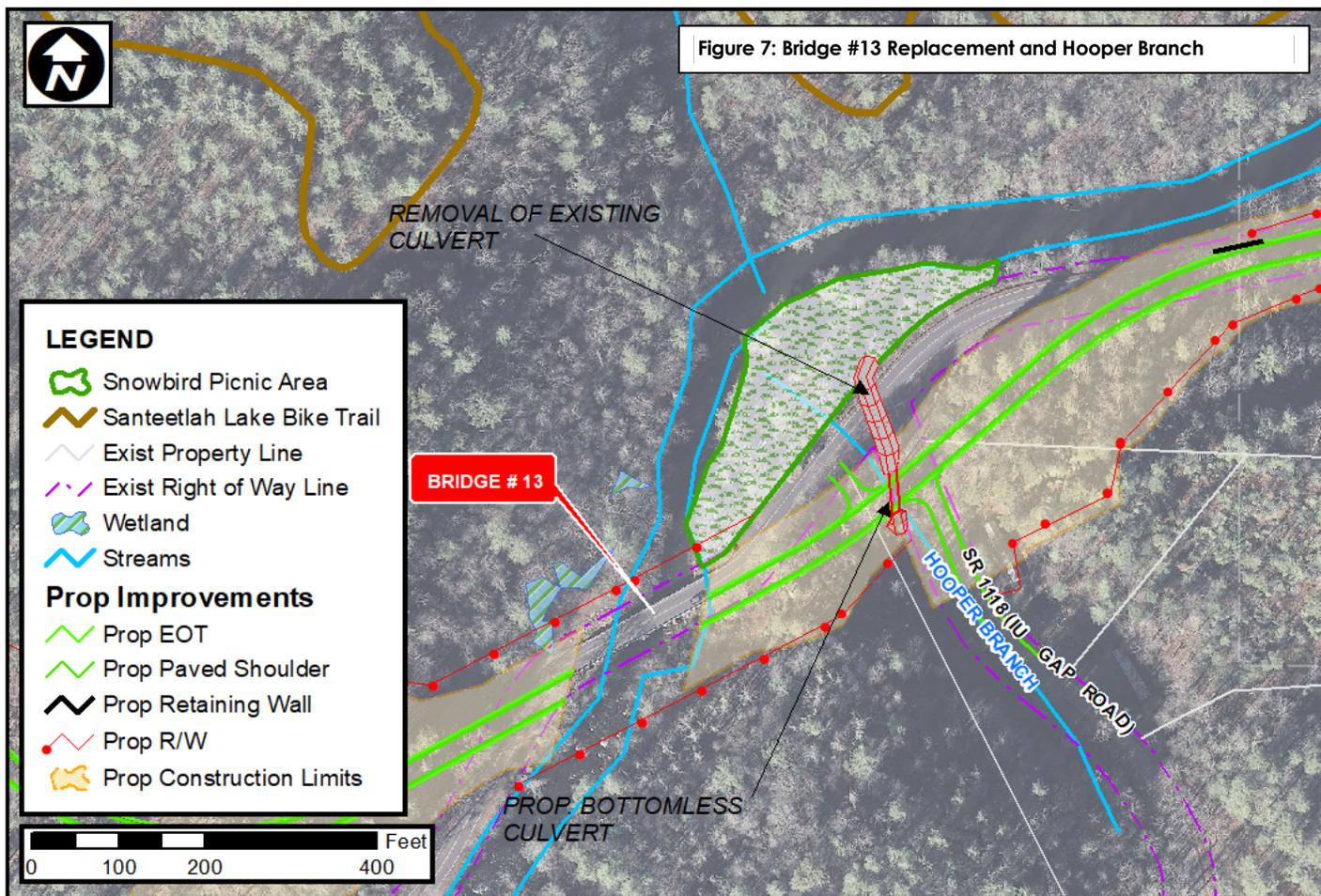


Hooper Branch

- The replacement of Bridge #13 will also result in a slight realignment of NC 143 at the intersection of SR 1118 (I U Gap Road), near the US Forest Service Snowbird Picnic Area.
- During the March 22, 2018 Combined CP 1, 2, and 2A Meeting, the Merger Team agreed that the existing 48-inch corrugated metal pipe (CMP) culvert would be removed and replaced with a 115-foot long, 8-foot x 8-foot reinforced concrete box culvert (RCBC). Due to the staged construction, the modified alignment would require a new approximately **60-foot long hydraulic structure at Hooper Branch instead of the previously recommended 115-foot long 8x8 RCBC. This would also allow for the removal of the existing 64-foot long, 48-inch CMP. This would reduce impacts to Hooper Branch by 55-feet and the day lighting of nearly 60-feet for stream.**
 - Per the request of the US Fish and Wildlife Service and the US Forest Service, **NCDOT agreed to evaluate the feasibility of a bottomless hydraulic structure at the Hooper Branch crossing.** The findings of this evaluation will be presented at the Concurrence Point 4B Meeting.

Snowbird Picnic Area

- As previously noted, the proposed replacement of Bridge #13 will realign NC 143 in the vicinity of the Snowbird Picnic Area (see Figure 3).
- The realignment would pull NC 143 away from the picnic area reducing the amount of property needing to be acquired from the forest service. This would also result in the abandonment of portions of the NC 143 right of way adjacent to the picnic area.



Residential and Business Impacts in Vicinity of NC 143/NC 143 Business Intersection

- Initially, the proposed design realigned the intersection of NC 143/NC 143 business to make NC 143 the primary through movement. This resulted in impacts to the following properties:
 - Buffalo Independent Baptist Church
 - Hunting Boy Wood Carving (Relocation)
 - 3298 Massey Branch Road (Relocation)
 - 2623 Snowbird Road (Relocation)
- In order to reduce property impacts in the vicinity of the NC 143/NC 143 Business intersection, it is recommended that the intersection be reconfigured as follows:
 - NC 143 west of the intersection is realigned to have a minimum design speed of 35-mph.
 - The skew at the NC 143 (west) approach to NC 143 Business is removed and a curve is introduced to create a 90-degree intersection, improving sight distance.
 - This modification will result in the following:
 - ✓ **Elimination of property acquisition from the Buffalo Independent Baptist Church**
 - ✓ **Hunting Boy Wood Carving no longer requires relocation**
 - ✓ **3298 Massey Branch Road no longer requires relocation**
 - ✓ **Reduction of 0.5 acres of impact to the Collooska Tract**

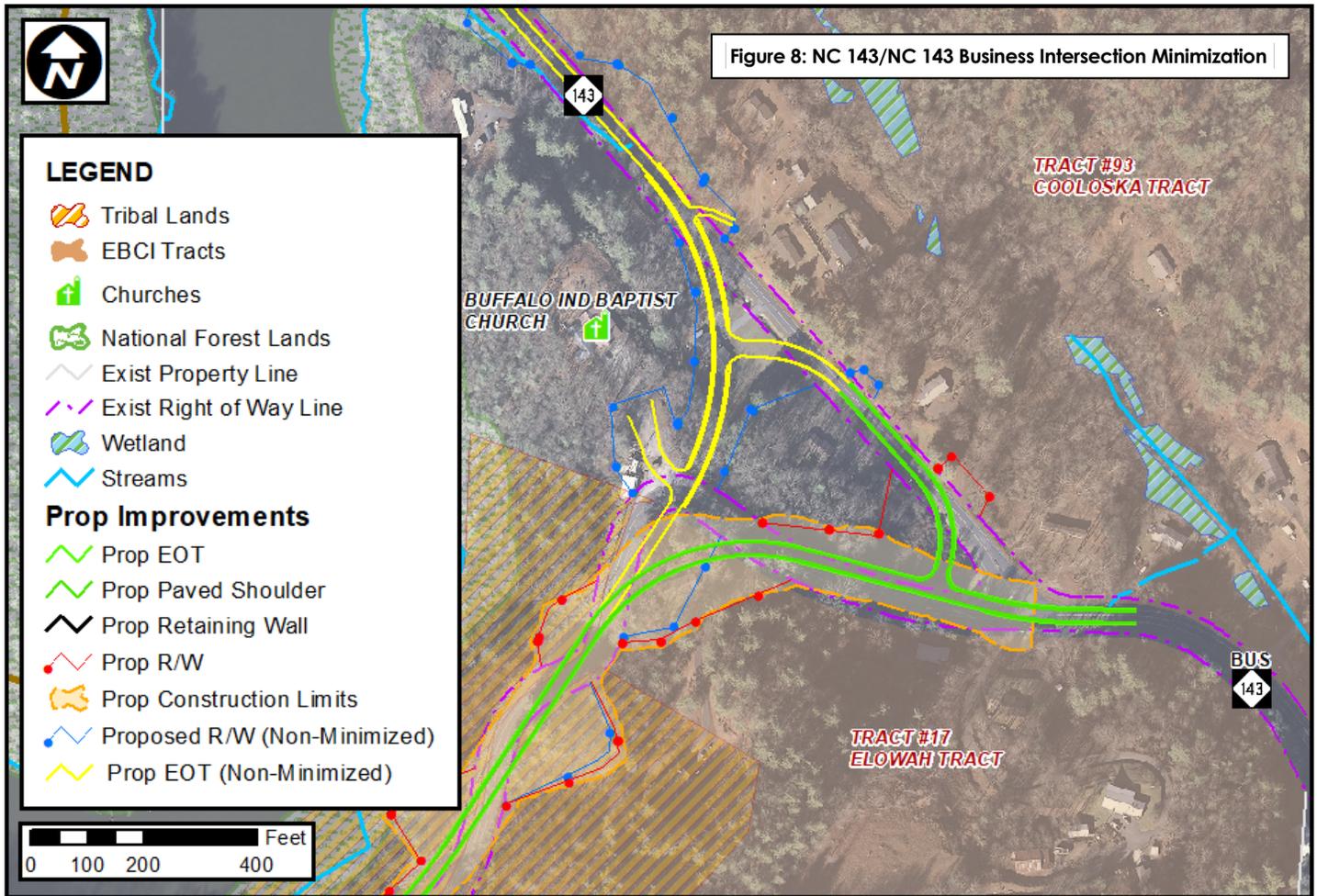


Table 2 provides a comparison of impacts between Alternative 4A (Non-minimized) and Alternative 4A (Minimized).



Table 2: Impact Comparison between Alternative 4A and Alternative 4A - Minimized

Resource	Alternative 4A (Non-Minimized)	Alternative 4A (Minimized)
Streams (linear feet)	3,250	3,200
Wetlands (acres)	0.08	0.08
Ponds (acres)	0.4	0.4
Trout Buffers (square feet)	82,930	82,930
Endangered Species	N	N
Cultural Resources		
Eastern Band of Cherokee Indian Tracts		
Towayallah Tract (acres)	3.0	3.0
Ootalkahah Tract (acres)	2.6	2.6
Elowah Tract (acres)	5.3	5.3
Collooska Tract (acres)	0.8	0.2
Total	11.7	11.1
Tribal lands (acres)	2.8	2.8
Indian Springs Cultural Washing Site	N	N
Origin of Snow Bird Legend Site	N	N
Chickalelee Cemetery	Y	N
NR - Archaeological Sites Impacts	Y	N
Other Cemeteries	N	N
NRHP- Eligible Historic Structures	0	0
Community Resources		
Residential Relocations (Estimated)	2	1
Business Relocations (Estimated)	3	2
Churches	0	0
Hazardous Material Sites	1	1
US Forest Service Resources		
Property Impacts (acres)	30.2	30.2
Santeetlah Bike Trail (linear feet)	480	480
Long Hungry Road Camping Area	N	N
Snowbird Picnic Area	Y	Y