**State of Georgia**

**Department of Transportation**

# Environmental Survey Boundary (ESB) Guidance

## ESB Guidance

9/13/2019

Revision 1.0 (Original Guidance)

Atlanta, Georgia 30308

GDOT Georgia Department of Transportation

# Revision History

| Revision Number | Revision Date | Revision Summary |
|---|---|---|
| **1.0** | 9/13/19 | Original Guidance |

# ENVIRONMENTAL SURVEY BOUNDARY (ESB)

## Environmental Survey Boundary (ESB)

An Environmental Survey Boundary (ESB) is an enclosed boundary shape (or shapes), produced by the design team, which defines the area to be field surveyed for environmental resources. To develop the ESB, the design team should first define a concept level approximation of the project's Right-of-Way (ROW) & Easement (ESMT) footprint. This concept level footprint should account for the width (including required ROW and ESMTs if applicable) and length (including extensions beyond begin/end project "termini" for tie-ins) of the proposed project. If the concept level footprint lands within the existing ROW, it should be pushed out to the existing ROW. The concept level footprint should also account for staging (including on-site detours and/or milling/restriping existing pavement), demolition, drainage, erosion control, MS4, etc. to the extent practical given the information known at the time. Once the concept level ROW & ESMT footprint is developed, the design team should offset this footprint by 100-ft to define the ESB:

ESB = Concept level ROW/ESMT footprint + 100-ft offset

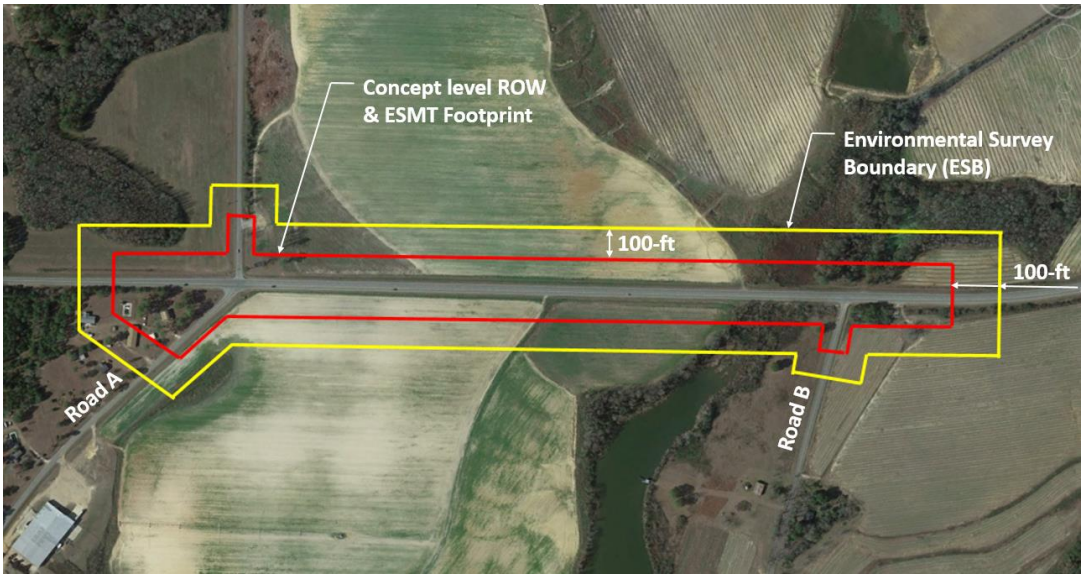


***Figure 1:*** *Schematic ESB example for a widening project from Road A to Road B. Note extensions beyond "termini" for tie-ins, block outs for sidestreets, and room for Road A to be realigned with a better skew angle.*

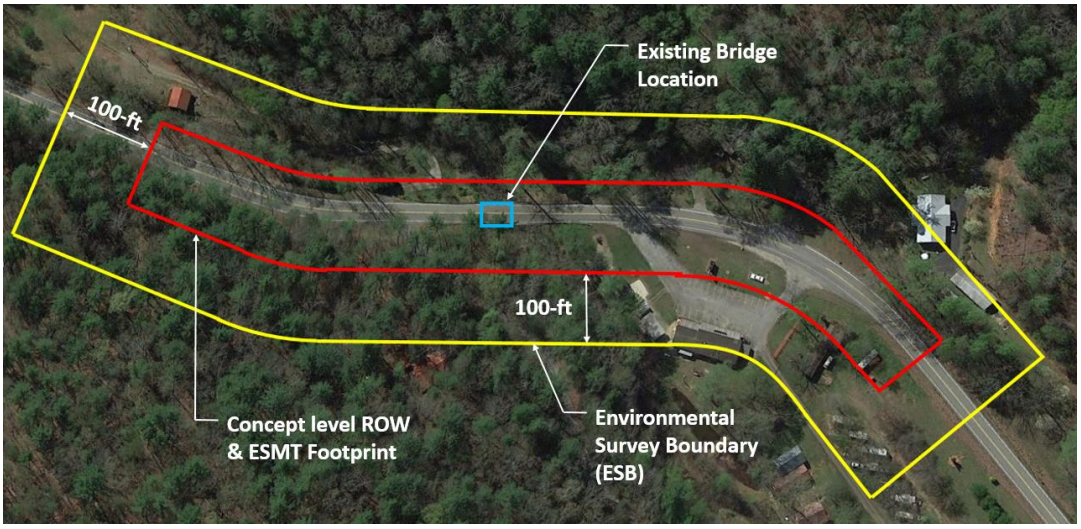


***Figure 2:*** *Schematic ESB example for a bridge replacement project. Note ESB reflects realignment to the east due to a known longitudinal perennial stream on the west, and no practical off-site detour option.*

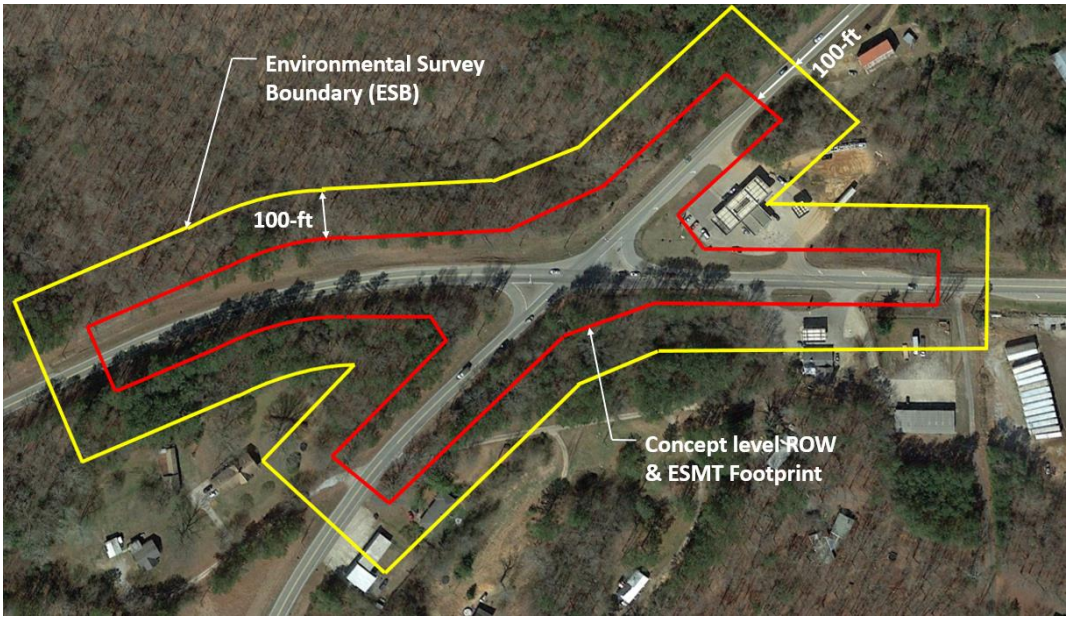


***Figure 3:*** *Schematic ESB example for an intersection improvement project to install a roundabout.*

The concept of an ESB is analogous to a topographic survey boundary; both boundaries are defined by the design team early in the project development so that other teams (environmental, survey) can collect existing field data within a clearly defined boundary. As a general rule of the thumb the ESB should not extend beyond the topographic survey boundary. The ESB and topographic survey boundary can both be considered as the extent where design can place the project without requiring additional survey information to be collected. One difference to consider is that a design which goes beyond the topographic survey boundary only requires one field trip to collect the additional information (survey), however a design that goes beyond the ESB will require field trips, reporting, and agency consultation from all environmental specialists (ecology, history, and archeology).

The ESB is typically created in the Concept phase of a project; there are P6 concept activities for submitting the ESB (in-house template design activity 19322) and receiving the ESB (in-house and consultant template environmental activity 11412), and there is a record plan set folder in ProjectWise (see workflow) for housing the layout.

The primary users of the ESB are environmental specialists, who will use the ESB as the boundary line inside of which they will identify environmentally sensitive areas (ESAs). The ESB applies directly to ecology and archeology resource identification due to the "ground" nature of these resources; the ESB applies indirectly to historic resource identification since viewsheds must also be considered. It is expected that Historians may need to go beyond the ESB according to their professional judgment.

The size of the ESB directly relates to the level of effort needed by environmental specialists to identify resources. Since this relates to scope and schedule, Project Managers should be considered secondary users of the ESB. The extent of the ESB will sometimes need to be "negotiated" among design, environmental, and the project manager so that a reasonable balance of risk and schedule are achieved; too large of a boundary results in time and money spent on unnecessary resource identification, too small of a boundary results in time and money spent sending out environmental specialists again to identify resources in the additional areas needed. For some larger scale projects, the design team may consider holding a brief pre-survey meeting or phone call to discuss the draft ESB and any concerns environmental specialists may have. There is no formal approval process for the ESB; it is recommended that the ESB and the potential need for a team discussion be included as agenda items in early monthly project status meetings. The formal submission of the ESB (in ProjectWise → Record Plan Sets) should happen after any such negotiations/meetings occur.

## Alternatives Analysis

For some larger scale projects, impacts to environmental resources (i.e. ESAs) can be a significant input into evaluating alternatives and selecting a preferred alternative. For smaller scale projects this may not be necessary in order to select the preferred alternative. Project team discussions should be held to reach consensus on which approach best fits a particular project. The design team should clearly indicate on the layout whether the ESB is intended to cover multiple concept alternatives, or just the assumed preferred alternative.

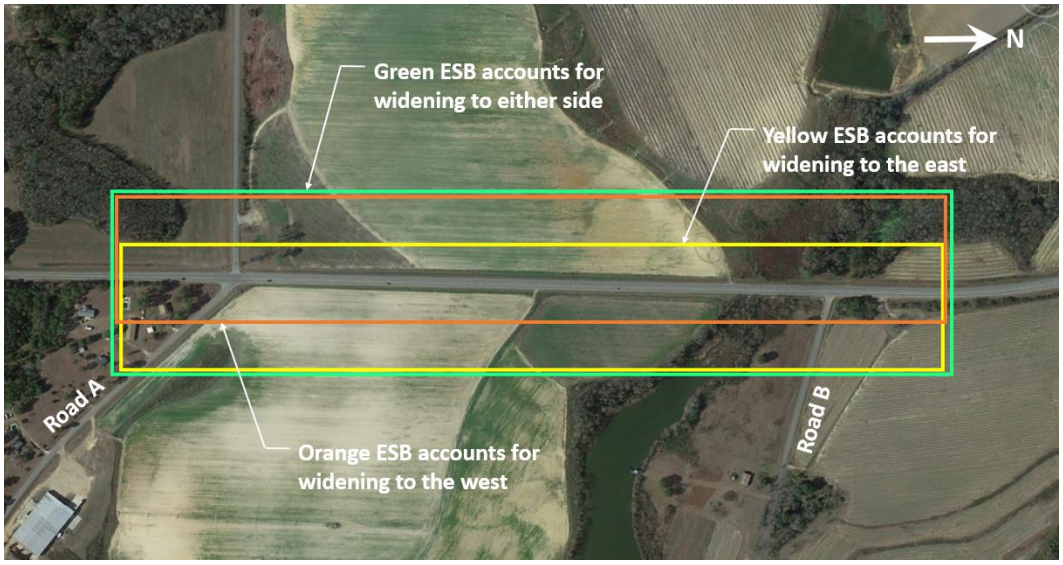


***Figure 4:*** *Schematic ESB examples for a widening project from Road A to Road B with respect to alternatives analysis. Unless the project team is aware of significant constraints on one side, for most projects the ESB should account for widening to either side to give the designers flexibility to avoid and minimize. For clarity, the concept level ROW & easement footprint is not shown in this figure.*

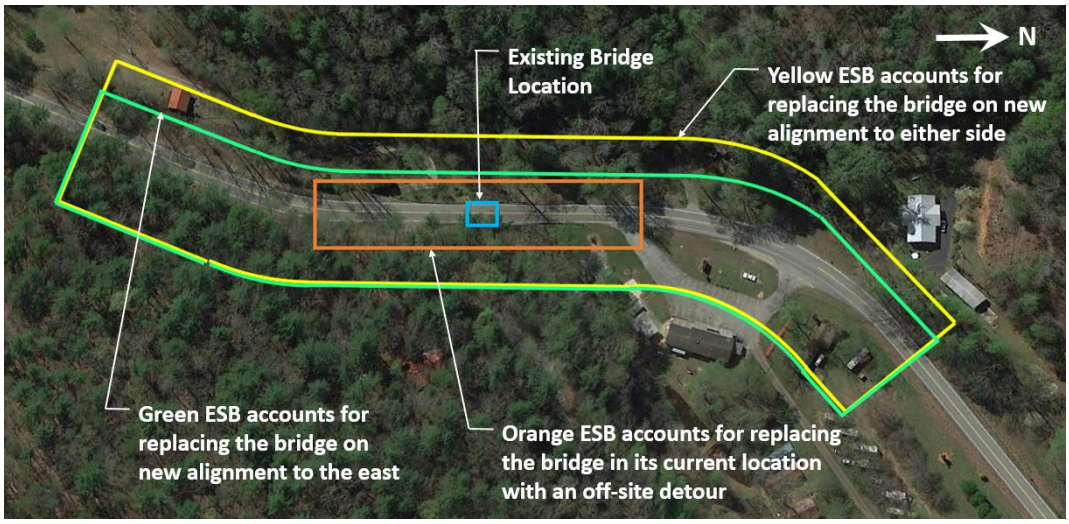


***Figure 5:*** *Schematic ESB examples for a bridge replacement project with respect to alternatives analysis. For clarity, the concept level ROW & easement footprint is not shown in this figure.*

## Scoping for Work Hour Estimates

In some cases, there may be a need to develop an ESB earlier than concept phase. One example of this would be for a "tier 1" (replace in kind) bridge replacement project, which utilizes an ESB for scoping/estimating work hours for contract procurement. In these cases, the table below can be used in the absence of additional available information.

| **Construction Method** | **ESB Length** (*Measured along roadway alignment)* | **ESB Width** (*Measured perpendicular to roadway alignment)* |
|---|---|---|
| Off-site detour | 2000'<br>(1000' each direction from bridge ends) | 400'-450' total<br>(200'-225' each side of exist CL) |
| On-site detour (temp. realign.) | 3000'<br>(1500' each direction from bridge ends) | 500'-550' total<br>(250'-275' each side of exist CL) |
| Permanent realignment | 4000'<br>(2000' each direction from bridge ends) | 500'-550' total<br>(250'-275' each side of exist CL) |

Notes:

- For rolling or mountainous terrain, consider increasing the total width by 50' – 100'
- For existing embankment heights greater than 40', consider increasing width by 50' – 100'
- The width of the ESB should, at a minimum, encompass the existing right-of-way
- If a design firm is under contact (or identified in-house), ESB to be set by designer based on project information

## Information to Include

- Legend:
  - PI# and/or Project #
  - Date
  - Title ("Environmental Survey Boundary")
  - Indication of ESB covering multiple alternatives or just assumed preferred
- Aerial photography background (may also provide on topo background if available)
- Graphic Scale and North Arrow
- Road Names
- Existing ROW and property lines, if available
- Concept Level ROW/ESMT footprint boundary with label
- Environmental Survey Boundary with label (offset 100-ft from concept level ROW/ESMT footprint boundary)
  - ESB should be georeferenced to the correct project location
- Provide dimensions and notes as needed to assist specialists in the field, e.g.:
  - ESB 250' from existing edge of pavement
  - ESB 500' beyond intersection of SR 1
- Anticipated begin/end project callouts
- ESB should be transmitted in both PDF and DGN format

## Miscellaneous Considerations

- ESB should encompass side roads, using the same approach philosophy as the mainline
- Interstate Guide Signs (Exit Ahead signs/Overhead Sign structures):
    - Typically apply to interchange projects (new interchanges or interchange reconstructions)
    - Typically also include a guardrail installation at these signs
    - Commonly overlooked item regarding project impacts in early stages
    - The ESB should attempt to define these areas, recognizing these challenges:
        - Topographic survey is typically not collected in these areas
        - Alignments are typically not defined in these areas
        - In the case of an interchange project, 3 discrete areas (ESBs) may need to be defined:
            - The “main” ESB covering the construction of the interchange
            - 2 or more smaller ESBs for the “exit ahead” signs
            - These areas should not be contiguous unless there is project work proposed in this area
- ESB does not need to account for temporary traffic control signage such as “Lane Closed 1 mile ahead”

## Results & Next Steps

The primary successor activity to submitting the ESB is the identification of environmental resources (AKA environmentally sensitive areas/ESAs). These ESA delineations are provided to the designers (environmental activity #11499, in-house Design #19349, Consultant Design #02439) for inclusion on layouts and project plans, to be discussed for the first time as a project team at the A3M (Avoidance & Minimization Measures Meeting – activity #20937).

The ESB should be used as the first Record Plan Set (see PDP Appendix O for details) for coordination between Design and Environmental team members. Once Preliminary Plans have been submitted to the Environmental team (in-house Design #21397, Consultant Design #23697) for Assessment of Effects, the project plans themselves become the Record Plan Set for coordination including the possible need for additional surveys later in the project; the ESB should generally not be revised/updated after this point. When the scope of a project changes significantly and/or a revised concept report is required which essentially restarts the design and environmental coordination process, a revised ESB should be developed.