THIRD INFANTRY DIVISION HIGHWAY CORRIDOR STUDY

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ABBREVIATIONS

ARD	Acid Rock Drainage
CWP	Construction Work Program
DOT	Department of Transportation
EIS	Environmental Impact Statement
EWG	Expert Working Group
FHWA	Federal Highway Administration
GDOT	Georgia Department of Transportation
GRSM	Great Smoky Mountains National Park
ISTEA	Intermodal Surface Transportation and Efficiency Act
LRTP	Long Range Transportation Plan
MPO	Metropolitan Planning Organization
NCDOT	North Carolina Department of Transportation
NEPA	National Environmental Policy Act
NWR	National Wildlife Refuge
PS&E	Plans, Specifications, and Estimates
ROD	Record of Decision
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation: a Legacy for Users
SIU	Section of Independent Utility
STIP	Statewide Transportation Improvement Program
STRAHNET	Strategic Highway Network
TDOT	Tennessee Department of Transportation
TIP	Transportation Improvement Program
TPR	Transportation Planning Report (term specific to Tennessee)
TVA	Tennessee Valley Authority

THIRD INFANTRY DIVISION HIGHWAY CORRIDOR STUDY

Conceptual Feasibility Report

June 16, 2011

EXECUTIVE SUMMARY

Section 1927 of the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU) (P.L. 109-59) requires "a report that describes the steps and estimated funding necessary to designate and construct a route for the 3rd Infantry Division Highway," extending from Savannah, Georgia, to Knoxville, Tennessee, by way of Augusta, Georgia. The intent of this study is to develop planning level cost estimates for potential corridors connecting these urban areas. The study is not intended to select an alternative for implementation nor will it lead to any further planning, design, right-of-way acquisition, or construction activities for any specific highway improvement unless state and regional policy-makers determine additional action is warranted.

Seven major work elements were undertaken as part of this study.

1. Collecting an inventory of existing data sources
2. Identifying control points as "wickets" through which all potential corridors must pass
3. Developing corridors between these control points
4. Screening against "fatal flaws" to identify significant obstacles to implementation
5. Developing design levels to describe the intended function of the proposed route
6. Preparing cost estimates and identifying project development steps
7. Collecting and incorporating feedback from stakeholders and the public

An Expert Working Group (EWG) was assembled to provide technical direction and unstructured opinions on various aspects of the study, composed of State and regional transportation representatives, Federal resource agencies, and one organized opposition group. The EWG met regularly throughout the study to guide and inform decisionmaking.

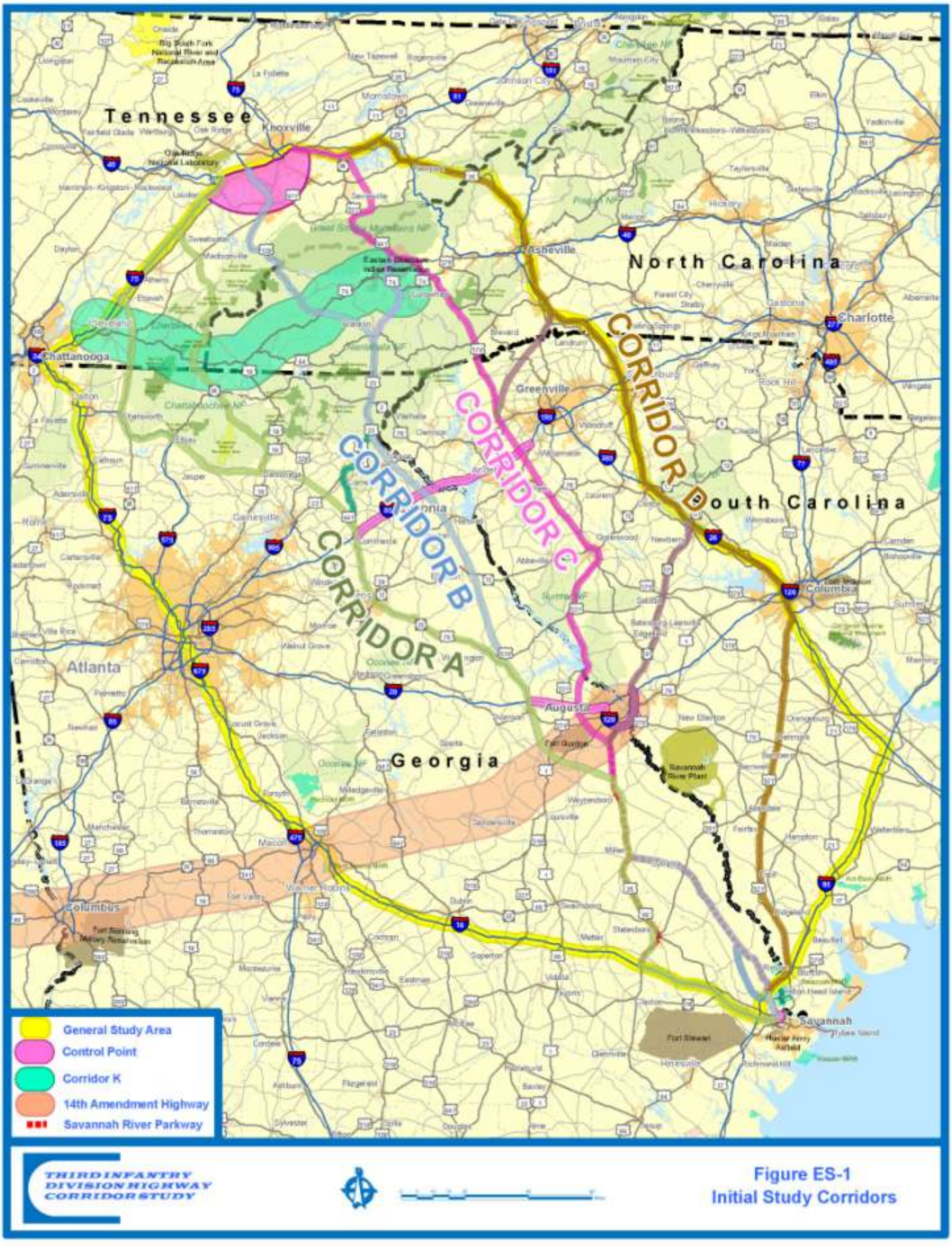
Conceptual Highway Corridors

The legislation identified three control points through which corridors must pass: Savannah, Georgia; Augusta, Georgia; and Knoxville, Tennessee. The Federal Highway Administration (FHWA) added a control point at Lavonia, Georgia, to facilitate corridor development while avoiding impacts to Great Smoky Mountains National Park. The consultant team relied on engineering judgment and recommendations from EWG members to define the study area and geographic boundaries for individual control points. The team identified four conceptual corridors to represent the range of potential connections between control points, as described in **Table ES-1** and shown in **Figure ES-1**.

Table ES-1: Description of Corridors Developed

Corridor	Description
Corridor A	Farthest west option, running along I-16 west out of Savannah, passing west of Augusta, passing east of Athens, GA and Gainesville, GA. A western option follows the western boundary of the National Forests to I-75 at Cleveland, TN; an eastern option crosses through the National Forests north of Dahlonega, GA to join I-75 at Sweetwater, TN.
Corridor B	Follows the Savannah River Parkway from Savannah, running west of the Georgia/South Carolina State line, and following existing roadways through the National Forests and along the western boundary of the Great Smoky Mountains National Park to Knoxville. A bypass of SR 21 at Savannah was also considered for this corridor.
Corridor C	Follows the Savannah River Parkway from Savannah, following new and existing alignments through South Carolina from Augusta to west of Greenville, and crosses through the National Forests and the Great Smoky Mountains National Park on existing alignments
Corridor D	Follows existing alignments from Savannah to Columbia, following I-26 and US 25 north and west to Knoxville

These corridors were screened against "fatal flaws" to identify significant obstacles to implementation which effectively make a corridor infeasible or unreasonable for further study. The density of natural resources, the vast area protected by State or Federal designations, and aggressive terrain features throughout the northern portion of the study area create numerous challenges to highway development. Within the study area, vast tracts of land are protected as National Forests, National Parks, federally designated Wilderness Areas, wildlife conservation areas, and by other designations. Rugged topography and other geotechnical issues create constructability issues for alignments passing through the Appalachian Mountains. In addition, a number of regional residents and organizations have been outspoken about their desire to protect natural and cultural resources by limiting development.


Tennessee
Knoxville
North Carolina
Asheville
Charlotte
Chattanooga
Greenville
South Carolina
Columbia
Atlanta
Augusta
Georgia
Savannah
Columbus
CORRIDOR A
CORRIDOR B
CORRIDOR C
CORRIDOR D
General Study Area
Control Point
Corridor K
14th Amendment Highway
Savannah River Parkway
THIRD INFANTRY DIVISION HIGHWAY CORRIDOR STUDY
Figure ES-1
Initial Study Corridors

The fatal flaw screening eliminated corridors from further consideration within this conceptual corridor study which would impact National Parks, pass through extreme mountainous terrain, or do not connect each of the control points. Screening against these metrics, the northern portion of Corridor B and entirety of Corridors C and D were deemed unreasonable and eliminated from further consideration. As a result, Corridor A and the southern portions of Corridor B/B Bypass were advanced for cost estimates. In the opinion of the EWG, these represent the "least objectionable" options of the corridors considered. A Signing Only Alternative that would install signage on an existing Interstate route was suggested by the EWG and was also advanced for cost estimates.

Four design levels were applied to corridors passing the fatal flaw screening.

- The Interstate Design Level provides two travel lanes per direction, designed to Interstate standards, with grade-separated interchanges for major cross streets. Special sections (such as tunnels or viaduct) may be incorporated to minimize impacts.
- The Arterial Design Level provides a four-lane, divided highway with at-grade intersections and access control.
- The Super-2 Design Level provides an enhanced two-lane highway where a third lane is added for passing, turning, or truck climbing as needed. Intersections are at-grade.
- The Minimal Build Design Level incorporates minimal improvements to existing alignments combined with new two-lane highways on new alignment to provide a continuous route along a chosen corridor.

Planning-Level Cost Estimates

The project team employed cost estimating methodologies developed by the Georgia and Tennessee Departments of Transportation (GDOT and TDOT) to forecast planning-level cost estimates for the corridors passing the fatal flaw screening. Each State model provides unit costs for preliminary engineering, right-of-way, utilities, and construction, with adjustment factors to account for project types, land use/location, and other variables that influence costs.

Using methodologies developed by TDOT and GDOT, planning-level cost estimates were prepared for the different corridor options to represent the 3rd Infantry Division Highway:

- Corridor A West for the entire 435-mile length from Savannah to Knoxville
- Corridor A West with an I-75 spur at Dalton, Georgia, eliminating the section between Chatsworth, Georgia, and Knoxville
- Corridors B and B Bypass from Savannah to Millen, Georgia, coupled with Corridor A West north of Millen
- Signing Only Alternative

Costs were developed to reflect each design level. The full Corridor A West option is estimated to cost between $700 million and $4.8 billion. The cost range accounts for the design level of improvements to the corridor and is not a risk-based probabilistic approach. See **Table ES-2** for a detailed cost breakdown of Corridor A West. **Table ES-3** provides a comparison of the other corridor options at each design level.

Table ES-2: Corridor A West Total Costs by Phase and Design Level (2010 Dollars)

	Min. Build	Super-2	Arterial	Interstate
Engineering	$65 million	$113 million	$237 million	$468 million
ROW	$68 million	$108 million	$313 million	$576 million
Utility*	$73 million	$176 million	$198 million	$252 million
Construction	$483 million	$790 million	$1.716 billion	$3.680 billion
TOTAL**	**$701 million**	**$1.216 billion**	**$2.501 billion**	**$4.845 billion**
GA Total	$564 million	$902 million	$2.099 billion	$4.316 billion
TN Total	$137 million	$314 million	$402 million	$529 million

** Utility costs presented for GA portion only; TN utility costs included in construction category*
*** Additional 10% contingency added to total project costs within TN*

Table ES-3: Comparison of Total Corridor Costs (2010 Dollars)

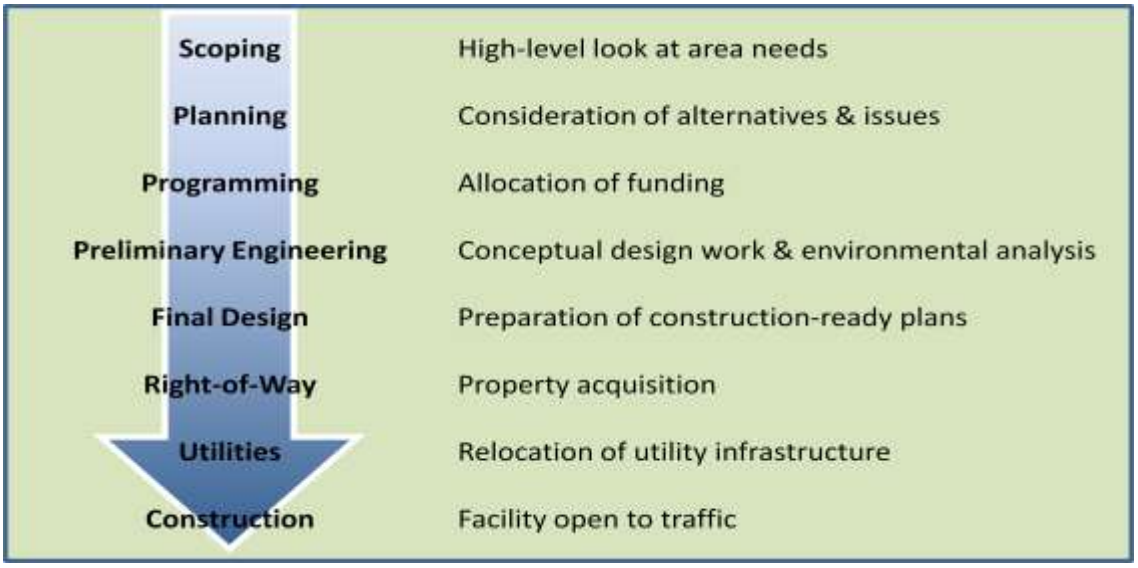
Corridor	Min. Build	Super-2	Arterial	Interstate
A West	$701 million	$1.2 billion	$2.5 billion	$4.8 billion
A West (Dalton spur)	$564 million	$874 million	$2.0 billion	$4.2 billion
B/A West	n/a	n/a	$2.5 billion	$5.2 billion
B Bypass/A West	n/a	n/a	$3.1 billion	$5.9 billion
Signing Only	n/a	n/a	n/a	< $500,000

Steps Required to Construct

This section provides a high-level overview of the complex sequence of steps required to construct a major, environmentally sensitive highway improvement project. Although all States have technical processes to identify, plan, design, and construct a highway improvement, each also has special requirements based on individual administrative, regulatory, and legislative requirements. It is often not practical to improve the entirety of a lengthy corridor at once; the corridor must be divided into manageable sections. Federal regulations require that each section to be constructed has independent utility with logical termini even if the remainder of the proposed corridor improvements were not completed. In this way each section advances through a similar process as funding becomes available.

The eight steps shown in **Figure ES-2** outline the essential stages for improvement projects similar to the proposed 3rd Infantry Division Highway. Details of each step are provided in later sections of this report.

Figure ES-2: Major Project Development Phases



These steps represent a logical progression through transportation decisionmaking; however, the timeline can vary dramatically between projects. According to a 2002 testimony before the Senate Committee on Environment and Public Works, it generally takes 9 to 19 years to plan, gain approval for, and construct a highway project with significant environmental impacts; larger, more complex, or controversial projects can take longer. The environmental analysis phase alone takes an average of 6 years to complete. As part of the FHWA's *Every Day Counts* initiative, project delivery timelines are being shortened through enhanced technical support.

Consensus building among diverse stakeholders and the priority of the project statewide can greatly influence the project timeline.

- Transportation decisionmaking requires ongoing collaboration and agreement between partners and stakeholders in order to result in a highway improvement project that can be implemented. Each partner and stakeholder brings their own interests and needs to decisionmaking. Federal regulations require that all interests and needs are recognized and considered in a robust way at many individual steps in the process. For example, public involvement is mandated at specific points during the programming, planning, and environmental analysis stages. Without public support at these key points, a proposed improvement can be permanently stopped or delayed for months or years. For the 3rd Infantry Division Highway to be implemented, there must be consensus across the study area of the corridor's value and necessity.
- Funding for transportation improvements is limited and must be used to meet needs which are the highest priorities for States and metropolitan areas. For any individual project to advance through each of the eight major project development steps, it must be considered a priority among competing needs for an entire region or State.

A multistate project such as the 3rd Infantry Division Highway represents many individual projects across different regions within one or more States. Each independent section must advance through the project development process:

1. Project Identification and Scoping includes a high-level look at needs and deficiencies, either within a transportation network or along a specific route. This can be accomplished at a statewide, regional, or corridor scale. A key element is the development of a preliminary *Purpose and Need Statement* that describes the need for a proposed project and how the proposed project will meet that need. Until decision-makers have a thorough understanding of the transportation needs, it is premature to determine whether an improvement project should be pursued. Scoping is done in conjunction with project identification or subsequent to an agreement that an improvement is needed. This step involves the identification of relevant plans, projects, stakeholders, and other information that helps build a full understanding of the project limits and preliminary funding requirements.

2. If funds are available, a project enters the Planning phase. Planning may occur at a State or regional level for an entire corridor and/or at a project-specific level for individual project sections. This usually includes refinement of the preliminary *Purpose and Need Statement*, development of recommended design criteria, an overview of environmental and community resources, development of conceptual alternatives, a discussion of engineering issues, preliminary estimates of costs, public/agency involvement efforts, and a number of other tasks. Prior to further development, a project must be funded in the Statewide Transportation Improvement Program (STIP) or Transportation Improvement Program (TIP).

3. Programming involves allocation of funding for a defined project. This usually occurs when a project has been identified within a statewide or regional long-range transportation plan, but may occur earlier to determine feasibility. The TIP or STIP represents the allocation of Federal funding. Funding identified in the TIP must come from a recognized funding source such as State or Federal transportation funds. State and local funding for projects may be allocated separately. A corridor such as the 3rd Infantry Division Highway requires agreement at both the regional and State levels in order to allocate Federal funding in the TIP because it crosses many jurisdictional boundaries. Programming is an incremental process since funds are limited and a project must pass through multiple phases of activity, spaced over several years.

4. Preliminary Engineering and Environmental Analysis is the next step in the development process. This effort includes preparation of conceptual designs, engineering studies, and environmental studies at a higher level of detail than work occurring during the Planning phase. Alternatives are developed and their impacts are evaluated, in accordance with the

National Environmental Policy Act (NEPA) and other laws and Federal regulations. As with the planning stage, this phase involves extensive public and agency involvement measures. Completion of the project's Environmental Impact Statement (EIS) and Record of Decision (ROD) constitutes Federal approval of the location of the project. Recent trends to link Planning efforts to the Preliminary Engineering and Environmental Analysis phase can reduce the project development timeline, streamlining these processes to integrate previously discrete work elements.

5. After environmental approval is granted, Final Design can begin, which results in the detailed plans, specifications, and estimates necessary to prepare a construction contract. Designs for right-of-way, roadway geometry, drainage, staging, erosion, lighting, signs, pavement markings, utilities, structures, and a number of other elements are finalized in this phase. It is also necessary to obtain permits from Federal resource agencies such as the Environmental Protection Agency, the U.S. Coast Guard, and the U.S. Army Corps of Engineers, in addition to any State permits required for construction.

6. Right-of-Way Acquisition occurs next, in which the State department of transportation (DOT) or local government purchases necessary parcels, properties, and easements that will be required to construct the project.

7. Utility Relocation involves relocating any utilities which will be impacted by the project. This work is coordinated extensively with the utility service provider to minimize impacts to service.

8. Finally, Construction includes construction engineering, materials testing, inspection, and other work directly related to administration of the contract. Contractors are required to maintain traffic flow along existing roadways to preserve access to adjacent properties, which can have impacts on construction schedules and methods.

Once a roadway is open to traffic, it is the responsibility of the owner (the State DOT or local government) to maintain traffic operations along the facility for its service life.

Public Involvement

Because of the conceptual nature of the study and large geographic area concerned, a project Web site was the primary venue for public involvement, providing a project-specific form that users can complete to submit comments and concerns electronically. As of June 15, 2011, 229 comments have been received. Although 15 messages have been received in support of a project, the vast majority of comments oppose further development of any corridor. Four key themes emerged from the public comments received:

- Construction of a new highway or Interstate would lead to significant impacts to the natural environment, including impacts to National Forests, wildlife habitats, mountains, scenic beauty, and more.
- Construction of a new highway or Interstate would compromise quality of life for residents. The rural character and scenic beauty of the region are essential qualities that attract residents and tourists.
- No purpose or need for the project has been demonstrated or provided to the public.
- Costs for a project far outweigh perceived benefits and should be considered in light of current transportation financing shortfalls and the current national debt. Funding for the project should end with the completion of this Phase I report.

Three online question and answer sessions were hosted during May 2011 to engage interested parties. Each Webinar featured a brief presentation about the study process, followed by an opportunity for participants to ask questions of the project team. A total of 50 individuals attended the three events.

Conclusions

A new or improved corridor between Savannah, Augusta, and Knoxville has not been identified in any State DOT or MPO long-range plan.

A new highway corridor from Savannah to Knoxville would result in significant costs, both financial and environmental. This Southern Appalachian region contains a dense mixture of small mountain communities, sensitive environmental resources, and federally managed lands.

Analysis suggests corridors located farther west face fewer environmental and terrain challenges than corridors located in the center or eastern portions of the Study Area. However, significant resources impacts are likely to result from any alternative.

Numerous members of the public have expressed their opposition to this corridor concept and to other new highways proposed in the region.

Conceptual Feasibility Report

June 16, 2011

1.0 BACKGROUND

Section 1927 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (P.L. 109-59) requires development of "a report that describes the steps and estimated funding necessary to designate and construct a route for the 3rd Infantry Division Highway," extending from Savannah, Georgia, to Knoxville, Tennessee, by way of Augusta, Georgia.

The intent of this conceptual feasibility study is to develop planning level cost estimates for potential corridors connecting these urban areas. The study is not intended to recommend any specific alternative for implementation; it will not lead to construction of any specific highway improvement unless State and local transportation decisionmakers determine that additional project development activities should be pursued. The 3rd Infantry Division Highway Corridor has not been designated as a future Interstate, and there is currently no funding identified to support long-range planning, environmental review, design, right-of-way acquisition, utilities relocation, or construction beyond the initial funding made available for this study. To proceed further, these activities must be initiated at the State or regional level.

The study does not recommend whether or not to build a project in the corridor. It does not recommend a preferred alignment or design level.

1.1 History of the Proposed Corridor

The 3rd Infantry Division Highway Corridor is commonly referred to as "I-3" by locals in the States of Georgia, North Carolina, and Tennessee. Originally proposed by the Georgia delegation to the U.S. Congress in 2004, I-3 was intended to serve the following purposes:

- Link military facilities across the South, such as Fort Gordon, Eisenhower Army Regional Medical Center, the Augusta Veterans Administration Hospitals, Fort

Stewart, and Hunter Army Airfield, "which is in the strategic defense interest of the Nation" as an addition and enhancement to the existing nationwide Strategic Highway Network.

- Enhance economic development because "East Georgia, Western North Carolina, and the Great Smoky Mountains region of Tennessee are underserved by north-south Interstate highways, and [these regions] would benefit economically and through increased public safety by establishment of an Interstate highway."

The Georgia delegation initiated two bills, S. 459 and H.R. 301, directing that: (1) a new Interstate highway (formerly the Savannah River Parkway) designated as "United States Interstate Route 3" should be constructed between Savannah, Georgia, and Knoxville, Tennessee; and (2) such highway should be known and designated as the "3rd Infantry Division Highway," in honor of the U.S. Army 3rd Infantry Division. The bills directed the U.S. Secretary of Transportation to study and report to the appropriate congressional committees on the steps and estimated funding necessary to designate and construct a new Interstate route for the 3rd Infantry Division Highway. Neither bill passed.

However, on August 10, 2005, legislation to study the corridor was signed into law as part of SAFETEA-LU. Although SAFETEA-LU does not designate the 3rd Infantry Division Highway as an Interstate or future Interstate, it does provide funding for the consideration of a new Interstate following the proposed 3rd Infantry Division Highway route. The Federal Highway Administration (FHWA) Office of Planning refers to the 3rd Infantry Division Highway as a “corridor” since the highway is not currently designated as a future Interstate and because no preferred alignment for the highway has been established. A corridor denotes a broad geographic band following major movements (e.g. passenger car trips, freight flows, transit links, etc), rather than a specific roadway type or path.

A press release about the project in late spring 2005 generated substantial concern in the southern Appalachian area. In northeast Georgia, the Towns County Homeowners Association organized a general meeting in May 2005. An estimated 650 citizens attended the meeting; of the 30-40 stakeholders who spoke at the event, none were in favor of the proposed project. Later meetings elsewhere in Georgia and North Carolina occurred, again eliciting general outcry from attendees. Unofficial polls during 2006-2007 indicated an estimated 90 percent of northeastern Georgia residents were opposed to the proposed project; numerous counties in north Georgia and western North Carolina have officially announced their opposition to the project. None of the Metropolitan Planning Organizations (MPOs) in the region have included the project in their planning documents or expressed support for the general corridor concept. Fed by public opposition, several regional non-profit environmental protection organizations have joined the opposition campaign.

This conceptual feasibility study was initiated in 2010 to satisfy the statutory language that the FHWA carry out a study to document the steps and estimate the funding needed to designate and construct a route between Savannah and Knoxville.

1.2 Adjacent Major Corridors under Development

Two other major corridors have been identified within the study area for the 3rd Infantry Division Highway corridor. These are noted below and should be coordinated during any future project development activities which may be deemed necessary.

Also required by Section 1927 of SAFETEA-LU, a conceptual feasibility study for the 14th Amendment Highway corridor is being conducted concurrently with the 3rd Infantry Division study. The 14th Amendment Highway is proposed to extend from Augusta, Georgia, to Natchez, Mississippi, servicing intermediate cities of Macon, GA; Columbus, GA; and Montgomery, AL. A portion of the highway corridor in Georgia was designated as a Congressional High Priority Corridor under Section 1105(c) of the Intermodal Surface Transportation and Efficiency Act (ISTEA) of 1991. The segment from Columbus to Macon was previously studied by the Georgia Department of Transportation (GDOT) as part of the Governor's Roadway Improvement Program.

Corridor K, part of the Appalachian Development Highway System, has been under development since the 1980s. The proposed corridor runs from I-75 near Cleveland, Tennessee, to near Dillsboro in western North Carolina. The Tennessee Department of Transportation (TDOT) completed a *Transportation Planning Report* in 2010 for the Tennessee portion of the route (US 64 from west of the Ocoee River to near Ducktown), which reduced the scope of the proposed project to spot improvements along key sections of US 64. An Environmental Impact Statement (EIS) is currently being developed. Construction has been completed on the eastern section of the North Carolina portion of the route; additional study is underway by the North Carolina Department of Transportation in Cherokee and Graham Counties.

2.0 STUDY GUIDANCE

The 3rd Infantry Division Highway Corridor Study consists of two phases.

Phase I is detailed in this Conceptual Feasibility Report, which examines potential corridors to connect the urban areas of Savannah, Augusta, and Knoxville. Planning-level cost estimates were developed for the conceptual corridors for multiple design levels. Implementation steps which would be required to advance a corridor through future project development stages are also presented at a conceptual level.

An optional Phase II involves specific sub-studies to support a future long-range planning study and any subsequent National Environmental Policy Act (NEPA) studies. Sub-studies are optional; the need for and extent of Phase II elements will be determined later, based on the findings of Phase I.

Seven major work elements were undertaken in Phase I; outcomes of these tasks are discussed throughout the remainder of this Conceptual Feasibility Report.

1. Initially, the team collected an inventory of existing data sources for the four-State study area: Georgia, Tennessee, North Carolina, and South Carolina. The inventory included readily available geospatial datasets; statewide and MPO transportation plans; aerial photography; previous transportation studies within the region; and other online resources available through Federal, State, and local government agencies or non-profit organizations.
2. Within the General Study Area, control points were identified as corridor "wickets" through which all potential corridors must pass.
3. Corridors were developed between these control points to identify a general path that potential alternatives could follow. Study corridors were developed by a team of design professionals to follow existing roadways where possible, to avoid major resources, and to minimize major waterway crossings.
4. Design levels were developed, each of which could be applied to any of the corridors identified in the previous task. Design levels describe the intended function of the proposed route, for example, an Interstate, an arterial, etc.
5. Corridors were screened against "fatal flaws" to identify significant obstacles to implementation which effectively make a corridor infeasible or unreasonable for further study.
6. For corridors which passed the fatal flaw screening, cost estimates and implementation steps necessary to advance the corridor(s) through the project development process were identified.
7. Measures to collect and incorporate feedback from stakeholders and the public were implemented. Because of the large scale and conceptual nature of the study, the primary venues for public involvement were online resources: a project Web site and a public Webinar. The project Web site is available online through FHWA at *www.fhwa.dot.gov/planning/section_1927/.*

Following the completion of Phase I tasks, the consultant team will submit recommendations to FHWA for optional sub-studies under Phase II. Sub-studies are intended to explore specific impacts that a potential corridor could have on a number of topics, including travel time throughout the Southeastern United States, highway safety, the human and natural environment, social groups, quality of life for regional residents, economic development, long-term highway maintenance and operational elements, security, and more.

There is currently no funding identified beyond Phase II to support long range planning, environmental review, or any additional project development steps. These activities would have to be initiated at the State or regional level.

There is currently no funding identified for any additional project development stages beyond the optional Phase II studies.

2.1 Expert Working Group

An Expert Working Group (EWG) is a group with a particular knowledge about a topic or geographic area, formed to examine a particular situation or problem, and to provide unstructured suggestions about the topic. The EWG was assembled to provide direction and technical expertise on various aspects of the 3rd Infantry Division Highway Phase I study efforts. The EWG was a panel of area transportation officials, Federal resource agencies, and an organized opposition group that met throughout the study to guide the project. The EWG served as a sounding board to weigh technical options, examine issues from multiple perspectives and, by drawing upon its collective experience, help the team solve problems. The specific organizations represented on the EWG are identified below and were invited to participate in periodic status meetings at study milestones.

EWG members represent the following agencies:

- FHWA, Georgia Division
- FHWA, North Carolina Division
- FHWA, Tennessee Division
- FHWA, South Carolina Division
- FHWA, Eastern Federal Lands Highway Division
- FHWA Resource Center, Atlanta
- U.S. Forest Service, Southern Region
- U.S. Environmental Protection Agency, Region 4
- National Park Service, Southeast Region
- U.S. Fish and Wildlife Service, Southeast Region
- U.S. Army Corps of Engineers, South Atlantic Division
- Georgia Department of Transportation
- North Carolina Department of Transportation
- Tennessee Department of Transportation
- Appalachian Regional Commission
- Coastal Region Metropolitan Planning Organization (Savannah, GA)
- Augusta-Richmond County Planning Commission
- Knoxville Regional Transportation Planning Organization

- Cleveland Metropolitan Planning Organization
- Chattanooga-Hamilton County Regional Planning Agency
- Georgia Rural Development Council
- 3rd Infantry Command Group Fort Stewart, Hunter Army Airfield
- WaysSouth, formerly the "Stop I-3 Coalition"

In Phase I, the purpose of the EWG was to consider the information provided by the consultant team in the context of other State/regional plans and goals to ensure that the study thoroughly considers the potential impacts of the identified corridors. If Phase II sub-studies are conducted, the EWG membership may be adjusted based on the initial findings and the direction provided.

The EWG met four times during the course of the Phase I study. Meetings were held at the FHWA Georgia Division office in Atlanta, with an online meeting option for remote participation. Input received from EWG members is incorporated throughout this report.

The first EWG meeting was held September 16, 2010. The purpose of the meeting was to introduce the project team and members of the EWG; to discuss the role of the EWG and establish expectations; to provide an overview of the project history, scope of work, and schedule; and to discuss the preliminary project study area boundary, control points, public involvement plan, and data collection exercises.

The second EWG meeting was held on December 14, 2010. The purpose of the meeting was to review the updated study area and control points; to discuss the status of the public involvement and data collection tasks; and to discuss illustrative corridors.

The third EWG meeting was held on March 8, 2011. The purpose of the meeting was to review the four study corridors that were presented in the *Draft Alternatives Technical Memo*; to discuss the environmental constraints, fatal flaw screening, and design levels; and to present the consultant team's preliminary recommendations for corridor(s) to carry forward into the next task of preparing costs and project development steps. The need for public involvement and best format to collect input was also discussed in depth during the meeting.

The fourth EWG meeting was held on April 28, 2011. The purpose of the meeting was to present information about cost estimates and project development steps that would be required if transportation decisionmakers determined that a project should advance for further study or implementation. Public involvement measures were also discussed.

3.0 CORRIDOR ANALYSIS AND DESIGN TASKS

The project team followed a standard development process to move through the individual tasks within the study. Project team members relied on project development/technical judgment and recommendations from EWG members to define extents of the study area and geographic boundaries for individual control points. The team identified conceptual corridors between Savannah and Knoxville and screened them against fatal flaws to eliminate unreasonable and infeasible options. Corridors passing the screening advanced for additional Phase I study. The following subsections describe the iterative process employed to complete these tasks.

3.1 Study Area

The project team worked with the EWG to develop a study area, to describe the geographic region containing the study corridors that would be large enough to facilitate an examination of traffic flows, and to identify an area of influence for focused public outreach.

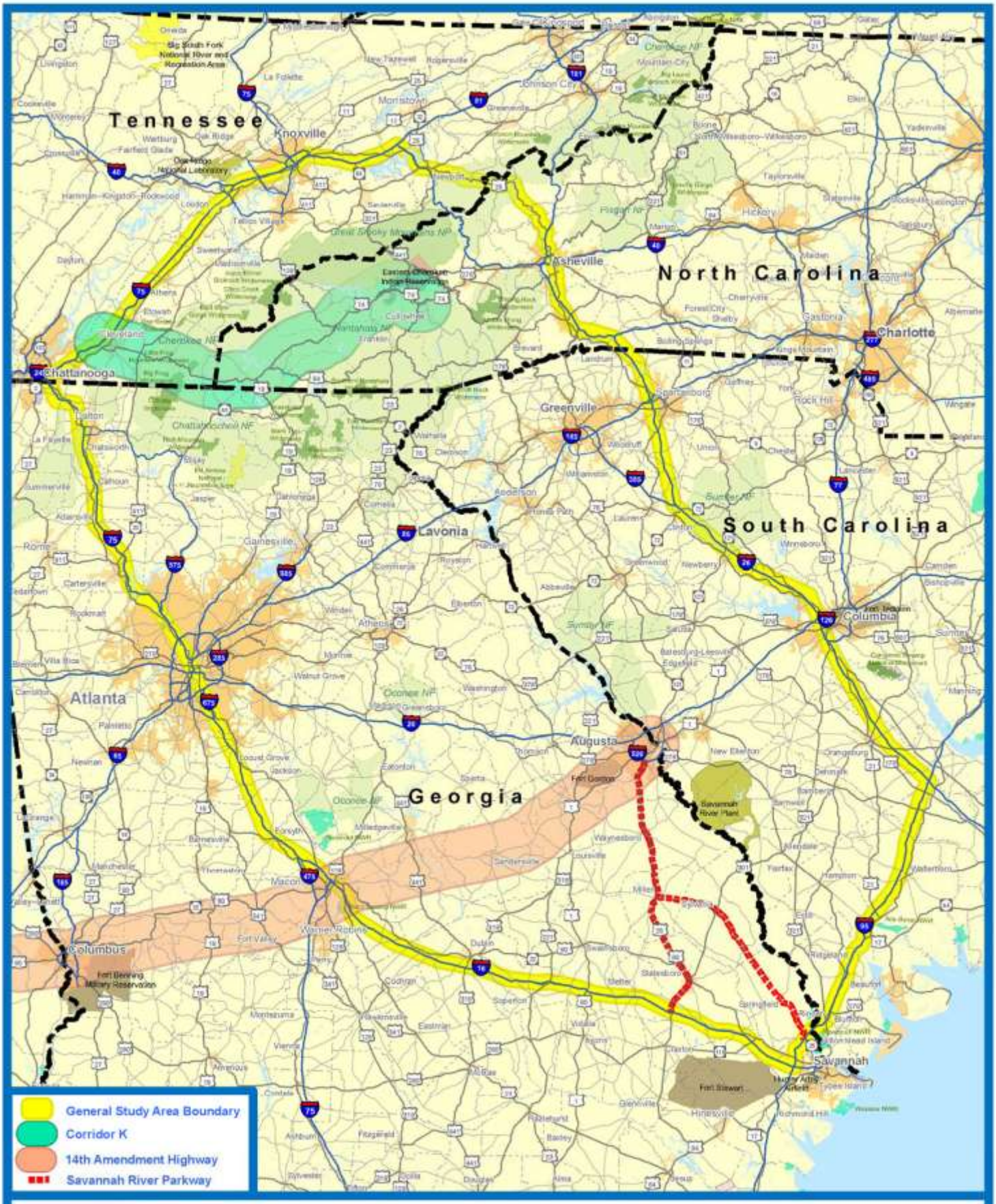
The study area was defined to follow existing Interstate routes along the boundary of a General Study Area (shown in **Figure 1**). On the east, the General Study Area runs northeast on I-95 from Savannah to I-26; northwest on I-26 through Columbia and Asheville to I-40; then west on US 25 to I-40 into Knoxville. On the west, the General Study area runs northwest on I-16 from Savannah to I-75 in Macon to Atlanta and north on I-75 to Knoxville. Following the eastern boundary of the General Study Area, 420 miles of existing Interstate connect Savannah and Knoxville. Following the western boundary of the General Study Area, 460 miles of existing Interstate connect Savannah and Knoxville.

Major cities within the General Study Area include: Savannah, GA; Augusta, GA; Atlanta, GA; Columbia, SC; Greenville, SC; Asheville, NC; Chattanooga, TN; and Knoxville, TN. The I-20 and I-85 pass through the General Study Area, traveling from Atlanta east and north to Columbia and Greenville, respectively. The Savannah River Parkway forms a recently constructed four lane highway link between Savannah and Augusta in the southern portion of the study area.

3.2 Control Points

Within the General Study Area, the control points serve as "wickets" through which potential corridors must pass. The alignments of the corridors can vary significantly between control points, but all corridors must pass through each.

Control Points represent "wickets" through which corridors must pass. Control Points were defined in Savannah, Augusta, Knoxville, and I-85 at Lavonia.



THIRD INFANTRY DIVISION HIGHWAY CORRIDOR STUDY

Figure 1
General Study Area Map

The SAFETEA-LU specified that the 3rd Infantry Division Highway corridor should link Savannah, Augusta, and Knoxville. Control points are to be near these cities, plus may include other points, if warranted. They are defined as the end of a section of highway improvement, near the cities cited in the statute, that shows independent utility (for example, a location where there is a substantial change in traffic volumes).

While the legislation requires that potential corridors connect the three cities identified, the Task Order for this study included a fourth control point at Lavonia, Georgia. The intent of this control point was to facilitate the development of corridors between the cities noted in the legislation while allowing consideration of corridors which would avoid the Great Smoky Mountains (GRSM) National Park.

The development of control points was based on various considerations: stakeholder preferences, the location of economic development activities and major traffic generators, the location of military bases, logical points in accordance with logical termini definition, and others. The location of the four control points is presented in the following subsections; additional information about the development of these points is provided in the *Control Points Technical Memo*.

a. Savannah, Georgia

Included in the original legislation, the Savannah Control Point addresses access to the third largest and fastest growing seaport on the eastern seaboard (Port of Savannah) and other resources in the Savannah area, such as tourist attractions, manufacturing sites, and military installations. The Savannah Control Point was defined as a connection along I-516 between the US 80/17 interchange and the SR 25 Connector (West Bay Street) interchange to better serve the key economic resources of Fort Stewart and the Port of Savannah.

b. Augusta, Georgia

The control point at Augusta is also included in the statutory language establishing the corridor concept. Augusta lies between Columbia, SC and Atlanta, GA along I-20. The I-520 is a ring road around Augusta and provides a bypass of the city center. Fort Gordon lies just west of the city and is a major contributor to the regional economy. The proposed Augusta Control Point was defined as crossing I-520 around Augusta or I-20 from the western edge of Augusta to a point just to the west of Fort Gordon.

Augusta is also the eastern terminus for the 14th Amendment Corridor (southern option) which is being studied concurrent with the 3rd Infantry Division Highway corridor. The 14th Amendment Corridor heads west from Augusta toward Macon, GA.

c. Lavonia, Georgia

The Lavonia Control Point is identified in the FHWA Task Order for the study. Lavonia itself is not an economic driver in the region; rather, it represents a break point from which potential corridors could be developed while considering the GRSM National Park. In other words, this control point would facilitate consideration of potential corridors that would avoid the park or use existing routes to traverse it, where possible. The Lavonia Control Point was defined as following I-85 from west of the Greenville Bypass to the US 441 interchange.

d. Knoxville, Tennessee

Knoxville, TN is the northernmost control point identified in the originating legislation. Knoxville can be accessed from the west (via I-75), from the south (via I-140), or from the east (via I-40). Therefore, the Knoxville Control Point is identified as a connection to an existing limited access highway at Knoxville.

Figure 2 identifies each of the four control points within the General Study Area, along with other key transportation facilities in the area such as Interstates, Corridor K, and the 14th Amendment Corridor.

3.3 Illustrative Corridors

At the second meeting of the EWG in December 2010, the project team presented a set of illustrative corridors to facilitate discussion among EWG members on the range of study alignment corridors. The EWG members also identified potential issues for consideration in the corridor evaluation process.

The EWG members offered a number of comments regarding sensitive resources that should be considered during the corridor development process. Corridors should avoid protected environmental resources: National Forest lands, federally designated Wilderness Areas, National Parks, National Wildlife Refuges, and critical endangered species habitats. Geologic concerns such as pyritic rock and mountain ranges, major river crossings, and the Savannah River Site nuclear reservation should be avoided. The EWG suggested that a special cross-section should be developed for segments in sensitive areas, similar to the I-70 tunnel sections near Denver or the elevated viaducts along the Blue Ridge Parkway. Also, all potential corridors should be developed before any are eliminated, for example, a link that provides access to Atlanta.

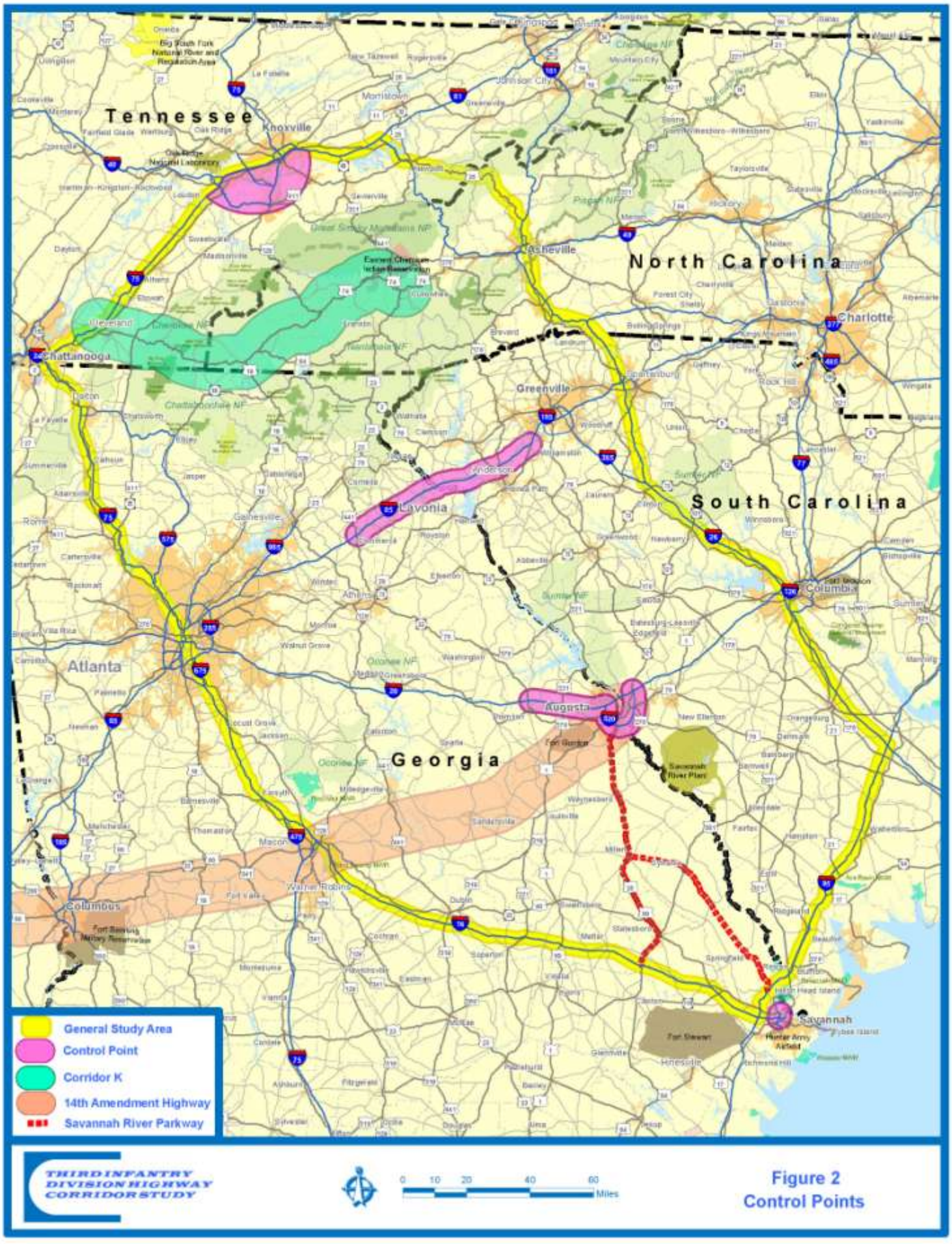


Figure 2
Control Points

3.4 Range of Study Corridors Considered

Based on the known constraints and input from the EWG, five study corridors were developed by a team of design professionals to follow existing roadways where possible, to avoid major resources (e.g., National Wildlife Refuges, National Forests, and State and National Parks) and major waterways to the extent possible, and to incorporate EWG input while connecting the metropolitan areas identified in the statutory language. These corridors are shown in **Figure 3**.

Corridors were developed for a high level comparison between conceptual alternatives and do not represent a recommended alignment.

Following is a brief description of the five study corridors:

Corridor A West	Farthest west option, running along I-16 west out of Savannah, passing west of Augusta, passing east of Athens and Gainesville, and following the western boundary of the National Forests to I-75 at Cleveland
Corridor A East	Follows Corridor A in the south, running along I-16 west out of Savannah, passing west of Augusta, passing east of Athens and Gainesville, then crosses through the National Forests north of Dahlonega to I-75 near Sweetwater
Corridor B	Follows the Savannah River Parkway from Savannah, running west of the Georgia/South Carolina State line, and following existing roadways through the National Forests and along the western boundary of the Great Smoky Mountains National Park to Knoxville; also includes a bypass option for SR 21 north of Savannah
Corridor C	Follows the Savannah River Parkway from Savannah, following new and existing alignments through South Carolina from Augusta to west of Greenville, and crosses through the National Forests and the Great Smoky Mountains National Park on existing alignments
Corridor D	Follows existing alignments from Savannah to Columbia, following I-26 and US 25 north and west to Knoxville

It should be noted that corridors describe approximate, conceptual locations, shown with an initial width of 1 mile. This reduced level of detail was used to facilitate a planning-level comparison between potential alternatives and development of preliminary planning-level cost estimates; these concepts do not represent an actual alignment nor is there a recommendation to advance these corridors unless policy-makers determine that additional project development activities should be undertaken.

THIRD INFANTRY DIVISION HIGHWAY CORRIDOR STUDY

Figure 3
Initial Study Corridors

In addition to the five primary corridors, a series of small connectors was also identified to form potential links between corridors. These connectors allow transitions from one corridor to another; for example, Segment AB forms a link between the southern portion of Corridor A and the northern portion of Corridor B.

For comparison, the distance between downtown Savannah (I-16/I-516 interchange) to downtown Knoxville (I-40/I-275 interchange) is 420 miles along the eastern boundary of the study area, following I-95 to I-26 to US 25 to I-40. Along the western boundary, the route is 460 miles long, following I-16 to I-75. The distance between these points is 435 miles along Corridor A, 365 miles along Corridor B, 370 miles along Corridor C, or 385 miles along Corridor D. All distances in this report are measured along the centerline of the corridor and do not account for horizontal/vertical curves that would occur along an actual roadway alignment.

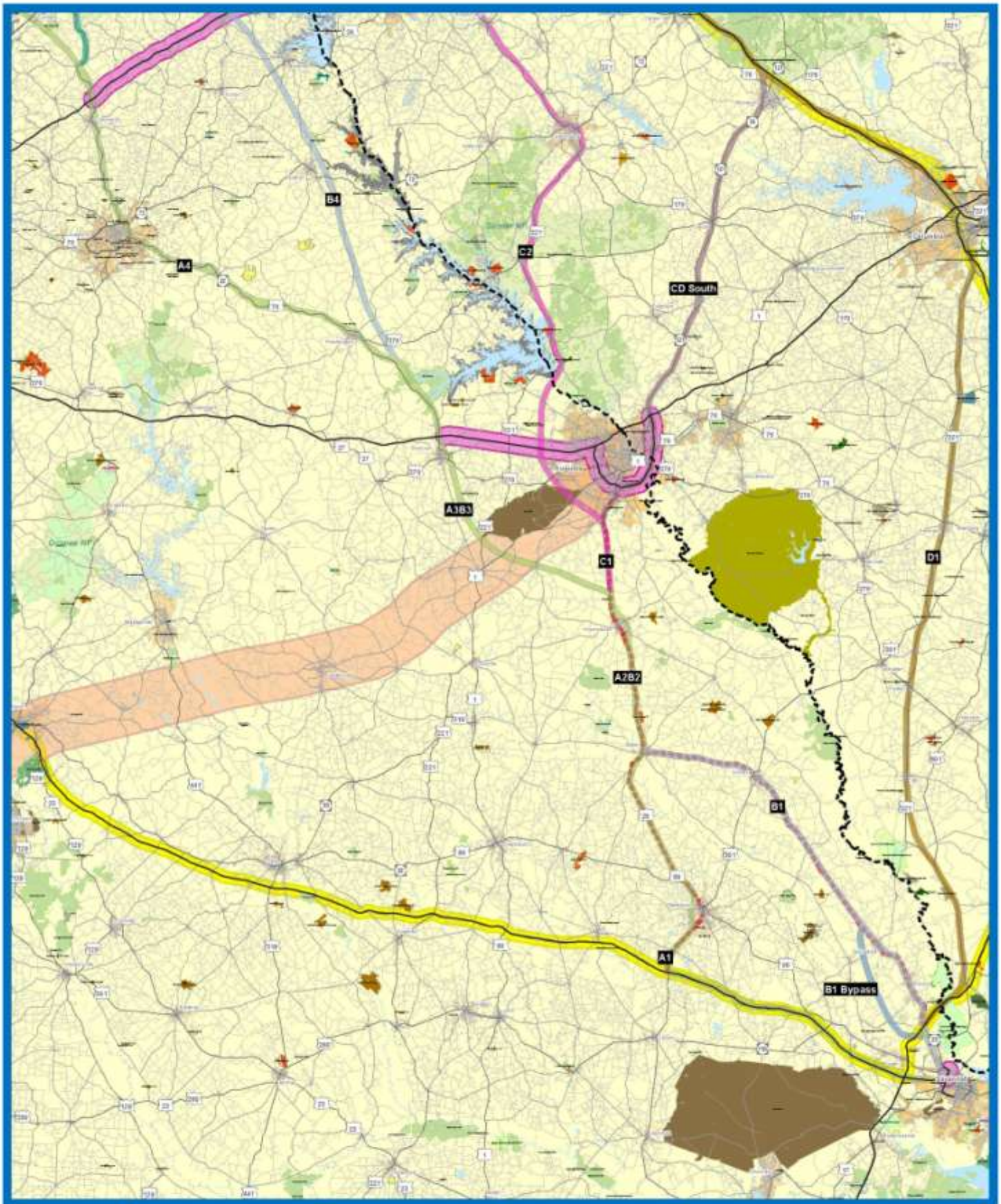
A corridor to/through Atlanta was not included in the list of options to be considered, since Interstate and arterial links within the metropolitan area already experience congestion and substantial delays. The Atlanta Regional Commission's 2007 *Regional Transportation Plan* identified the majority of regional roadways in DeKalb, Cobb, Gwinnett, and northern Fulton Counties as congested based on travel times during peak periods. Previous proposals to create a new bypass north and east of Atlanta met with substantial local opposition and were dismissed from further development. In addition, the Task Order for the study identifies a control point at Lavonia, east of Atlanta, as an intermediate destination along the proposed corridor. For these reasons, corridors within the Atlanta metropolitan area were not explored.

3.5 Sensitive Resources

Readily available data from a variety of online sources was assembled to provide an overview of major environmental attributes within the study area.

a. Protected Lands

Geospatial data from State and Federal databases was assembled to identify large tracts of protected lands: National Forests, National Parks and Recreational Areas, state parks, federally designated Wilderness Areas, water bodies, military installations, nature preserves, and more. These areas are shown in **Figures 4** and **5**. Protected Federal lands are concentrated in the northern portion of the General Study Area, north of the Lavonia Control Point.



THIRD INFANTRY DIVISION HIGHWAY CORRIDOR STUDY

Figure 4
Protected Lands South

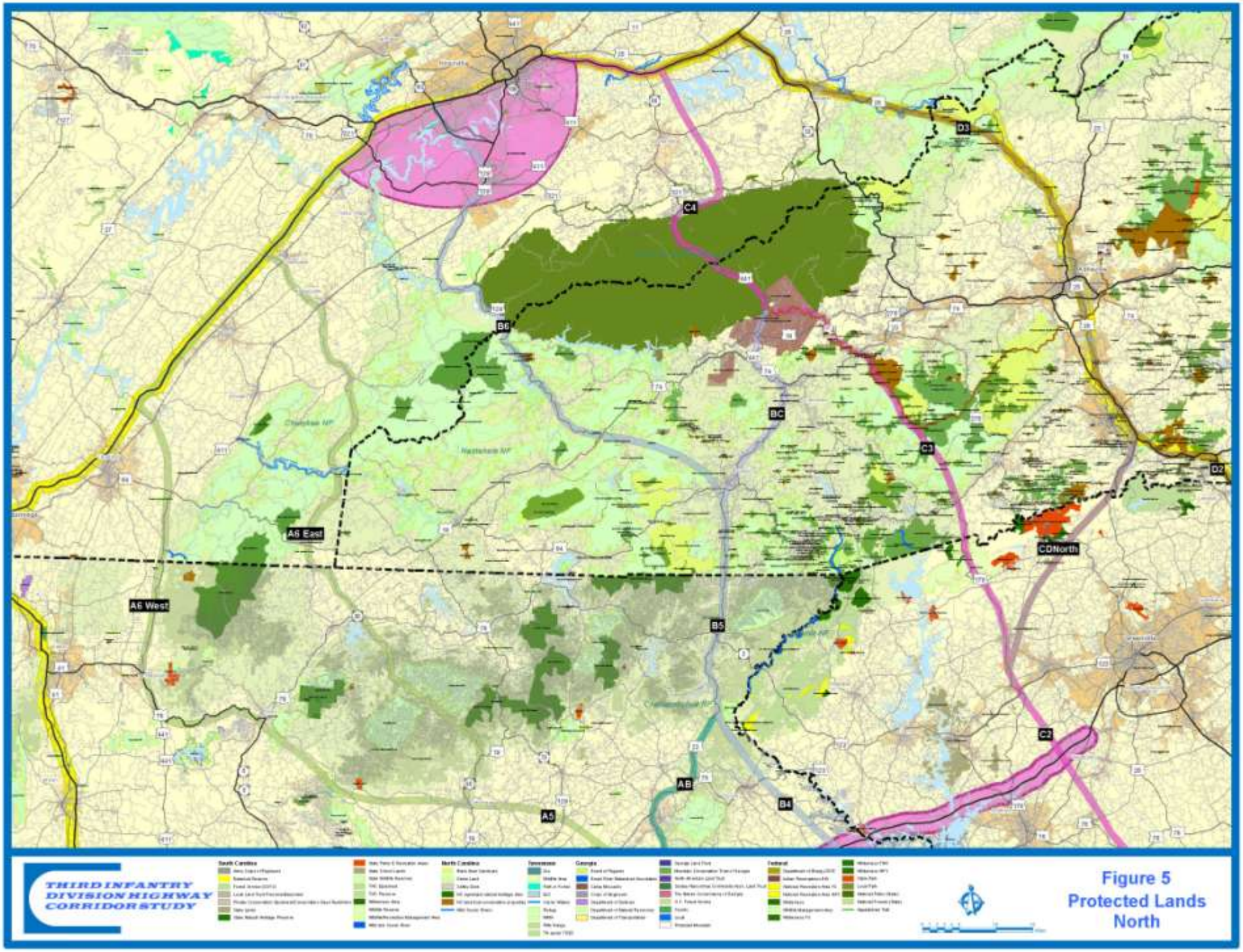


Figure 5
Protected Lands
North

Although these areas do not represent all of the constraints to highway development in the study area, they do represent the largest protected features. At the scale shown, each corridor is 1 mile wide. Smaller features – individual buildings, wetlands, cemeteries, etc. – are not visible at this scale and can generally be avoided by shifting an alignment within the wider corridor. Therefore, a large number of these types of smaller features are not presented for this level of analysis.

Federally designated Wilderness Areas are "lands designated for preservation and protection in their natural condition … which generally appear to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable."[1] These areas are stringently protected for recreational, scenic, scientific, educational, conservation, and historic uses and can only be removed from the National Wilderness Preservation System by a congressional designation. Use of motorized equipment or mechanical transport is prohibited within these areas. Numerous Wilderness areas exist within the General Study Area:

- Bald River Gorge Wilderness, 3,700 acres located approximately 20 miles southwest of the GRSM National Park
- Big Frog Wilderness, 8,100 acres located on the Georgia/Tennessee State line approximately 10 miles west of North Carolina
- Blood Mountain Wilderness, 7,800 acres located approximately 10 miles north of Dahlonega, GA
- Brasstown Wilderness, 12,900 acres located in north Georgia, south of Chatuge Lake
- Citico Creek Wilderness, 16,200 acres located approximately 10 miles southwest of the GRSM National Park
- Cohutta Wilderness, 37,000 acres located on the Georgia/Tennessee State line approximately 10 miles west of North Carolina
- Ellicott Rock Wilderness, 8,300 acres located on the Georgia/North Carolina/South Carolina State lines
- Gee Creek Wilderness, 2,500 acres located approximately 5 miles south of Etowah, TN
- Joyce Kilmer-Slickrock Wilderness, 17,400 acres on the North Carolina/Tennessee State line, approximately 5 miles southwest of the GRSM National Park
- Little Frog Mountain Wilderness, 4,700 acres located approximately 10 miles northwest of the Georgia/North Carolina/Tennessee State lines

[1] 1964 *Wilderness Act*, Section 2

- Mark Trail Wilderness, 16,400 acres located approximately 20 miles northwest of Dahlonega, GA
- Middle Prong Wilderness, 7,500 acres located approximately 10 miles south of Waynesville, NC
- Raven Cliffs Wilderness, 9,100 acres located approximately 15 miles northwest of Dahlonega, GA
- Rich Mountain Wilderness, 9,500 acres located approximately 10 miles northeast of Ellijay, GA
- Shining Rock Wilderness, 18,500 acres located approximately 10 miles southwest of Waynesville, NC
- Southern Nantahala Wilderness, 23,500 acres located on the North Carolina/Georgia state line east of Chatuge Lake
- Tray Mountain Wilderness, 9,700 acres located in north Georgia, approximately 10 miles southeast of Chatuge Lake

Two National Parks fall within the General Study Area. A large number of State and local parks also exist within the area. Public recreation lands – including public parks, historic sites, recreational areas, and wildlife/waterfowl reserves – are stringently protected from transportation uses by Section 4(f) of the 1966 Department of Transportation Act (Public Law 89-670). The law mandates that Section 4(f) properties may be converted to a transportation use only if there is no prudent and feasible alternative and the project includes all possible planning to minimize harm to the resource.

- The GRSM National Park covers over 800 square miles, divided between North Carolina and Tennessee. It is noted for its rich history, natural areas, and biodiversity. The GRSM is home to numerous federally threatened/endangered species and unique habitats; it has been designated as an International Biosphere Reserve and a World Heritage Site because of its unique natural resources. An estimated 8 to 10 million visitors come to the park each year, making it the most visited National Park in the country. According to 36 CFR 5.6, commercial traffic is prohibited within areas under the jurisdiction of the National Park Service, including the GRSM.
- The Blue Ridge Parkway was constructed between 1935 and 1987; it stretches over 450 miles through Virginia and North Carolina. The park is touted as "America's Favorite Drive" for its scenic vistas of mountain views, waterfalls, upland meadows, forests, and pastures.

National Forest lands cover around 5,000 square miles of the General Study Area. A limited number of Interstates, highways and local roads pass through the forest

lands, but some areas have been designated as roadless conservation areas based on a 2001 FEIS.[2] The following National Forests exist within the General Study Area.

- Chattahoochee National Forest, located in northern Georgia
- Cherokee National Forest, located in eastern Tennessee
- Nantahala National Forest, located in western North Carolina
- Oconee National Forest, located between Athens and Macon in Georgia
- Pisgah National Forest, located in western North Carolina, north of the GRSM National Park
- Sumter National Forest, located throughout portions of eastern South Carolina

National Wildlife Refuges (NWR) are managed lands set aside for conservation of fish, wildlife, and plants, managed by the U.S. Fish and Wildlife Service. In addition to federally designated NWRs, States and local communities have established conservation areas serving similar purposes, overseen by a range of government agencies and private organizations. These lands are also protected under Section 4(f) laws. Federal NWRs in the General Study Area include the following sites:

- Savannah NWR, located north of Savannah, GA in portions of South Carolina and Georgia, covers 28,200 acres of bottomland hardwood forest and tidal freshwater marsh.
- Bond Swamp NWR, north of Macon, GA, covers 6,500 acres of hardwood forest, swamp, creek, and lake areas.
- Piedmont NWR, north of Macon, GA, covers 35,000 acres of upland forest ridges and creeks.

As shown in **Figures 4** and **5**, a number of protected lands exist within or adjacent to Corridors A, B, C, and D, particularly north of the Lavonia Control Point. **Table 1** summarizes the number of parks, National Forests, and nature preserves that lie within or adjacent to the mile-wide corridors.

[2] Forest Service Roadless Area Conservation, Final Environmental Impact Statement. US Department of Agriculture, Forest Service. November 2000. Available on the USFS Web site *www.fs.usda.gov/*

Table 1 – Corridor Proximity to Protected Lands

Corridor	Parks Impacts	Distance in National Forests	Wilderness & Wildlife Zones
Savannah to Augusta			
A	Adjacent to 1 SP	None	None
B	Adjacent to 1 SP	None	None
C	Adjacent to 1 SP	None	None
D	None	None	3 miles in NWR
Augusta to Lavonia			
A	Adjacent to 1 SP and 1 Recreational Area	None	3.5 miles in WMA
B	None	None	3.5 miles in WMA
C	Adjacent to 1 SP	18 miles	Adjacent to 1 WMA
D	None	None	Adjacent to NHA
Lavonia to Knoxville			
A West	None	1.5 miles	2 WMA within corridor and 2 WMA adjacent
A East	None	53 miles	2 WMA within corridor
B	3 parks adjacent, including GRSM	79 miles	Gamelands and 1 NHA within corridor; 6 NHA adjacent
C	20 miles through GRSM	29 miles	Black bear sanctuary and 7 NHA within corridor, plus 7 NHA adjacent
D	Adjacent to 1 SP	41 miles	Black bear sanctuary and 3 NHA within corridor, plus 2 NHA adjacent

Key to abbreviations:

NHA = NC Natural Heritage Program natural heritage area;
WMA = wildlife management area
SP = State Park
GRSM = Great Smoky Mountains National Park

Table 2 lists major water features and other key resources within or adjacent to the four corridors. The density of large natural resources north of the Lavonia Control Point is higher than the density of resources in areas further south.

Table 2 – Waterways and Other Features

Corridor	Features
Savannah to Augusta	
A	No major features identified
B	No major features identified
C	Fort Gordon
D	Does not intersect Augusta Control Point
Augusta to Lavonia	
A	Clarks Hill Lake
B	Clarks Hill Lake
C	Clarks Hill Lake
D	Does not intersect Lavonia Control Point
Lavonia to Knoxville	
A West	Lake Zwerner dam, Carters Lake, Hiwassee River, Tennessee River
A East	Hiwassee River, Blue Ridge Lake, Tennessee River, Appalachian Trail
B	Little Tennessee River, Tallulah Falls Lake, Appalachian Trail, Fort Foudon Lake, Tellico Lake, Chilhowee Lake, Calderwood Lake, Santeetlah Lake, Cheoah River
C	Eastern Band of Cherokee Indians Reservation, Douglass Lake, French Broad River, Appalachian Trail
D	Appalachian Trail, French Broad River, Douglass Lake

b. Terrain and Geology

Aggressive mountainous terrain, particularly in the northern portion of the General Study Area, is another major constraint to development. Corridors B and C face the highest elevations with peaks up to 5,020 and 6,170 feet above sea level, respectively. Corridor A West faces the fewest terrain challenges with a maximum elevation of 2,510 feet.

Portions of Corridors A (East and West Options) and B pass through areas in northern Georgia that are designated as Protected Mountains by the GA Department of Natural Resources.

According to data from the U.S. Geological Survey, karst fissures exist in both the southeastern and northwestern portions of the General Study Area. Karst features form when a landscape underlain by soluble bedrock (such as limestone or dolomite) erodes below the ground surface, forming underground cavities, sinkholes, ridges, caves, or similar features. These features form a direct link to groundwater supplies; erosion or spills from construction projects are more likely to infiltrate groundwater flows in karst areas and are less likely to be neutralized through natural processes. This poses a risk to water quality, aquatic species,

wildlife, and human drinking water supplies. Special design measures to minimize and channel runoff are required for construction projects in karst areas.

Karst features are common in the northeastern and southeastern portions of the study area. Areas south and east of Jeffersonville, GA; Millen, GA; Barnwell, SC; and Orangeburg, SC are likely to contain features less than 1,000 feet in length. Bands of karst features greater than 1,000 feet in length run northeast-to-southwest on either side of I-75 from Calhoun, GA; Chattanooga, TN; Cleveland, TN; and Knoxville, TN to Newport, TN along I-40. Pockets of large karst features also exist throughout north Georgia near Jasper, around Ellijay, from Blue Ridge to Murphy to Bryson City, in Gainesville, and near Toccoa.

Landslides are also a concern in the study area. The majority of the area north of Atlanta and Columbia is moderately to highly susceptible to landslides. The highest incidence areas are along the North Carolina/Tennessee border as far east as Asheville, and dipping down into Georgia almost to Atlanta.

Acid-bearing rock is another geological issue which may be found within the northern portion of the General Study Area. Pyrite is a crystalline mineral found in some areas of the Appalachian Mountains. Exposing the mineral to moisture and oxygen can lead to the formation of Acid Rock Drainage (ARD). The ARD occurs naturally as part of the rock weathering process and represents a threat to the sustainability of rivers, streams and other freshwater systems; however, it can be exacerbated by highway construction activities. The potential for soil erosion and subsequent ARD due to disturbance is greatest in areas with rugged topography that require extensive cut/fill sections during construction. There are numerous options for addressing ARD. The most common practices include containment and neutralization at the point of disturbance or offsite. The impacts of acid-bearing rock have been seen on a variety of projects, including the North Shore Road highway project within the GRSM. Construction of the highway was suspended in the 1970s in part due to the environmental damage caused by the acidic rock encountered.

Table 3 presents a summary of likely geotechnical concerns for each corridor, divided into sections by control point.

Table 3 – Geotechnical Concerns by Corridor

Corridor	Terrain	GA Protected Mountains	Karst Potential	Landslide Potential
Savannah to Augusta				
A	Level	No	Yes	Moderate/High
B	Level	No	Yes	Moderate/High
C	Level	No	Yes	Moderate/High
D	Level	No	Yes	Moderate/High
Augusta to Lavonia				
A	Level	No	No	Moderate/High
B	Level	No	No	Moderate/High
C	Level	No	No	Moderate/High
D	Level	No	No	Moderate/High
Lavonia to Knoxville				
A West	Moderate	Yes	Yes	High
A East	Moderate	Yes	Yes	Moderate/High
B	Mountainous	Yes	Yes	High
C	Heavy Mountainous	No	Yes	High
D	Mountainous	No	Yes	Moderate/High

c. Population Demographics

Environmental justice regulations and Executive Orders protect minority and low-income populations from experiencing disproportionate adverse impacts on Federal projects. This distribution of minority and low-income community groups will have to be considered in-depth during future project development stages if any corridors are selected for implementation. Much of the study area population is considered low-income based on Federal poverty standards; the highest concentrations are south of I-20. The majority of rural counties are identified as economically distressed according to the U.S. Bureau of Economic Analysis and the U.S. Bureau of Labor Statistics. In the southern portion of the study area, a number of counties demonstrate above average minority population concentrations; concentrations are lower (less than 10%) for most counties in the study area north of I-85.

The Eastern Band of Cherokee Indians, located in western North Carolina, represent a sovereign nation and major economic generator/tourist attraction within the study area. Extensive coordination will be required if any corridors near this area are selected for additional project development activities.

3.6 Corridor Screening against Fatal Flaws

Initially four corridors were developed between Savannah and Lavonia and five corridors were developed between Lavonia and Knoxville, with an EWG recommendation that no more than one corridor should pass through the GRSM National Park. These corridors were screened against "fatal flaws" to identify significant obstacles to implementation that effectively make a corridor infeasible or unreasonable for further study. The density of natural resources, the vast area protected by State or Federal designations, and aggressive terrain features throughout the northern portion of the study area create numerous challenges to highway development. A number of regional residents and organizations have been outspoken about their desire to protect natural and cultural resources by limiting development. Stakeholder input is discussed further in **Section 7**.

Corridors were screened against fatal flaws to identify significant obstacles that make corridors infeasible or unreasonable for further study. Impacts within a National Park, extreme mountainous terrain, or avoiding control points represent fatal flaws.

A variety of perspectives suggest that a western corridor provides the "least objectionable option" for the northern portion of the General Study Area (between Lavonia and Knoxville). The term "least objectionable" was recommended by the EWG as the best descriptor for the corridor selected to advance for cost estimating.

a. Impacts within a National Park represent a fatal flaw

From a planning-level environmental constraints perspective, Corridor A West impacts the fewest protected lands. This corridor avoids the GRSM National Park, unlike Corridors B or C. Because of the park's wilderness areas, rich biodiversity, and protected status, transportation improvements within the park are strictly limited. According to 36 CFR 5.6, commercial traffic is prohibited within the park. A 2010 *Environmental Assessment* (EA) documents that a proposal to add turn lanes to a popular picnic area along Newfound Gap Road was rejected because of the extent of impacts on character-defining features along the roadway.[3] Work on the proposed North Shore Road was suspended decades ago due to environmental impacts; the 2007 EIS supported a monetary settlement

[3] *Environmental Assessment, Great Smoky Mountains National Park*. Project PRA-GRSM 1B19. U. S. Department of the Interior, National Park Service. July 2005. Available online at *http://www.efl.fhwa.dot.gov/files/projects/environment nfg_ea.pdf*

rather than completing the planned construction project because it would result in fewer impacts.[4]

Corridor C would also impact the Blue Ridge Parkway National Park; it follows the length of the existing alignment for 45 miles between SR 215 and US 441. No other alternatives would impact this park.

Impacts within the National Forests were considered alongside park impacts during the analysis of sensitive resources, described in **Section 3.5**. While impacts to National Forests represent a critical concern, they were not identified as a fatal flaw. Regulations governing forest management permit a number of uses that are exempt from stringent Section 4(f) protections, including guidelines for developing transportation facilities. Impacts should be avoided or minimized, but corridors were not eliminated solely for impacting National Forest lands. Corridor A West has the fewest impacts within the National Forests, with 1.5 miles passing through the Forest near the southwestern boundary by Chatsworth, GA. This compares to at least 40 miles through the National Forests for other corridors. Other corridors result in fewer impacts to State parks, State wilderness/wildlife zones, areas within Georgia designated as Protected Mountains, or waterways; however, Corridor A West provides the fewest National Forest impacts.

b. Extreme mountainous terrain represents a fatal flaw

From a constructability perspective, mountainous terrain in the northern portions of the General Study Area provides another reason to favor a western corridor between Lavonia and Knoxville. Extremely aggressive terrain challenges are a second fatal flaw considered because of the associated cost and constructability concerns. Corridor A West has the fewest terrain challenges in the northern section, followed by Corridor A East with the next fewest. Corridors B, C, and D pass through more aggressive terrain in the southern Appalachian Mountains. Corridor A also passes through fewer areas highly susceptible to landslides when compared to Corridors B, C, and D.

From an economic perspective, corridors that avoid mountainous terrain are again preferable. Mountainous terrain has a significant impact on cost, both for initial construction and continuing maintenance activities. Based on decades of experience and data from completed projects, TDOT estimates that projects constructed in heavily mountainous terrain cost 2 to 5 times more than roadways constructed in mountainous or rolling terrain, respectively. Corridors B, C, and D are likely to be even more costly because the alignments bisect the mountain

[4] Per NPS briefing statement online at *http://www.nps.gov/grsm/parkmgmt/upload/North-Shore-Rd-3-15-10.pdf*

ranges rather than following the ridge lines. In today's era of financial constraint, financial feasibility is a major concern that deserves consideration when developing transportation projects.

c. Avoiding Control Points represents a fatal flaw

The statutory language establishing the vision for the 3rd Infantry Division Highway corridor specifies that the corridor must connect Savannah, Augusta, and Knoxville. Any corridor that does not provide increased mobility and connectivity to all three of these urban centers is considered fatally flawed. Corridor D does not efficiently serve Fort Gordon or improve connectivity to the Augusta area. It also avoids the Lavonia Control Point, defined in the FHWA Task Order for the study.

From a regional transportation perspective, Corridor D provides minimal differences compared to the existing I-95 to I-26 corridor. Corridor D is 35 miles shorter than the existing I-95 to I-26 corridor between Savannah and Knoxville, an 8 percent savings compared to the existing route. However, it still travels through congested sections of existing Interstate in Columbia and Asheville.

Routes which bypass congested urban areas provide travel time savings by avoiding peak period delays. Reliability is a potential issue for routes through areas prone to landslides; I-40 in particular has been closed for several months in recent years to clean up slides.

Corridor A West provides a slightly shorter travel distance between Savannah and Knoxville (435 miles) than the existing I-16 to I-75 corridor (460 miles) and also bypasses major congestion and bottlenecks in the Atlanta area.

North of Augusta, Corridor B passes through largely undeveloped, rural areas. From a regional transportation viewpoint, it would not provide improved connectivity to any urban centers between Augusta and Knoxville.

Corridors A, B, and C each would provide opportunities to link to the proposed Corridor K and proposed 14th Amendment Highway, for an improved east-west mobility option.

3.7 Recommendations for Study

As summarized in **Table 4**, a variety of perspectives suggest that a western corridor provides the least objectionable option for the northern portion of the General Study Area (between Lavonia and Knoxville). Based on environmental constraints, constructability and engineering concerns, economic considerations, and regional transportation connections, Corridor A West from I-85 at Commerce, along the western boundary of the

National Forests, to I-75 at Cleveland was advanced for additional study to develop cost estimates. Other northern corridors should be eliminated because they would lead to greater impacts within the National Forests, would fall within the established boundaries of GRSM National Park, would face high costs and constructability issues from other terrain/geotechnical obstacles, and/or would not provide access to the four areas identified as control points. Construction through mountainous terrain is estimated to cost up to five times more than construction in flat or rolling terrain.

Table 4 – Summary of Fatal Flaw Screening (Lavonia to Knoxville)

Corridor	GRSM Impacts	Terrain	Control Points	Fatally Flawed
A	No	Moderate	Crosses 4	No
B	Possible	Aggressive	Crosses 4	Yes
C	Yes	Extremely Aggressive	Crosses 4	Yes
D	No	Aggressive	Crosses 2	Yes

For the southern portion of the General Study Area (between Savannah and Lavonia), Corridors A, B, or B Bypass along the Savannah River Parkway should also be advanced for additional study to develop cost estimates. Either corridor provides a comparable level of mobility and impacts which could provide a reasonable, feasible connection to a western corridor beyond Lavonia.

Additional technical analysis and public involvement activities would be required to support this screening if the corridor were advanced for additional project development activities, specifically as part of the Preliminary Engineering and Environmental Analysis phase described in **Section 6.4**.

4.0 DESIGN LEVELS

Per the FHWA Task Order and input from the EWG, three roadway design levels were considered along the proposed corridors: Interstate, Arterial, and Super-2. At this conceptual level of detail, any design level could be applied to any corridor segment. Design levels are described below and were applied to corridors passing the fatal flaw screening.

Interstate Design Level. The first design level complies with the typical design standards for an Interstate route. The actual cross-section can vary depending on the width, design speed, type of median, and the terrain. Interstate System design standards require that an Interstate has no at-grade intersections. For this planning level of analysis, it was assumed that connections would be made through grade-separated interchanges. Smaller cross streets would either be terminated on either side of the proposed alignment or passed over/under the proposed facility.

A variation of this design level is a special Interstate section specifically identified for areas of rugged terrain or in environmentally sensitive areas. The special Interstate design level incorporates tunnels or elevated roadway sections on viaduct to minimize impacts. This cross-section would reduce the roadway footprint by reducing the need for cut/fill sections. It also helps to address concerns with rock slides, which are inherent due to the region's geology.

Examples of this special Interstate design level are found on Interstates and parkways throughout the country: the 4,600-foot Cumberland Gap tunnel on US 25E near the Kentucky, Tennessee, and Virginia border; tunnels through the Allegheny Mountains along the Pennsylvania turnpike, I-70, and I-76; and I-70 through Glenwood Canyon in Colorado. Special Interstate sections may help eliminate the need for seasonal road closures through the GRSM or address existing landslide issues along I-40 and similar roadways. Special Interstate sections should be considered during future project development activities if any corridors warrant additional consideration as an Interstate-level route.

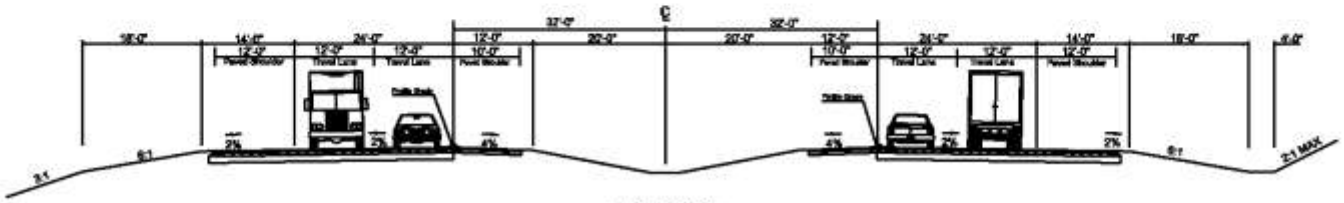
Figure 6A shows an example cross-section for a four-lane Interstate facility; **Figure 6B** shows an example cross-section for the special Interstate design level.

Arterial Design Level. The second design level is for a four-lane, divided highway with at-grade intersections. Grade-separated interchanges may be included at major arterial junctions with other arterial routes. Four lane arterials typically have 60 to 70 mph design speeds with 12-foot lanes and full width paved shoulders. The width of the median can vary, as shown in **Figure 7**.

Super-2 Design Level. The third design level is for a three-lane highway with at-grade intersections. Super-2 highways start with a standard two-lane cross sections and, as needed, a third lane is added for passing, truck climbing, turning, and other purposes. Research shows Super-2 highways are typically safer than two-lane highways and can be constructed at lower costs than traditional four-lane highways. **Figure 8** illustrates an example cross-section for a Super-2 highway, showing sections of both a two-lane and three-lane segment.

As part of the cost estimating task, a lowest cost scenario was also applied to reuse existing routes as much as possible. The Minimal Build option is intended to present the minimum level of improvement necessary to implement a continuous two-lane 3rd Infantry Division Highway route within a given corridor.

FIGURE 6A
INTERSTATE DESIGN LEVEL



TANGENT SECTION
4 LANES WITH A 64' MEDIAN
(D.S. 65 MPH)

FIGURE 6B
SPECIAL INTERSTATE DESIGN LEVEL

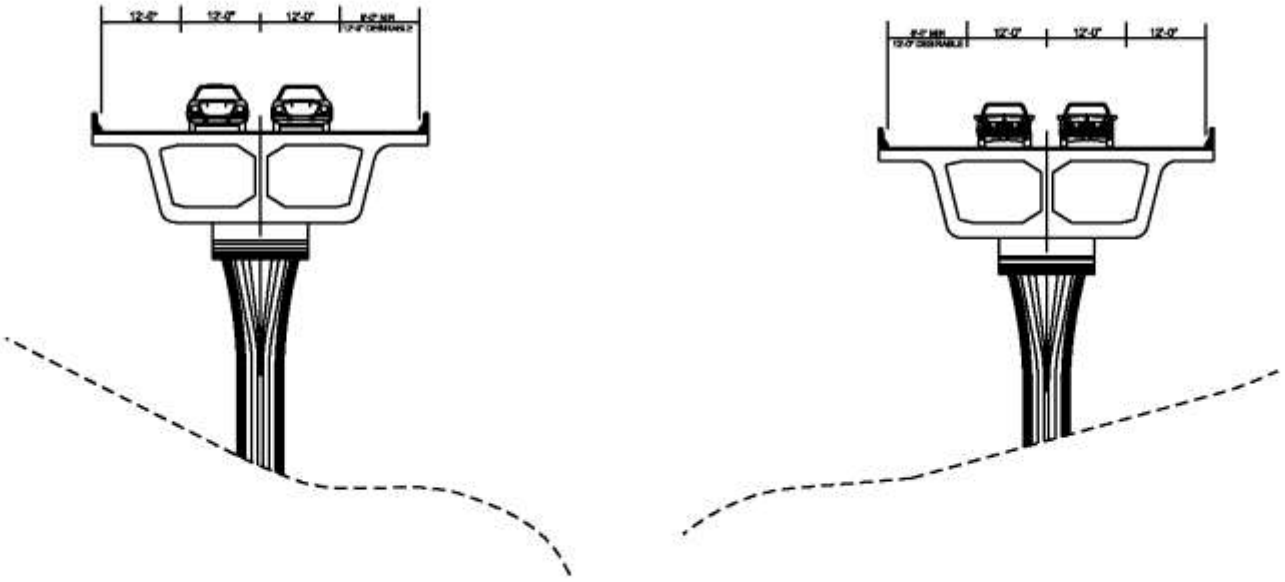
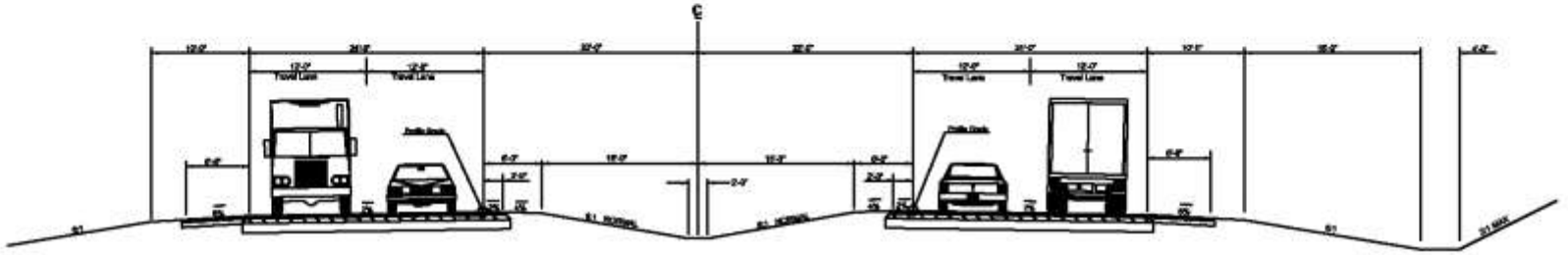
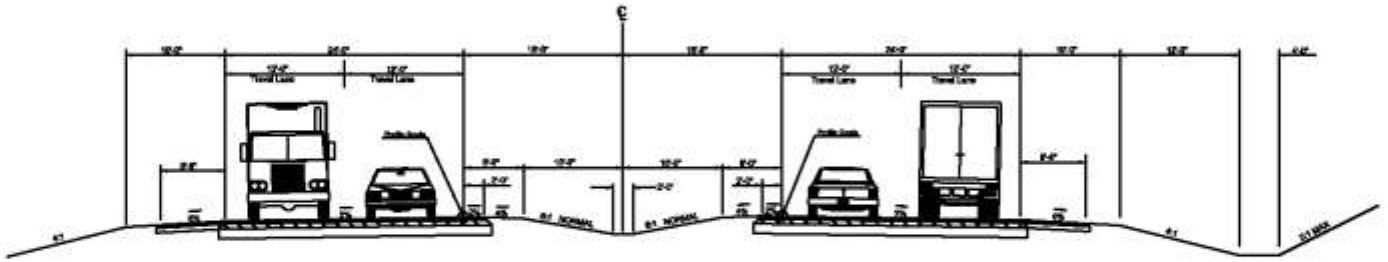


FIGURE 7
ARTERIAL DESIGN LEVEL

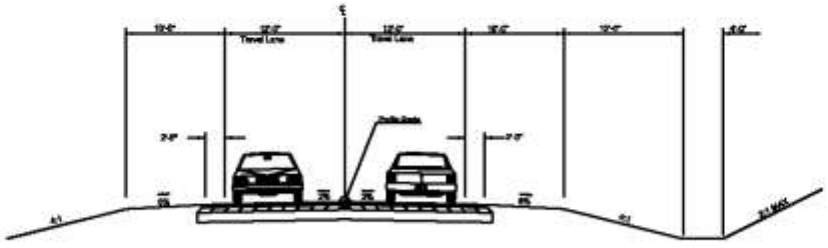


NORMAL CROWN
4 LANES WITH A 44' MEDIAN
(D.S. 65 MPH)

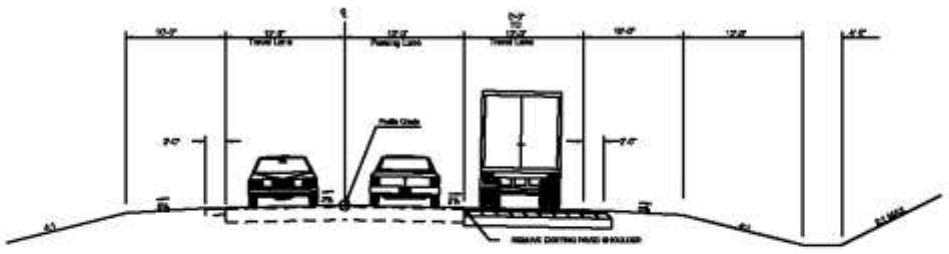


NORMAL CROWN
4 LANES WITH A 32' MEDIAN
(D.S. 55 MPH)

FIGURE 8
SUPER-2 HIGHWAY DESIGN LEVEL



TANGENT SECTION
2 LANES
(D.S. 55 MPH)



TANGENT SECTION
3 LANES
(D.S. 55 MPH)

5.0 COST ESTIMATES

Based on the results of the fatal flaw screening and the recommendations of the EWG, the alternative scenarios presented in **Table 5** were advanced. It was determined that the other corridors were unreasonable and therefore should be eliminated from further consideration. The next step in the analysis process involved preparing cost estimates and an outline for the steps anticipated to construct the corridor.

Table 5 – Alternative Scenarios Advanced for Cost Estimates

Corridor	Design Level
A West (entire length*)	Interstate Design Level
A West (entire length*)	Arterial Design Level, plus reusing existing Interstate segments
A West (entire length*)	Super-2 Design Level, plus reusing existing Interstate and Arterial segments
A West (entire length*)	Minimal Build Option – involves reusing existing roadway alignments available today, with minor spot improvements and two lane highways for new alignment sections
B/B Bypass (Savannah to Millen)	Interstate or Arterial Design Level
No Build	Installing signage along existing Interstate route (as suggested by the EWG)

** A West costs were developed for the entire corridor length (Savannah to Knoxville) and for the GA portion (Savannah to Chatsworth) with a spur at Dalton to I-75.*

To develop cost estimates, the consultant team employed planning-level cost estimating tools developed by GDOT and TDOT for sections of the corridor within respective States. The following subsections present an overview of the State costing methodologies and specific costs for the corridors.

5.1 GDOT Cost Estimating Methodology

The general procedure and tools developed by GDOT were used to estimate the planning-level cost of approximately 350 miles of the corridor within Georgia. Based on the GDOT estimating procedure, the total cost is the sum of four components: Right-of-Way, Utilities, Construction, and Preliminary Engineering.

For Right-of-Way elements, GDOT assigns unit costs per acre. Unit costs vary by county, project type (widening existing facilities or construction on new alignments), and by area type (commercial, residential, agricultural, or industrial). Costs are inflated to account for administration and contingencies. Unadjusted right-of-way unit costs range from $5,000 to $25,000 per acre for agricultural uses and from $100,000 to $1 million per acre for commercial uses.

For Utility elements, GDOT assigns unit costs per mile. Utility unit costs account for relocation of water lines, gas lines, and power poles for all non-Interstate projects, plus sewer lines for urban non-Interstate projects. Contingencies are factored into the utility cost estimate. Per-mile utility costs are estimated at $1.2 million for rural non-Interstate routes and $1.8 million for urban non-Interstate routes. No utility costs are associated with Interstate projects, unless an existing highway is being upgraded to Interstate standards.

Construction unit costs account for the project type (widening existing roadway/bridge or constructing new roadway/bridge on new alignments), area type (rural or urban), and facility type (Interstate, 2-lane highway, 3-lane highway, or 4-lane highway). The proposed roadway width and project length are multiplied by the unit cost; a contingency factor is applied based on the project type to account for unknown elements which have not been defined at the planning-level. **Table 6** presents unadjusted construction unit costs for different project types in urban and rural areas.

Table 6 – GDOT Unadjusted Construction Costs* by Project Type

Project Type	Rural	Urban
Widen existing Interstate	$85,000	$120,000
Widen existing non-Interstate	$83,000	$126,000
Construct new 2-lane highway	$130,000	$161,000
Construct new 4-lane highway/Interstate	$186,000	$245,000
Widen existing bridge	$770,000	
Construct new bridge	$640,000	

** Costs presented per foot of new width x mile of project length*

Preliminary Engineering includes design, environmental, and public involvement work that must be completed before construction begins. This element is estimated as 10 percent of the total project cost.

The sum of these four elements represents the total project cost. Costs are presented in 2010 dollars.

5.2 TDOT Cost Estimating Methodology

The TDOT cost estimating procedure was developed based on actual project costs collected over the past decades. Based on the TDOT estimating procedure, the total cost is the sum of three components: Right-of-Way, Construction, and Preliminary Engineering. Utility costs are included in the Construction element in the TDOT model.

The Right-of-Way unit cost is adjusted to account for the area type (rural, residential, industrial, commercial, central business district, etc.). Before this adjustment factor is applied, right-of-way is estimated to cost $93,000 per mile.

Construction unit costs are adjusted to account for terrain (flat, rolling, mountainous, or heavy mountainous) and project type (reconstruction/new construction and number of lanes). Per-mile construction costs range from $7.9 million to widen a two-lane highway to four lanes on rolling terrain to $28.3 million to construct a new four-lane Interstate through mountainous terrain.

Other construction costs are estimated per item. For example, grade-separated interchanges are assigned a cost between $10 million and $30 million each, depending on complexity and engineering judgment. Signalized intersections are assigned a cost between $75,000 and $100,000 each. Costs may also be added to account for sidewalks, welcome centers/rest areas, roundabouts, and major structures.

Preliminary Engineering includes design, environmental, and public involvement work that must be completed before construction begins. This element is estimated as 10 percent of the construction costs.

Typically, TDOT does not apply contingency costs this early in the project development process. However, for this study, a 10 percent contingency was applied to the total project cost. This will account for project elements identified in the scope which are not specifically covered in the TDOT model: environmental mitigation, erosion control, wetland management, landscaping, intelligent transportation systems, and other unknown costs. In addition, 10 percent was added to the construction cost to account for construction engineering and inspection services.

The sum of the Right-of-Way, Construction, and Preliminary Engineering elements, plus a 10 percent contingency, represent the total project costs. Costs for the TN portions were developed in 2009 dollars and have been projected to 2010 dollars using a 3.6 percent annual inflation rate.

5.3 Cost Estimates for Study Corridors

Using the methodologies developed by TDOT and GDOT, planning-level cost estimates were prepared for the entire length of Corridor A West for each of the four design levels, for Corridors B and B Bypass between Savannah and Millen at the Interstate and Arterial design levels, and for the No Build option. These are presented in the following subsections; all dollar values are rounded to the nearest million dollars.

Costs were developed to bring all portions of each segment up to the relevant design level. For example, if a four-lane arterial runs from Location X to Y, and a three-lane highway continues from Location Y to Z, the following method would be used:

- For the entire roadway segment between X and Z, no costs would be associated with the Minimal Build or Super-2 design levels since the existing route already

provides at least three travel lanes, meeting the minimum criteria for these design levels.

- For the roadway segment between Y and Z, costs to upgrade the three-lane section to a four-lane arterial would be presented for the Arterial design level; no costs would be associated with the existing four lane-section since it meets the minimum criteria.
- Costs for the Interstate design level would be presented to upgrade the entire segment (X to Z) from a three-lane or four-lane lane highway to an Interstate-level corridor with grade-separated interchanges.

a. Corridor A West Costs

Corridor A West was divided into 16 sections for costing purposes. Sections were divided at control points, urban areas, and where the corridor transitions between existing highways. Costs for these 16 sections are described below. **Figure 9** illustrates the location of each section within the corridor and associated costs for each design level.

Summing the costs for each of the sections, the total cost to construct the 435-mile Corridor A West is estimated at $700 million to $4.8 billion, as shown in **Table 7**.

Table 7 – Corridor A West Total Costs, by Phase and Design Level

	Min. Build	**Super-2**	**Arterial**	**Interstate**
Engineering	$65 million	$113 million	$237 million	$468 million
ROW	$68 million	$108 million	$313 million	$576 million
Utility*	$73 million	$176 million	$198 million	$252 million
Construction	$483 million	$790 million	$1.716 billion	$3.680 billion
TOTAL**	**$701 million**	**$1.216 billion**	**$2.501 billion**	**$4.845 billion**
GA Total	$564 million	$902 million	$2.099 billion	$4.316 billion
TN Total	$137 million	$314 million	$402 million	$529 million

** Utility costs presented for GA portion only; TN utility costs included in construction category*
*** Additional 10% contingency added to total project costs within TN*

I-16, Savannah to US 25 – 48 miles of existing four-lane Interstate

Planned Projects: No projects are included within Georgia's *Statewide Transportation Improvement Program* (STIP).

Assumptions: No improvements included for this section.

Cost Estimate: No improvements included since the existing alignment satisfies the criteria for each of the design levels.

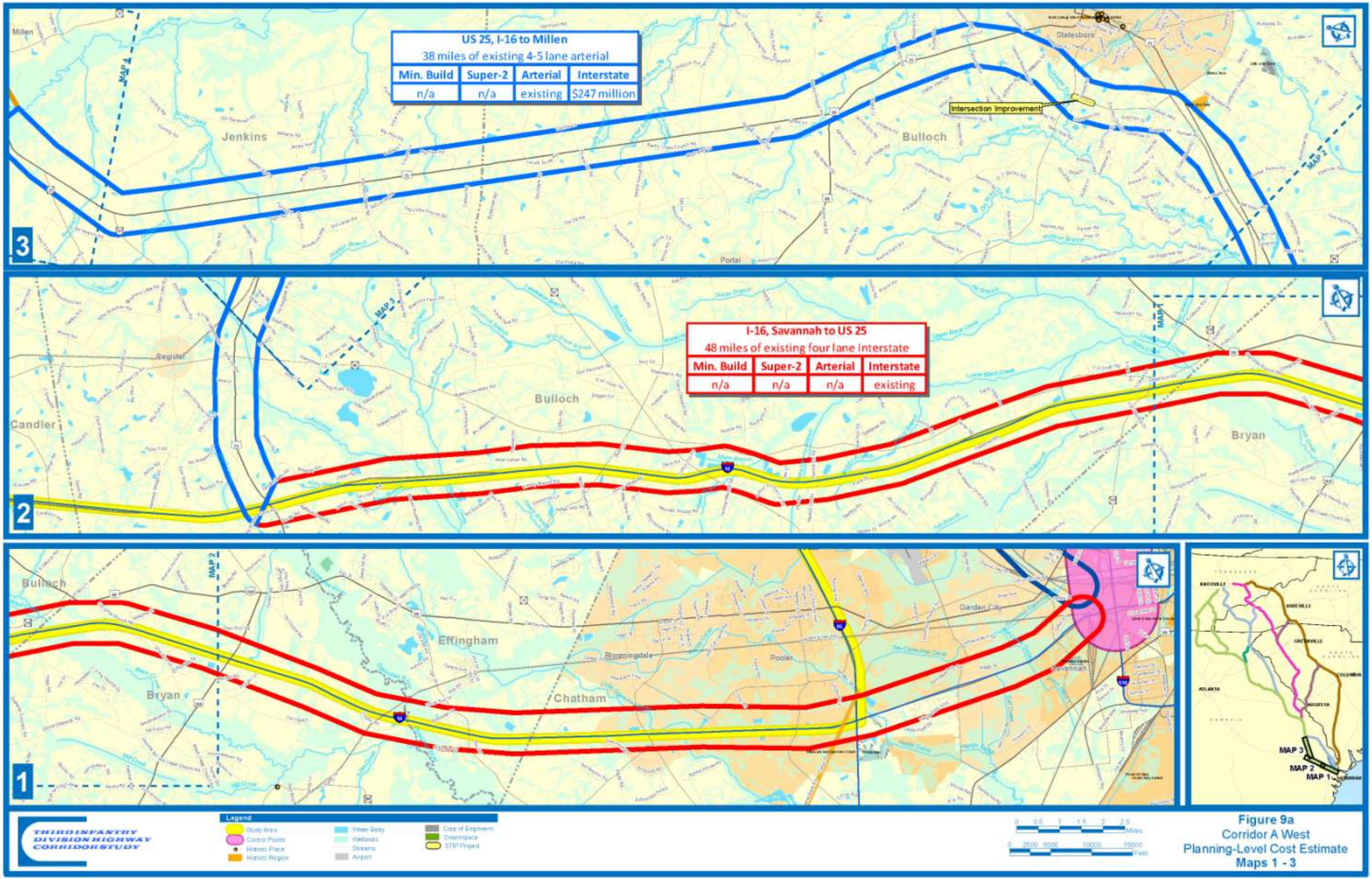
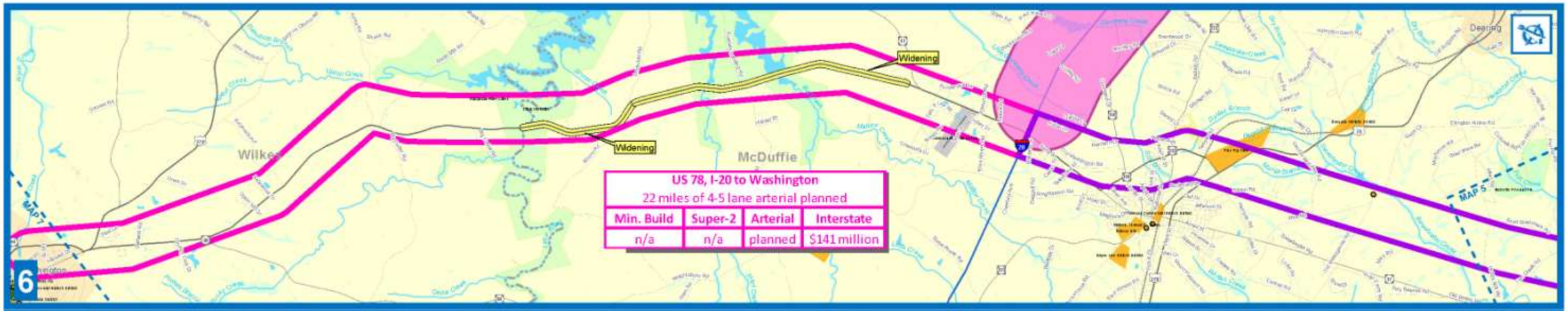


Figure 9a
Corridor A West
Planning-Level Cost Estimate
Maps 1 - 3



THIRD INFANTRY DIVISION HIGHWAY CORRIDOR STUDY

Legend
Study Area
Control Points
Historic Place
Historic Region
Airport
Water Body
Wetlands
Streams
Corp of Engineers
Greenspace
Wildlife Management Area
State Park
GA Department of Transportation
Natural Resources Conservation Service
STIP Project

0 0.5 1 1.5 2 2.5 Miles
0 2500 5000 10000 15000 Feet

Figure 9b
Corridor A West
Planning-Level Cost Estimate
Maps 4 - 6

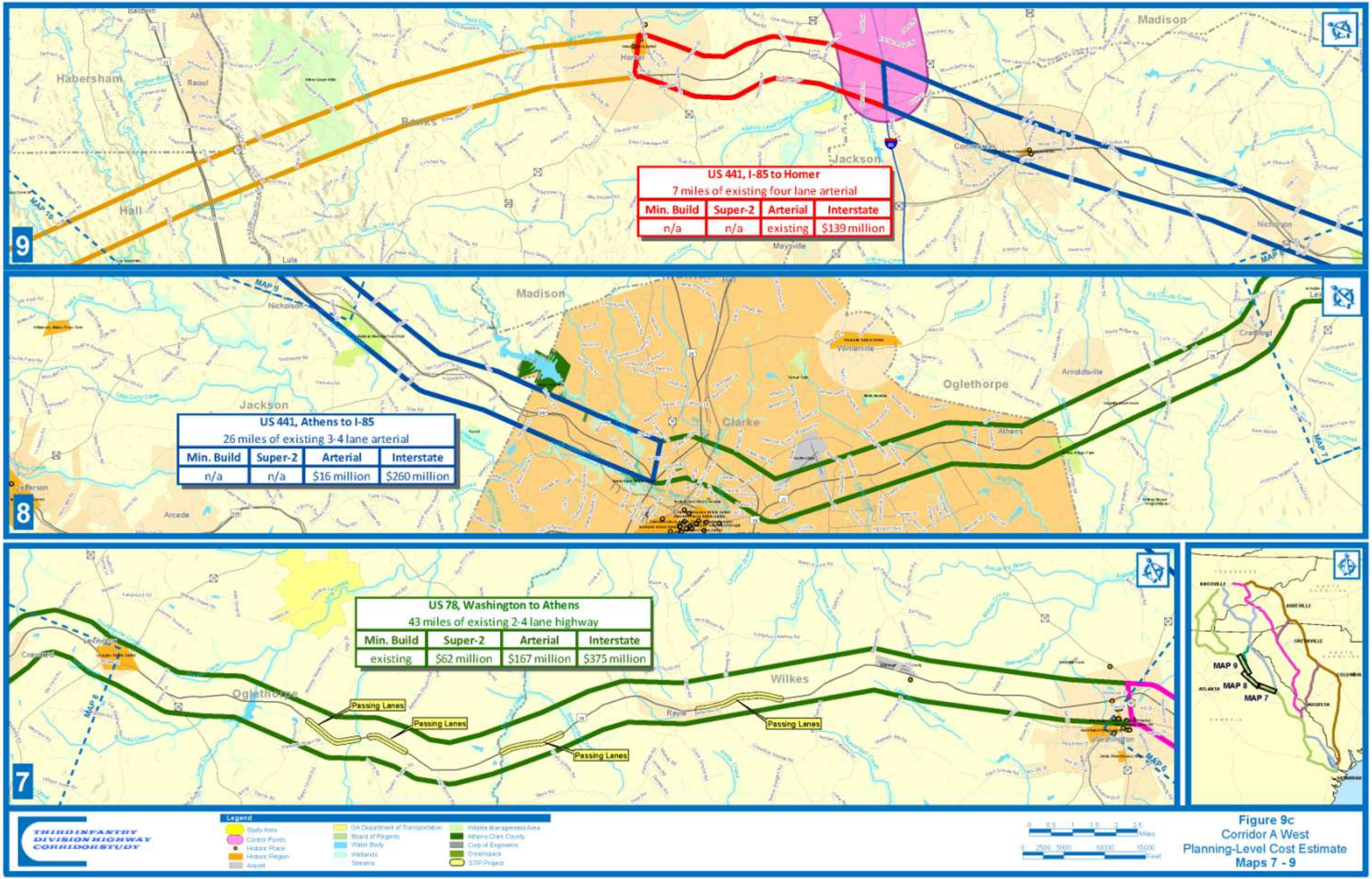


Figure 9c
Corridor A West
Planning-Level Cost Estimate
Maps 7 - 9

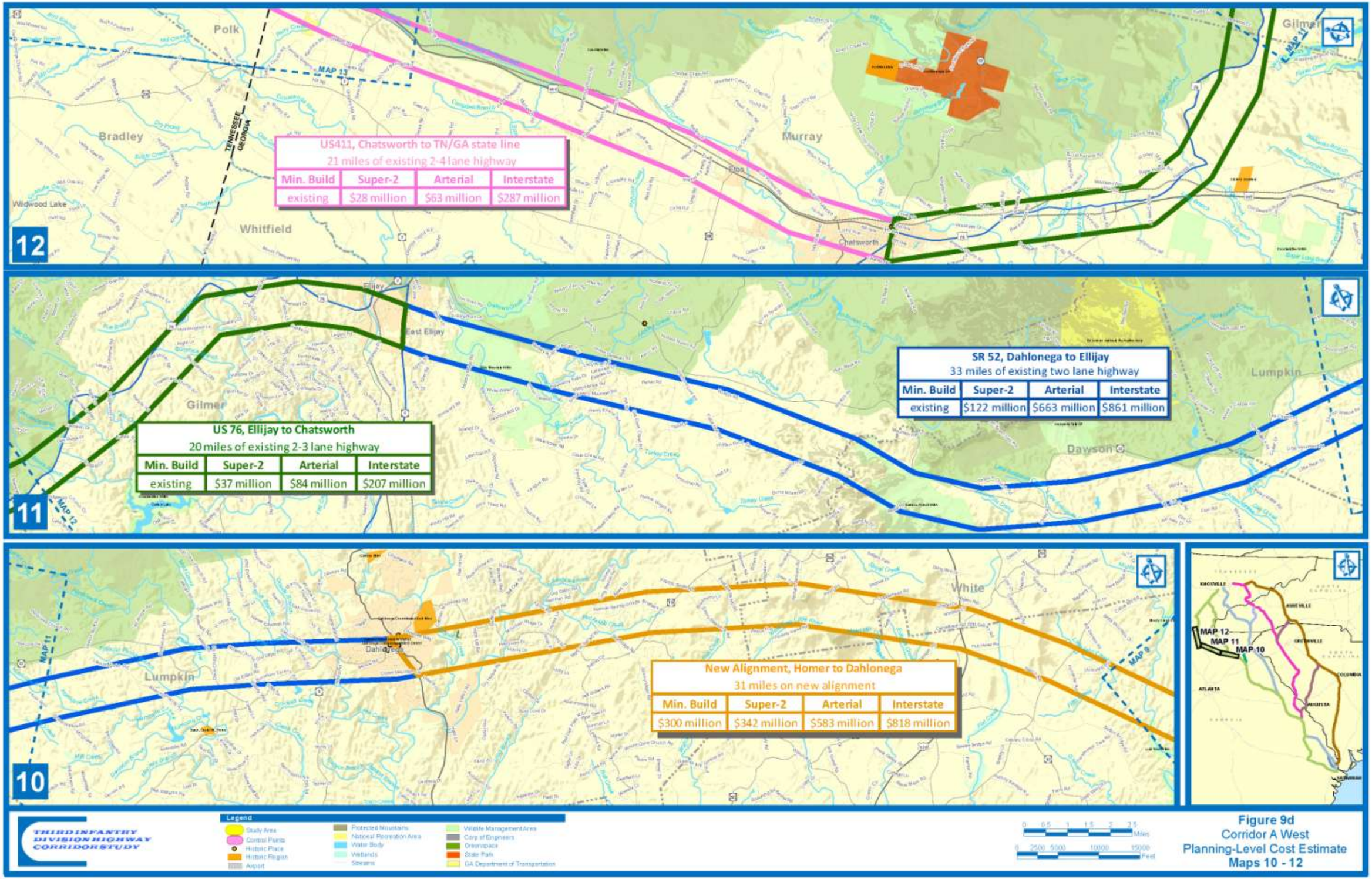


Figure 9d
Corridor A West
Planning-Level Cost Estimate
Maps 10 - 12

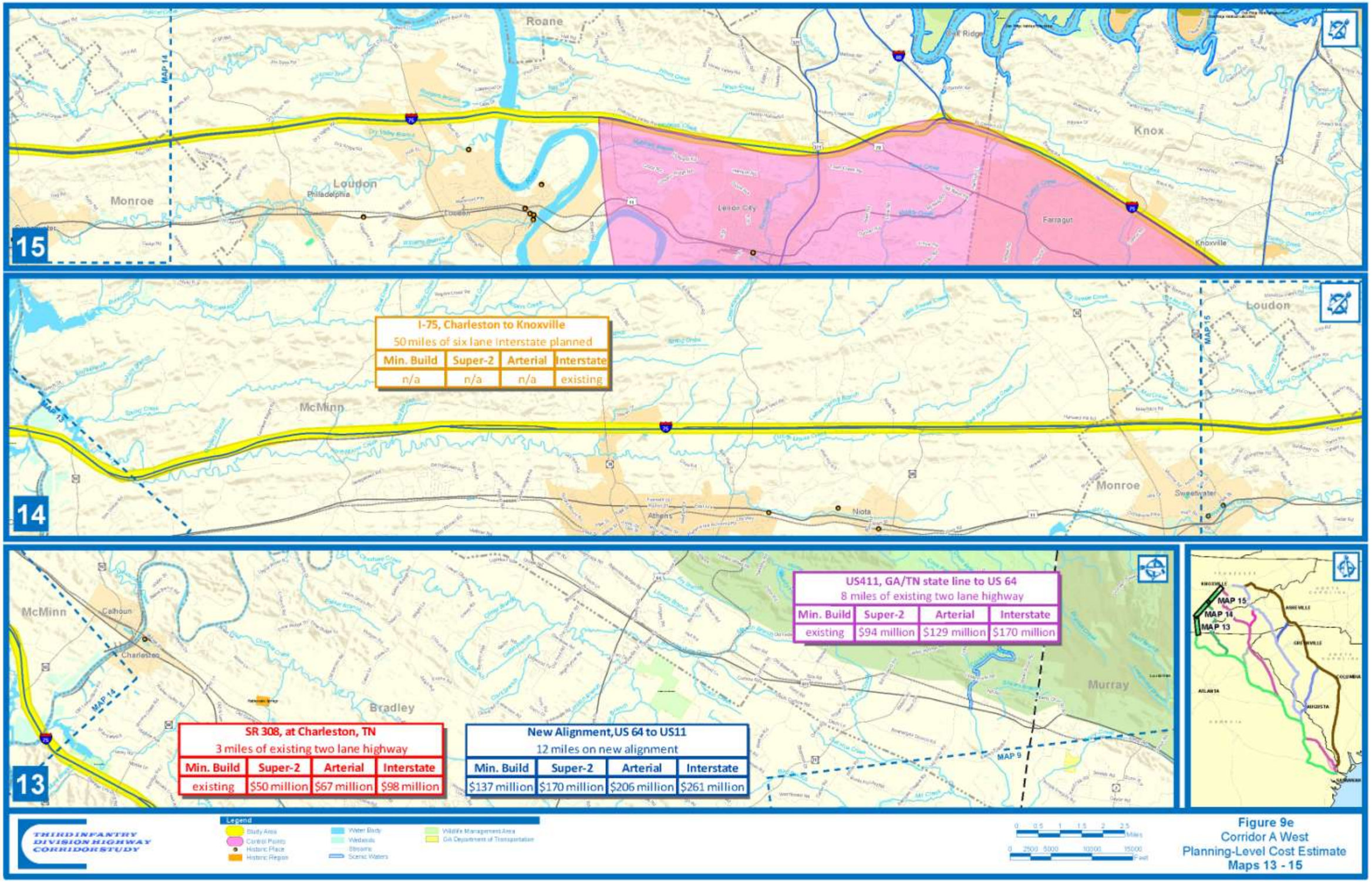


Figure 9e
Corridor A West
Planning-Level Cost Estimate
Maps 13 - 15

US 25, I-16 to Millen – 38 miles of existing four- to five-lane arterial

Planned Projects: No projects are included within Georgia's STIP.

Assumptions: Right-of-way is primarily rural, predominantly used for agricultural purposes with some commercial and industrial uses.

Cost Estimate:

Table 8A	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	n/a	n/a	existing	$25 million
ROW	n/a	n/a	existing	$22 million
Utility	n/a	n/a	existing	$44 million
Construction	n/a	n/a	existing	$156 million
Project Total	n/a	n/a	existing	$247 million

US 25, Millen to Waynesboro – 30 miles of existing four- to five-lane arterial

Planned Projects: No projects are included within Georgia's STIP.

Assumptions: Right-of-way is a mix of rural and urban areas, but predominantly used for agricultural purposes with some commercial and residential development.

Cost Estimate:

Table 8B	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	n/a	n/a	existing	$25 million
ROW	n/a	n/a	existing	$41 million
Utility	n/a	n/a	existing	$36 million
Construction	n/a	n/a	existing	$152 million
Project Total	n/a	n/a	existing	$254 million

New Alignment, Waynesboro to I-20 – 35 miles on new alignment

Planned Projects: No projects are included within Georgia's STIP.

Assumptions: Right-of-way is rural agricultural.

Cost Estimate:

Table 8C	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	$26 million	$31 million	$52 million	$73 million
ROW	$13 million	$16 million	$32 million	$42 million
Utility	$36 million	$41 million	$39 million	n/a
Construction	$189 million	$223 million	$400 million	$612 million
Project Total	$264 million	$311 million	$523 million	$727 million

US 78, I-20 to Washington – 22 miles of four- to five-lane arterial planned

Planned Projects: A project to widen US 78 from SR 43 to the Washington Bypass to four- to five lanes is scheduled in Georgia's 2010 STIP (projects 222250, 222255) with right-of-way funding in 2011 and construction funding after 2014.

Assumptions: Interstate costs presented are calculated based on improving the upgraded four- to five lane arterial identified in the STIP. Right-of-way is primarily rural, predominantly used for agricultural purposes with some commercial and residential development.

Cost Estimate:

Table 8D	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	n/a	n/a	planned	$14 million
ROW	n/a	n/a	planned	$19 million
Utility	n/a	n/a	planned	$27 million
Construction	n/a	n/a	planned	$81 million
Project Total	n/a	n/a	planned	$141 million

US 78, Washington to Athens – 43 miles of existing two- to four-lane highway

Planned Projects: Segments are identified for widening in the 2010 Georgia STIP. Passing lanes are included in the 2010 STIP for a 5-mile section of US 78 with right-of-way funding in 2011 and construction funding after 2014.

Assumptions: Right-of-way is primarily urban and contains a mixture of residential, commercial, and agricultural uses.

Cost Estimate:

Table 8E	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	existing	$8 million	$17 million	$37 million
ROW	existing	$5 million	$45 million	$80 million
Utility	existing	$33 million	$46 million	$51 million
Construction	existing	$16 million	$59 million	$207 million
Project Total	existing	$62 million	$167 million	$375 million

US 441, Athens to I-85 – 26 miles of existing three- to four-lane arterial

Planned Projects: A project to widen the three-lane segment of US 441 to the Clarke County line is included in the statewide long-range transportation plan. However, it is not considered a committed project since funding is not allocated in the current Georgia STIP.

Assumptions: Right-of-way is a mixture of rural and urban areas, divided between commercial and residential uses.

Cost Estimate:

Table 8F	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	n/a	n/a	$2 million	$26 million
ROW	n/a	n/a	$7 million	$38 million
Utility	n/a	n/a	$4 million	$33 million
Construction	n/a	n/a	$3 million	$163 million
Project Total	n/a	n/a	$16 million	$260 million

US 441, I-85 to Homer – 7 miles of existing four-lane arterial

Planned Projects: No projects are included in Georgia's STIP.

Assumptions: Right-of-way is primarily urban, predominantly used for residential development with some commercial uses.

Cost Estimate:

Table 8G	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	n/a	n/a	existing	$14 million
ROW	n/a	n/a	existing	$7 million
Utility	n/a	n/a	existing	$9 million
Construction	n/a	n/a	existing	$109 million
Project Total	n/a	n/a	existing	$139 million

New Alignment, Homer to Dahlonega – 31 miles on new alignment

Planned Projects: No projects are included in Georgia's STIP.

Assumptions: Right-of-way is primarily rural residential.

Cost Estimate:

Table 8H	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	$30 million	$34 million	$58 million	$82 million
ROW	$35 million	$42 million	$77 million	$98 million
Utility	$37 million	$37 million	$37 million	n/a
Construction	$198 million	$229 million	$411 million	$638 million
Project Total	$300 million	$342 million	$583 million	$818 million

SR 52, Dahlonega to Ellijay – 33 miles of existing two-lane highway

Planned Projects: No projects are included in Georgia's STIP.

Assumptions: The Super-2 design level includes costs to upgrade the existing SR 52 alignment; the Arterial and Interstate levels assume a new facility on new alignment outside the National Forest boundary. Right-of-way is primarily rural residential and passes through mountainous terrain.

Cost Estimate:

Table 8I	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	existing	$12 million	$66 million	$86 million
ROW	existing	$9 million	$82 million	$104 million
Utility	existing	$38 million	$39 million	n/a
Construction	existing	$62 million	$476 million	$671 million
Project Total	existing	$122 million	$663 million	$861 million

US 76, Ellijay to Chatsworth – 20 miles of existing two- to three-lane highway

Planned Projects: Minor realignments of US 76 are proposed at either end of this segment; however, these are not considered committed projects since funding is not allocated in the current STIP.

Assumptions: Right-of-way is primarily rural, predominantly used for residential developments with some commercial and agricultural uses.

Cost Estimate:

Table 8J	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	existing	$4 million	$8 million	$21 million
ROW	existing	$3 million	$22 million	$38 million
Utility	existing	$15 million	$22 million	$24 million
Construction	existing	$15 million	$32 million	$124 million
Project Total	existing	$37 million	$84 million	$207 million

US 411, Chatsworth to TN/GA state line – 21 miles of existing two- to four-lane highway

Planned Projects: Widening near the northern end of the segment is included in the statewide long-range transportation plan; however, it is not considered a committed project since funding is not allocated in the current Georgia STIP.

Assumptions: Right-of-way contains both urban and rural areas, with a mixture of residential, commercial, and industrial land uses.

Cost Estimate:

Table 8K	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	existing	$3 million	$6 million	$29 million
ROW	existing	$2 million	$13 million	$48 million
Utility	existing	$11 million	$11 million	$28 million
Construction	existing	$12 million	$33 million	$182 million
Project Total	existing	$28 million	$63 million	$287 million

US 411, TN/GA state line to US 64 – 8 miles of existing two-lane highway

Planned Projects: No projects are included in Tennessee's STIP.

Assumptions: Right-of-way lies in rolling terrain, containing a mix of residential and commercial land uses.

Cost Estimate:

Table 8L	**Min. Build**	**Super-2**	**Arterial**	**Interstate**
Engineering	existing	$6 million	$9 million	$11 million
ROW	existing	$8 million	$11 million	$14 million
Utility/Const.	existing	$71 million	$97 million	$129 million
Project Total[5]	existing	$94 million	$129 million	$170 million

New Alignment, US 64 to US 11 – 12 miles on new alignment

Planned Projects: No projects are included in Tennessee's STIP.

Assumptions: Right-of-way lies in rolling terrain, containing a mix of residential and commercial land uses.

Cost Estimate:

Table 8M	**CSD**	**Super-2**	**Arterial**	**Interstate**
Engineering	$9 million	$11 million	$14 million	$18 million
ROW	$20 million	$20 million	$20 million	$20 million
Utility/Const.	$96 million	$123 million	$153 million	$199 million
Project Total[5]	$137 million	$170 million	$206 million	$261 million

SR 308, at Charleston, TN – 3 miles of existing two-lane highway

Planned Projects: No projects are included in Tennessee's STIP.

Assumptions: Right-of-way lies in rolling terrain, containing a mix of residential and commercial land uses.

Cost Estimate:

Table 8N	**CSD**	**Super-2**	**Arterial**	**Interstate**
Engineering	existing	$4 million	$5 million	$7 million
ROW	existing	$3 million	$4 million	$5 million
Utility/Const.	existing	$39 million	$52 million	$77 million
Project Total[5]	existing	$50 million	$67 million	$98 million

I-75, Charleston to Knoxville – 50 miles of six-lane Interstate planned

Planned Projects: A feasibility study prepared by TDOT recommends widening I-75 from Georgia to Kentucky before 2030.

Assumptions: No improvements included for this section.

[5] Additional 10% contingency added to total project costs within Tennessee

Cost Estimate: No improvements included since the existing alignment satisfies the criteria for each of the design levels.

b. Corridor A West Dalton Spur Costs

Designers also considered creating a spur to I-75 at Dalton, eliminating the remainder of the corridor north of Chatsworth. Costs for this spur connection are shown below, divided by phase for the Interstate design level. The SR 52 provides an existing four-lane arterial connection from Chatsworth to I-75 through Dalton.

Table 9 – Dalton Spur Costs by Phase

	Interstate
Engineering	$16 million
ROW	$28 million
Utility	$17 million
Construction	$103 million
Project Total	$164 million

To implement Corridor A West improvements from Savannah to I-75 at Dalton is estimated to cost 13 percent to 27 percent less than the full corridor to Knoxville. **Table 10** presents the total costs for both options.

Table 10 – Corridor A West and Dalton Spur Costs

	Min. Build	**Super-2**	**Arterial**	**Interstate**
A West to Knoxville	$701 million	$1.2 billion	$2.5 billion	$4.8 billion
A West to Dalton	$564 million	$874 million	$2.0 billion	$4.2 billion

c. Corridor B and B Bypass Costs

Corridor B follows SR 21 (Savannah River Parkway) from Savannah to south of Millen where it joins with Corridor A. A bypass option west of the existing SR 21 alignment allows the corridor to avoid congestion from Savannah to Springfield. **Figure 10** illustrates the location of the corridor and associated costs for the arterial and Interstate design levels.

Planned Projects: A corridor study is underway by GDOT and the Chatham County-Savannah Metropolitan Planning Commission to determine the best ways to enhance mobility and livability along this key thoroughfare. It is not considered a committed project since funding is not allocated in the current Georgia STIP.

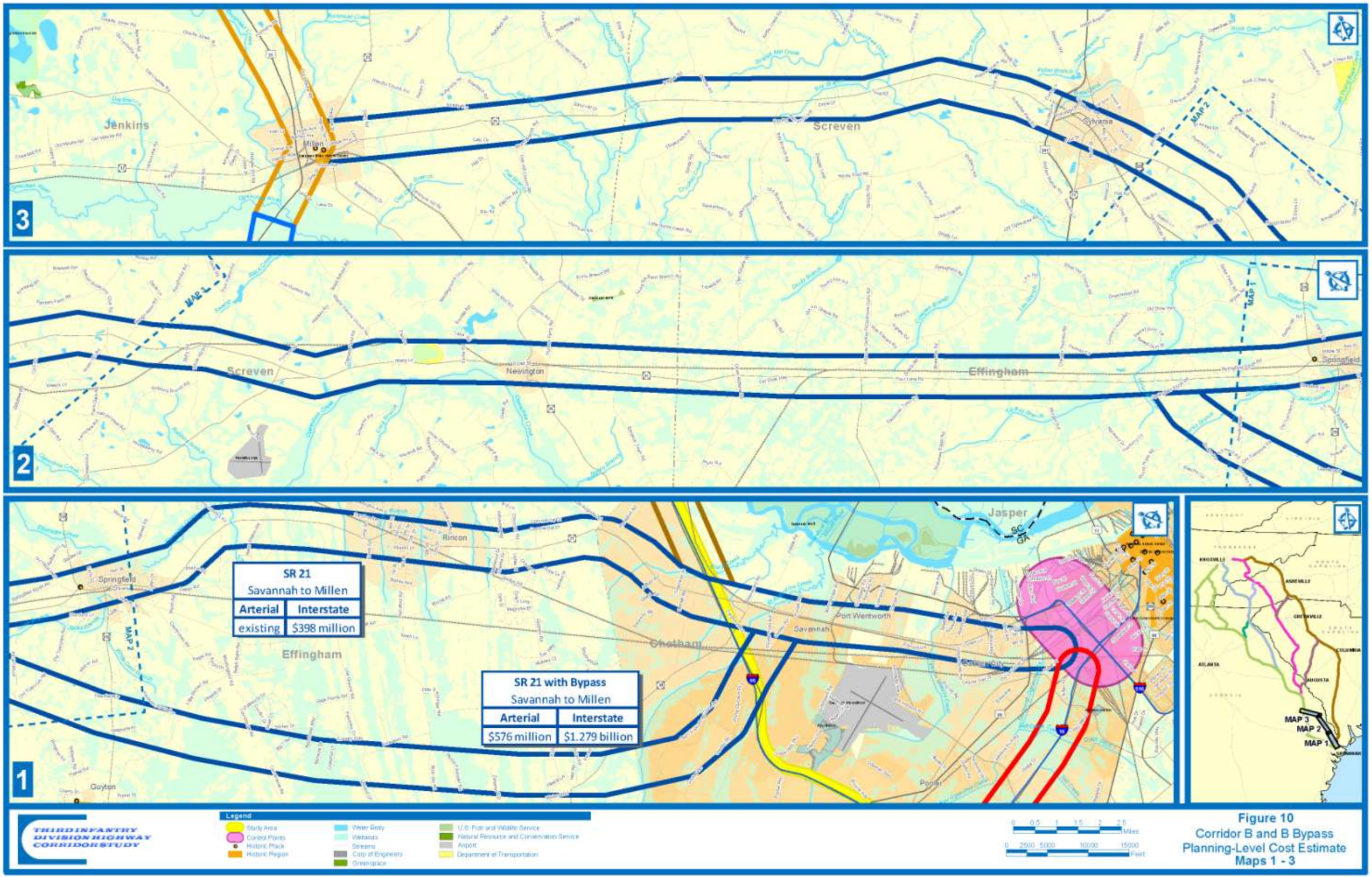


Figure 10
Corridor B and B Bypass
Planning-Level Cost Estimate
Maps 1 - 3

Assumptions: Right-of-way is urban and contains a mix of residential and commercial uses.
Cost Estimate:

Table 11 – Costs: Corridor B and B Bypass

	Arterial	Interstate
Corridor B (Savannah to Augusta)		
Engineering	existing	$58 million
ROW	existing	$71 million
Utility	existing	$95 million
Construction	existing	$174 million
Project Total	existing	$398 million
Corridor B Bypass (Savannah to Augusta)		
Engineering	$58 million	$128 million
ROW	$183 million	$273 million
Utility	$29 million	$73 million
Construction	$306 million	$805 million
Project Total	$576 million	$1.28 billion

Total costs to implement Corridor B or B Bypass along with the northern portion of Corridor A West are shown in **Table 12** for the entire corridor length from Savannah to Knoxville.

Table 12 – Corridor B and B Bypass Costs

	Min. Build	Super-2	Arterial	Interstate
Corridor A West	$701 million	$1.2 billion	$2.5 billion	$4.8 billion
Corridor B/A West	$701 million	$1.2 billion	$2.5 billion	$5.2 billion
Corridor B Bypass/ A West	$701 million	$1.2 billion	$3.1 billion	$5.9 billion

d. No Build (Signing Only) Costs

The No Build option would cost significantly less than the other corridors considered. An 8-foot by 4-foot panel sign costs approximately $525. Depending on the route selected, number of signs required, and complexity of the branding, this alternative could be implemented for less than $500,000, including costs for planning, coordination, design, materials, and installation.

5.4 Uncertainties and Risk

Risk is a major concern which should be addressed in all cost estimates. Because corridors have only been developed at a conceptual level, a large number of unknown factors can have a significant impact on the overall project costs shown. The discussion below highlights categorical risks that are likely to influence project costs.

Project lacks clear definition. Prior to design tasks, the actual work involved in completing corridor improvements is undefined. For this conceptual study, costs are based solely on statewide averages and the project length. There has been no systematic analysis of existing needs or deficiencies to identify existing geometric issues along highway segments or at intersections that may require improvements. If any project segments are identified for additional development, this type of uncertainty will decrease as the project is more clearly defined, as shown in **Figure 11**.

Inflation. Each year, inflation decreases the buying power of the dollar. As a result, prices for goods and services tend to increase annually. Typically, inflation is estimated as a 2 to 4 percent increase per year. Not accounting for any other risk factors, a $1 billion project in 2010 will cost $1.3 billion by 2020 and $1.8 billion by 2030 at a 3 percent inflation rate.

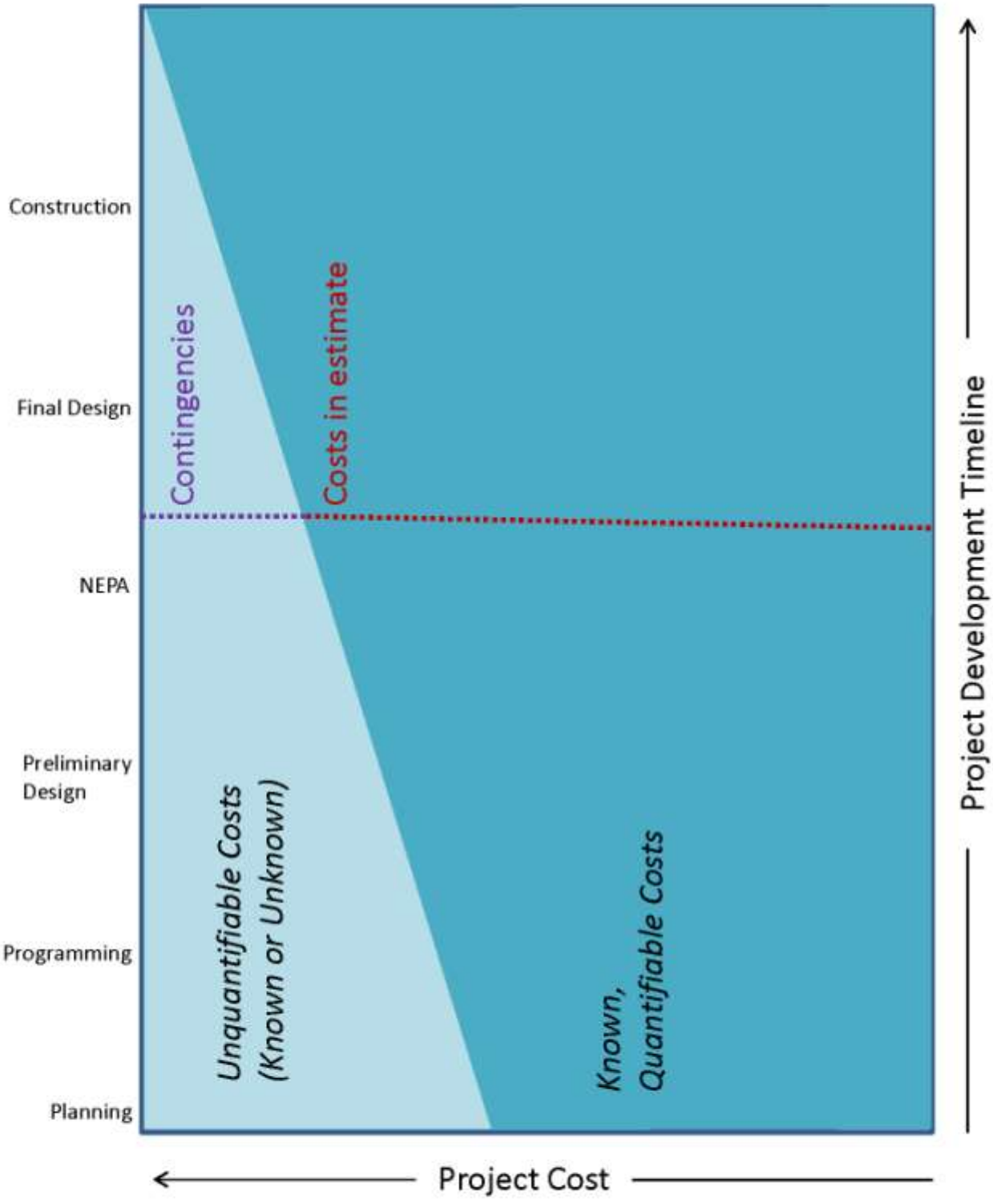
Delays in implementation. Due to the size and complexity of the corridor, there is a high probability for schedule delays if any projects in the corridor are identified for implementation. Delays can occur due to a number of reasons:

- Unforeseen challenges, from engineering issues to litigation
- Funding availability
- State programming priorities
- Data requirements during the environmental analysis phases
- Specific consultation requirements under the NEPA, Section 404, Section 7, Section 106, or other Federal regulations[6]
- A lack of stakeholder consensus
- Landowners unwilling to sell properties
- Permitting requirements imposed by regulatory agencies

A typical highway project can take at least 12 years to advance through the project development process from an idea to an operational facility; larger or more controversial projects are likely to take longer. Delays can have sizeable impacts on project costs, due to inflation and other factors which escalate costs over time.

[6] NEPA requires Federal agencies to prepare detailed statements assessing the environmental impact of and alternatives to actions, with an emphasis on interdisciplinary coordination between agencies. Section 404 of the Clean Water Act allows the U.S. Army Corps of Engineers to issue permits to discharge any dredged or fill materials into navigable waterways once certain public notice requirements are satisfied. Section 7 of the Endangered Species Act requires Federal agencies to ensure their actions will not jeopardize threatened/endangered species or critical habitats. Section 106 of the National Historic Preservation Act defines a process for agencies, preservation groups, and other stakeholders to balance historic preservation concerns against the needs of Federal undertakings.

Figure 11: Cost Uncertainties During Project Development



Indirect risks. Changes in global economies and political climates can also lead to uncertainties which affect project costs. In the last 5 years, the construction industry has seen high volatility in the construction price index driven by the building boom in Asia. The recent recession has seemed to dampen this volatility somewhat. Oil prices, steel demands in growing nations, declining gas tax revenues, and myriad other factors can impact projects.

In light of these uncertainties, the planning-level costs presented above should be interpreted as a starting point. Contingency factors built into the estimates – 10 to 30 percent of the total cost – help account for some of these risk elements. Despite built-in contingencies, costs could be significantly higher if any projects within the corridor are identified for implementation.

Costs represent a high-level starting point and could be significantly higher if any projects are identified for implementation.

5.5 Costs and Year of Expenditure

In light of the high level of uncertainty inherent in this conceptual feasibility study, costs shown below for the four build alternatives are rounded to the nearest hundred million dollars. Per TDOT standard practice, a 3.6 percent annual inflation rate has been applied to costs presented earlier in this chapter. Because a timeline has not been defined for any projects which could be identified from this study, **Table 13** below presents estimated costs in year of expenditure dollars for a range of dates. As discussed in the previous section, these costs represent high-level estimates which are subject to numerous uncertainties and external factors that can greatly influence actual costs. Estimates presented represent an order of magnitude, showing how implementation delays and inflation can influence costs.

6.0 PROJECT DEVELOPMENT PROCESS

This study is not intended to recommend any alternative for implementation; it will not lead to any further planning beyond Phase II of this study, design activities, right-of-way acquisition, or construction activities for any specific highway improvement unless State and local transportation decisionmakers determine additional project development steps are warranted. The following discussion is included to identify key steps that would be necessary if a project were identified for further development.

Table 13 – Projected Year of Expenditure Cost Estimates

	Alternative	Min. Build	Super-2	Arterial	Interstate
2010	A West	$700 Million	$1.2 Billion	$2.5 Billion	$4.8 Billion
	A West (Dalton Spur)	$600 Million	$900 Million	$2.0 Billion	$4.2 Billion
	B/A West	---	---	$2.5 Billion	$5.2 Billion
	B Bypass/A West	---	---	$3.1 Billion	$5.9 Billion
2020	A West	$1.0 Billion	$1.7 Billion	$3.6 Billion	$6.9 Billion
	A West (Dalton Spur)	$800 Million	$1.2 Billion	$2.9 Billion	$6.0 Billion
	B/A West	---	---	$3.6 Billion	$7.4 Billion
	B Bypass/A West	---	---	$4.4 Billion	$8.4 Billion
2030	A West	$1.4 Billion	$2.5 Billion	$5.1 Billion	$9.8 Billion
	A West (Dalton Spur)	$1.1 Billion	$1.8 Billion	$4.1 Billion	$8.5 Billion
	B/A West	---	---	$5.1 Billion	$10.5 Billion
	B Bypass/A West	---	---	$6.2 Billion	$11.9 Billion
2040	A West	$2.0 Billion	$3.5 Billion	$7.2 Billion	$14.0 Billion
	A West (Dalton Spur)	$1.6 Billion	$2.5 Billion	$5.9 Billion	$12.1 Billion
	B/A West	---	---	$7.2 Billion	$14.9 Billion
	B Bypass/A West	---	---	$8.9 Billion	$17.0 Billion
2050	A West	$2.9 Billion	$5.0 Billion	$10.3 Billion	$20.0 Billion
	A West (Dalton Spur)	$2.3 Billion	$3.6 Billion	$8.4 Billion	$17.2 Billion
	B/A West	---	---	$10.3 Billion	$21.3 Billion
	B Bypass/A West	---	---	$12.7 Billion	$24.2 Billion

The project development process for highway projects is primarily a linear process that is prescribed by Federal and State requirements. It includes the following components:

- Identifying a problem (defining purpose and need)
- Analyzing alternative solutions and their impacts
- Finding a recommended solution to address that problem (identifying a preferred alternative)
- Defining the scope and cost of a project to provide that solution
- Finding and programming funds to implement the project
- Implementing the project in accordance with Federal and State policies, standards, guidelines, laws, and regulations.

Although all States have similar processes for project development, each has special requirements based on that State's own administrative, regulatory, and legislative requirements.

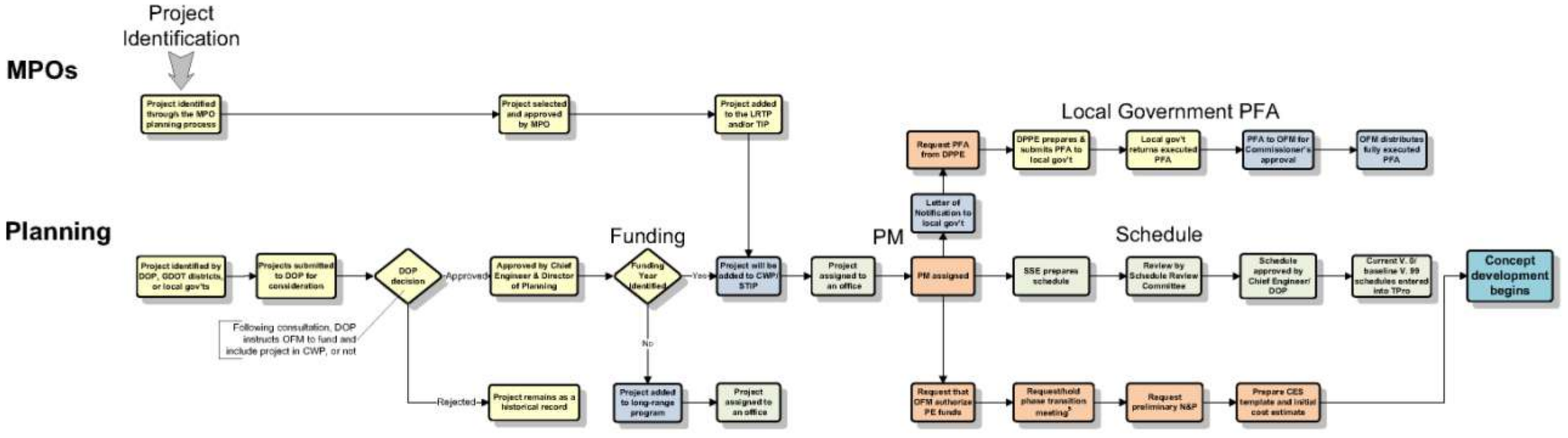
Depending on the size and scale of the project, the project development process can be complex, involving 200+ major steps, with approvals or input required from numerous Federal agencies, State agencies, and other stakeholders. The various steps in the project development process for GDOT are shown in **Figure 12** and the steps in the TDOT *Program, Project, and Resource Management Plan* process are shown in **Figure 13**.

Figure 12a

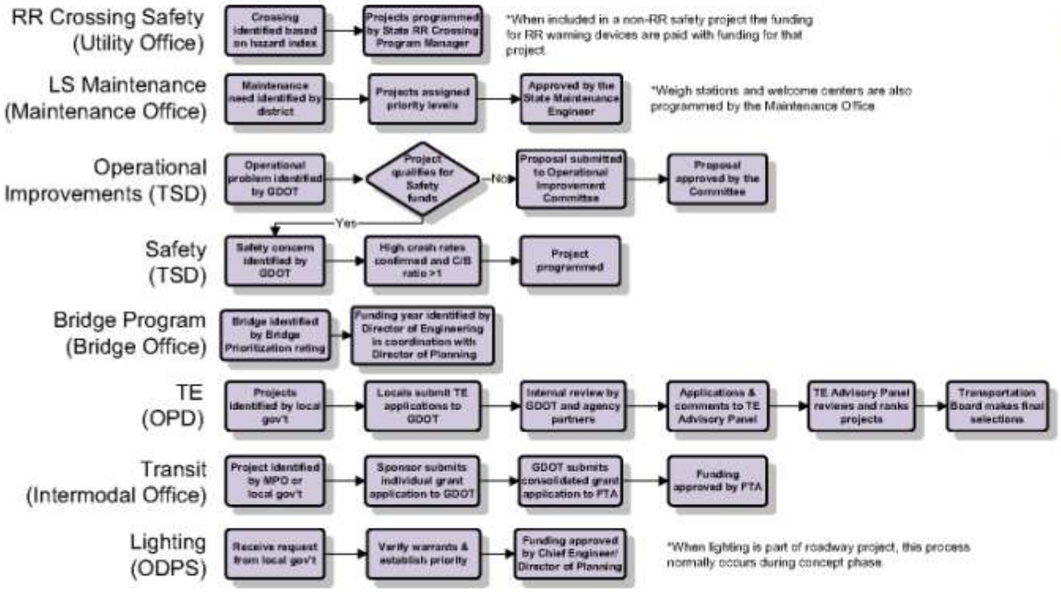
Planning and Programming Process

GDOT Office of Design Policy and Support

Friday, April 30, 2010



Special Program Projects



Color Coding	GDOT Office	
	Planning	PM Office
	Financial Management	as noted
	Program Control	

Notes:

1. This chart reflects the normal process for planning and programming common types of projects. Please refer to the PDP text for additional details.
2. This chart is not meant to supersede the PDP text and it is recognized that specific constraints and conditions may require some variation from the process shown here.
3. Procedures for design-build are contained within the GDOT Design-Build manual prepared by the Office of Innovative Program Delivery.
4. After PE funds have been authorized, a SUE Request Form should be submitted by the PM if project is a candidate for SUE.
5. The phase transition meeting should include the PM, the sponsor of the project, and the Office of Planning. The project sponsor (or Office of Planning) will provide all available project information generated to date. This may include such items as planning studies, a preliminary N&P, traffic studies, BCA analyses, IJRs, coordination related to logical termini, and summaries of formal project meetings.

List of Acronyms:

AASHTO = American Association of State Highway & Transportation Officials
BCA = benefit to cost analysis
CES = AASHTO Trns*port cost estimating system
CWP = Construction Work Program
DOP = Director of Planning
DPPE = District Planning & Programming Engineer
FTA = Federal Transit Administration
IJR = Interchange Justification Report
LRTP = Long Range Transportation Program
LS = lump sum
MPO = metropolitan planning organization
N&P = need and purpose statement
ODPS = Office of Design Policy & Support
OFM = Office of Financial Management
OPD = Office of Program Delivery
PDP = Plan Development Process
PE = preliminary engineering
PFA = Project Framework Agreement
PM = project manager
RR = railroad
SSE = State Scheduling Engineer
SUE = overhead/subsurface utility engineering
STIP = State Transportation Improvement Plan
TE = transportation enhancement
TIP = Transportation Improvement Program
TPro = GDOT project management system computer program
TSD = Office of Traffic Safety & Design

Figure 12b

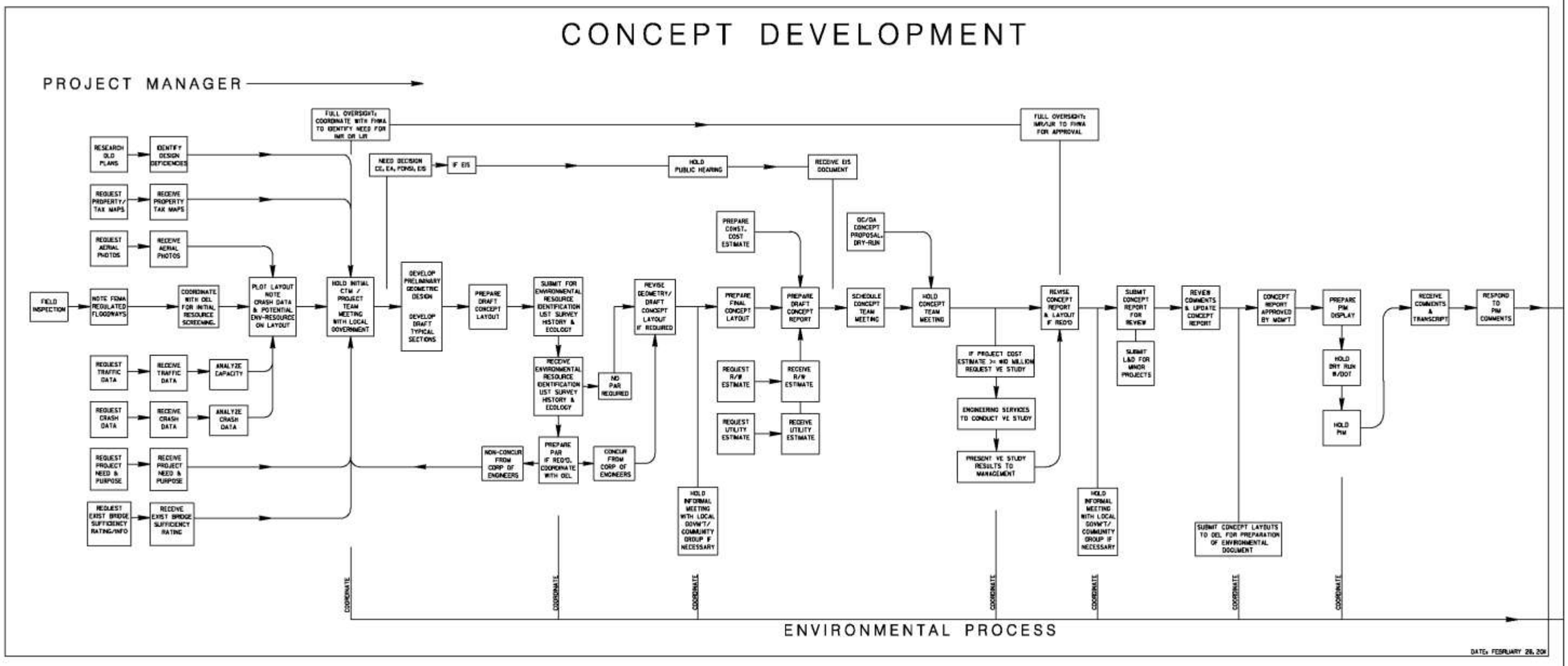


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Figure 12c
Preliminary Plan Development Process

GDOT Office of Design Policy and Support

Friday, August 06, 2010

List of Acronyms:
4(f) = section 4(f) documentation
BFI = bridge foundation investigation
CBA = Cost-to-Benefit analysis
CE = categorical exclusion
DTM = digital terrain model
DUO = District Utility Office
EA = Environmental Assessment
EIS = Environmental Impact Statement
EPE = Existing Pavement Evaluation
E&S = erosion and sediment control
FEMA = Federal Emergency Management Agency
FHWA = Federal Highway Administration
FONSI = Finding of No Significant Impact
GEPA = Georgia Environmental Policy Act
H&H = hydrologic and hydraulic study
HW = hazardous waste
LGLA = local government lighting agreement
NEPA = National Environmental Policy Act
ODPS = Office of Design Policy & Support
PDP = plan development process
PFPR = preliminary field plan review
PL = preliminary bridge layout
PM = project manager
QA = quality assurance
QC = quality control
QL = quality level
ROD = record of decision
S&M = signing and marking
SE = superelevation
SHPO = State Historic Preservation Officer
SS = Soil Survey
SSUE = State Subsurface Utilities Engineer
SUE = Overhead/Subsurface Utility Engineering
UST = underground storage tank
VE = Value Engineering

Specific outreach activities in accordance with project public involvement plan

Concept report approved
Finalize design criteria summary
Prepare typical sections
Prepare layout, horizontal and vertical alignments
QA Geometric Review
Prepare intersection sight distance study & SE calcs
Geometry
Prepare traffic engineering report, if req'd
Update traffic analyses, if req'd
Obtain signal permit, if req'd
Submit design exceptions and variances, if required
Traffic Studies
Perform Concept Validation**
Revise Concept Report, if required
**If significant amount of time has elapsed between approval of concept and start of preliminary design.
Hold VE study, if required and not already held.
Confirm location of streams and delineation of buffers
Return marked-up roll plots to design
Submit roll plots for QA of state waters & stream buffers
Perform UST/HW field reconnaissance
Prepare UST/HW site investigation package
USTs
Lighting Agreement
Prepare/ Submit LGLA to local gov't
Local gov't returns executed LGLA
LGLA to ODPS for Commissioner's approval
ODPS distributes fully executed LGLA
Where lighting is required
Set up task order for lighting design prior to completion of preliminary phase.
Conduct air and noise studies
Determine need for noise abatement
Perform archeological survey
Archeology survey to SHPO for concurrence
Obtain SHPO concurrence on history and archeological assessment of effects
Prepare 4(f) evaluation, if req'd
Assess effects
Prepare ecology assessment of effects report
Section 7 Consultation, if req'd
Assess Effects
Prepare Conceptual Stage Studies
Submit plans to environmental
Environmental
Preparation of the "green sheet"
Prepare CE
Submit to FHWA for approval
Prepare draft EA*
Submit to FHWA for approval
Receive FHWA approval
Hold public hearing open house
Submit final EA/FONSI to FHWA
Environmental Document
Submit request to revise location of state route, if req'd
Receive approval of final environmental (NEPA) document
*See Chapter 6 of the PDP for GEPA and for EIS/ROD type documents.
Prepare special provisions
Prepare landscaping plans
Perform drainage calculations
Prepare S&M and signal plans
Drainage
Set preliminary R/W & easements
R/W
Hold detour meeting, if req'd
Revise R/W and easements, if req'd
Resubmit plans to environmental, if req'd
Complete drainage layout and earthwork cross-sections
Prepare staging plans
QA constructability review
Prepare drainage sections
Prepare erosion control plans
QA preliminary plans review
Request PFPR meeting
Hold PFPR meeting
Distribute PFPR report
E&S
PFPR
Prepare draft special provisions
Hydraulics & Structural
Request SS & EPE (if req'd)
Request H&H report
Set bridge length & layout spans
Receive approval of hydraulic study and PL
FEMA Coordination, if req'd
Perform sediment storage calculations
Request EPE as soon as extent of pavement overlay can be reasonably defined.
Can begin when geometry in vicinity of bridge is complete.
Stake proposed centerline
Prepare preliminary bridge layout
Submit Hydraulic study for approval
Stakeout bridges
Submit bridge salvage request, for bridge replacement
Request BFI
Field check property/survey database
Request by PM for consultant surveys.
Survey
Mapping
Request mapping aerial photography
Receive aerial photos
Request mapping
Set photo and ground control
Review GPS/Control Package
Prepare photo & DTM mapping database
Receive/review mapping and DTM
Request by PM for consultant surveys.
If not performed for Concept, Flights for aerial surveys are flown between Jan. and March.
Request survey enhancements
Field Enhancements
Conduct pre-survey meeting
Obtain plats and deeds
Perform field survey*
Enhance survey database; Property statistics report
*Including hydraulic engineering field report, existing bridge surveys, stream surveys, & culvert inspections.
Update utility plans to include exiting utilities
Utilities
SUE
Use of SUE approved for project
Yes
No
Hold SUE kick-off meeting
Perform SUE QL C/B investigation
SSUE reviews/ sends SUE plans to PM
DUO submits SUE plans to utility companies for review
Utility companies return electronic files with corrections
SUE reviews/sends accepted plans to PM & DUO
1st Utility Submission
PM sends request for 1st submission
DUO sends request to utility companies
Utility companies Return files with electronic markups
DUO reviews/ forwards electronic markups to PM
Handled using DUO procedures for electronic transfer of utility plans. Utilities unable to handle plans electronically will be sent paper plans.
SUE
Perform SUE utility Impact Analysis, if req'd
Preliminary/PFPR Plans Development

Note:

1. This chart was developed in the context of a major roadway project. See the PDP manual for specific requirements for other project types.
2. This chart illustrates the normal flow of activities accomplished during preliminary phase plan development and is not meant to take the place of actually reading and becoming familiar with the guidelines presented in the PDP manual. Project-specific constraints and objectives may require some varying of the process. It is recommended that the PM consult with the responsible office with any questions relating to the need for or timeframe within which a specific task should be accomplished.
3. Preliminary plan development can take anywhere from several months to a few years. As a schematic this chart does not propose to be to any scale with to respect time.
4. After submitting plans to environmental any changes to construction limits or R/W must be coordinated in a timely manner with the NEPA team member to ensure appropriate consideration in the environmental document.
5. A value engineering study should be held sometime between the concept team meeting and completion of the early part of preliminary design. The actual timing selected will depend on the character of the project and when sufficient geometric design work is complete to allow for a meaningful study.
6. A soil survey report is not required for minor projects such as traffic signals, ATMS, intersection improvements, landscaping and lighting projects. See the Chapter 6 of the PDP for a list of counties were a soil survey report is required at PFPR.
7. Design phase leaders will make available to the project PM upon request all QC/QA documentation (e.g., checked construction plan sheets, calculations, reports, cost estimates, etc…). This documentation should be complete and consistent with the requirements of their approved QC/QA policy.

Figure 12d
Final Plan Development Process

GDOT Office of Design Policy and Support

Tuesday, March 15, 2011

Note:

1. This chart was developed in the context of a major roadway project. See the PDP for specific requirements for other project types.

2. This chart illustrates the normal flow of activities accomplished during final phase plan development and is not meant to take the place of actually reading and becoming familiar with the guidelines presented in the PDP manual. Project-specific constraints and objectives may require some varying of the process. It is recommended that the PM consult with the responsible office with any questions relating to the need for or timeframe within which a specific task should be accomplished.

3. Final plan development can take anywhere from several months to a few years. As a schematic this chart does not propose to be to any scale with respect to time.

4. Changes to the construction plans that increase or decrease the required construction limits, affect the environmental analysis or increase or decrease the required right-of-way must be coordinated in a timely manner with the NEPA team member for possible reevaluation of the environmental document and permits.

5. Design phase leaders will make available to the project PM upon request all QC/QA documentation (e.g., checked construction plan sheets, calculations, reports, cost estimates, etc…). This documentation should be complete and consistent the requirements of their approved QC/QA policy.

"no-change reevaluations" require no field studies and are often approved by GDOT

Environmental Reevaluation

Perform required field studies

Prepare/submit reevaluation

Receive approved reevaluation

Yes

Reevaluation required?

No

Obtain corrolary permits

Submit list of changes to environmental

Perform field studies

Coordinate with government agencies

Prepare reevaluation

Submit Reevaluation to FHWA

Receive approved reevaluation

Prepare Stream Buffer Variance

Submit SBV to EPD

SBV Published by EPD & GDOT

Receive approved variance

Environmental Permits/Reevaluation

What type of permit required?

NWP/RP

Apply for NWP & RP 404 permits

Submit PCN to USACOE

USACOE publishes PCN

Receive permit

IP

Apply for 404 Individual Permit

Submit to USACOE

USACOE publishes Joint Public Notice

Receive individual Permit

Environmental Certification

Certify Environmental

PFPR Report

Distribute PFPR report

This is the start of the final phase

Distribute PFPR Responses

Revise plans to address PFPR report

Request Soil Survey

If not already requested prior to PFPR

R/W Plans

Complete draft R/W plans

QA review of draft R/W plans

Update draft R/W plans, if req'd*

Finalize geometry

*Approval of design exceptions should be obtained prior to completion of R/W plans.

Final Pavement Design

Receive SS Summary

Prepare pavement design

Submit pavement design package to committee

Pavement design approved

Roadway Design

Finalize drainage design

Finalize staging plans

Finalize erosion control plans

Finalize signing & marking and signal plans.

Prepare quantities

*including SP 108 & SP 150.11

Submit special provisions*

Approval of special provisions

FFPR

QA of FFPR plans

Request FFPR meeting*

Hold FFPR meeting

*ESPCP plans submitted for the FFPR will be separately reviewed for GDOT designed projects.

Distribute FFPR Responses

Distribute FFPR report

QA final plans submittal

Submit corrected plans to OES

OES submits final cost estimate

Final Plans

Submit work authorization

Submit final plans to OBA

Receive Construction Authorization

Construction Authorization

FFPR, begin 24-week schedule to letting

Submit L&D report

Receive L&D Approval

L&D Approval Advertisement

Submit hard copies to R/W office and electronic files to ODPS

L&D Notice

Receive BFI/WFI

Structural Design

Prepare/Submit draft structural plans

Prepare/Submit wall envelopes

Correct/Resubmit final structural plans & wall envelopes

Receive final bridge plan & wall envelope approvals

Performed during preliminary design for urban projects

Lighting

Includes high mast lighting?

No

Yes

Request/ Receive fdn investigation

Prepare structural footing design

Submit final lighting plans

Final lighting plans approved

Request temp. state route, if required

Perform FAA* coordination for high mast lighting

*If required.

Prepare/Submit photometric layout

Approve photometric layout

R/W authorization

R/W Office review

Receive R/W plan approval

Detailed R/W cost estimate

R/W Authorized

R/W acquisition

Stake R/W

Hold property owners meeting

Deed research and property appraisals

R/W negotiations

Prepare deeds

Prepare R/W revisions as needed.

R/W Certification

Close parcels

Handle displacements and relocations

Handle improvements, USTs, demolition & removal

Certify R/W

OMR performs UST/HW screening & distributes report

UST/HW

Utilities

If not performed prior to PFPR

Perform utility impact analysis

SUE

Use of SUE QL A req'd?

No

Yes

Hold utility coordination meeting to decide location of QL A test holes

Submit plans for utility relocation

Receive utility relocations & adjustment schedules

Update utility plans

Resolve utility/ design conflicts

Obtain required R/W & easements, if required

Perform QL-A test holes, if req'd

SUE

Prepare utility relocation construction plans

Complete utility agreements

Utilities & RR Certification

Certify Utilities & RR

Send First RR Submittal

Geometry, drainage, and staging affecting RR should be complete.

Submit revised plans and responses, if req'd

Railroad Coordination

Send Second RR Submission

Prepare RR agreements and special provision

Design Approval and R/W Authorization

R/W Acquisition and FFPR Plans

Final Plans & Construction Authorization

List of Acronyms:

BFI = bridge foundation investigation
EPD = Environmental Protection Division of the Department of Natural Resources
OES = Office of Engineering Services
ESPCP = erosion, sediment and pollution control
FAA = Federal Aviation Administration
fdn = foundation
FFPR = final field plan review
FHWA = Federal Highway Administration
HW = hazardous waste
L&D = location and design
NEPA = National Environmental Policy Act
NWP = nationwide permit
OBA = Office of Bidding Administration
ODPS = Office of Design Policy and Support
OMR = Office of Materials and Research
PCN = pre-construction notification
PDP = plan development process
PFPR = preliminary field plan review
QA = quality assurance
QC = quality control
QL = quality level
RP = regional permit
RR = railroad
SBV = stream buffer variance
SS = Soil Survey
SUE = Overhead/Subsurface Utility Engineering
USACOE = US Army Corps of Engineers
UST = underground storage tank
WFI = wall foundation investigation

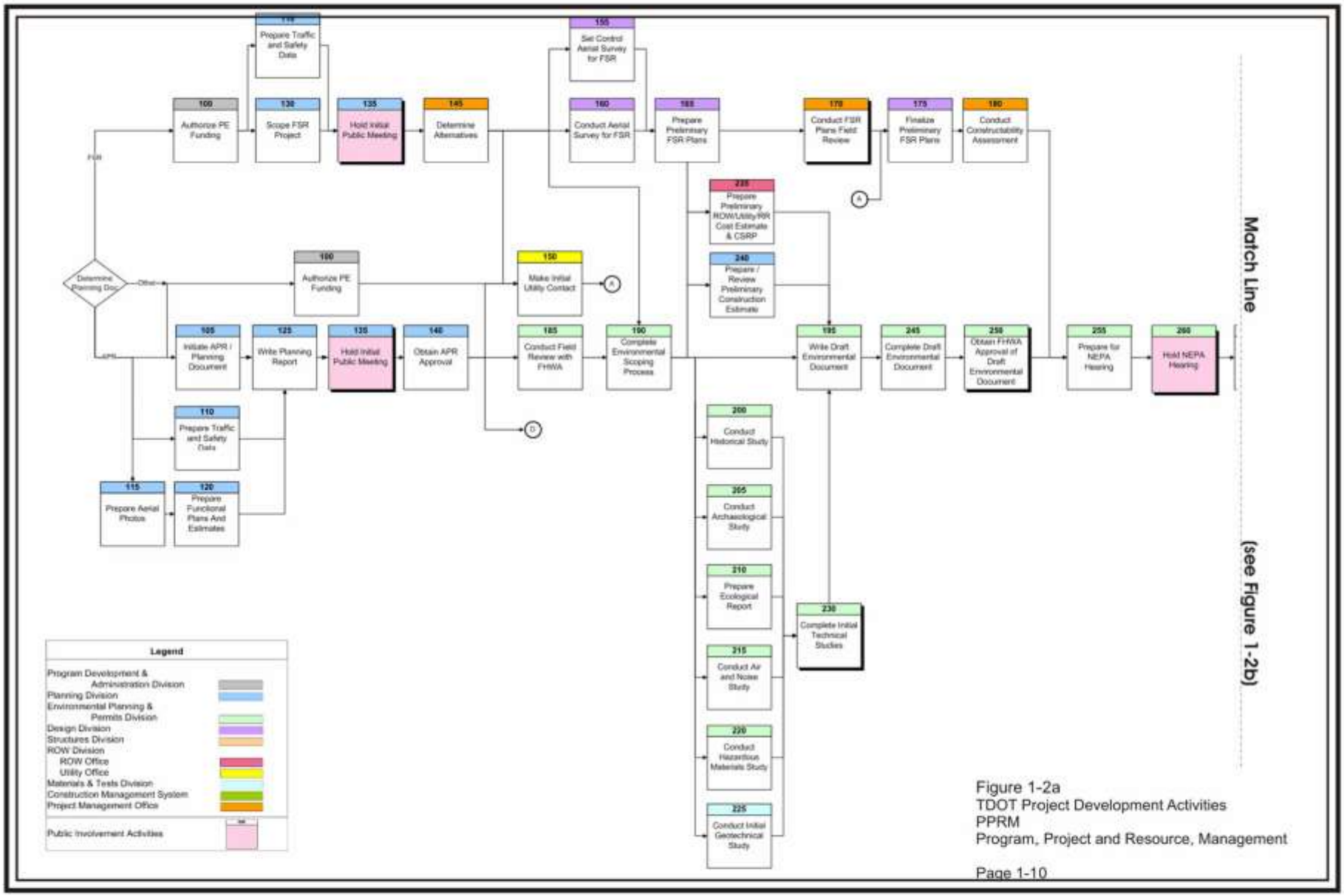


Figure 1-2a
TDOT Project Development Activities
PPRM
Program, Project and Resource, Management

Page 1-10

Figure 13a
TDOT Program, Project, and Resource Management Plan process

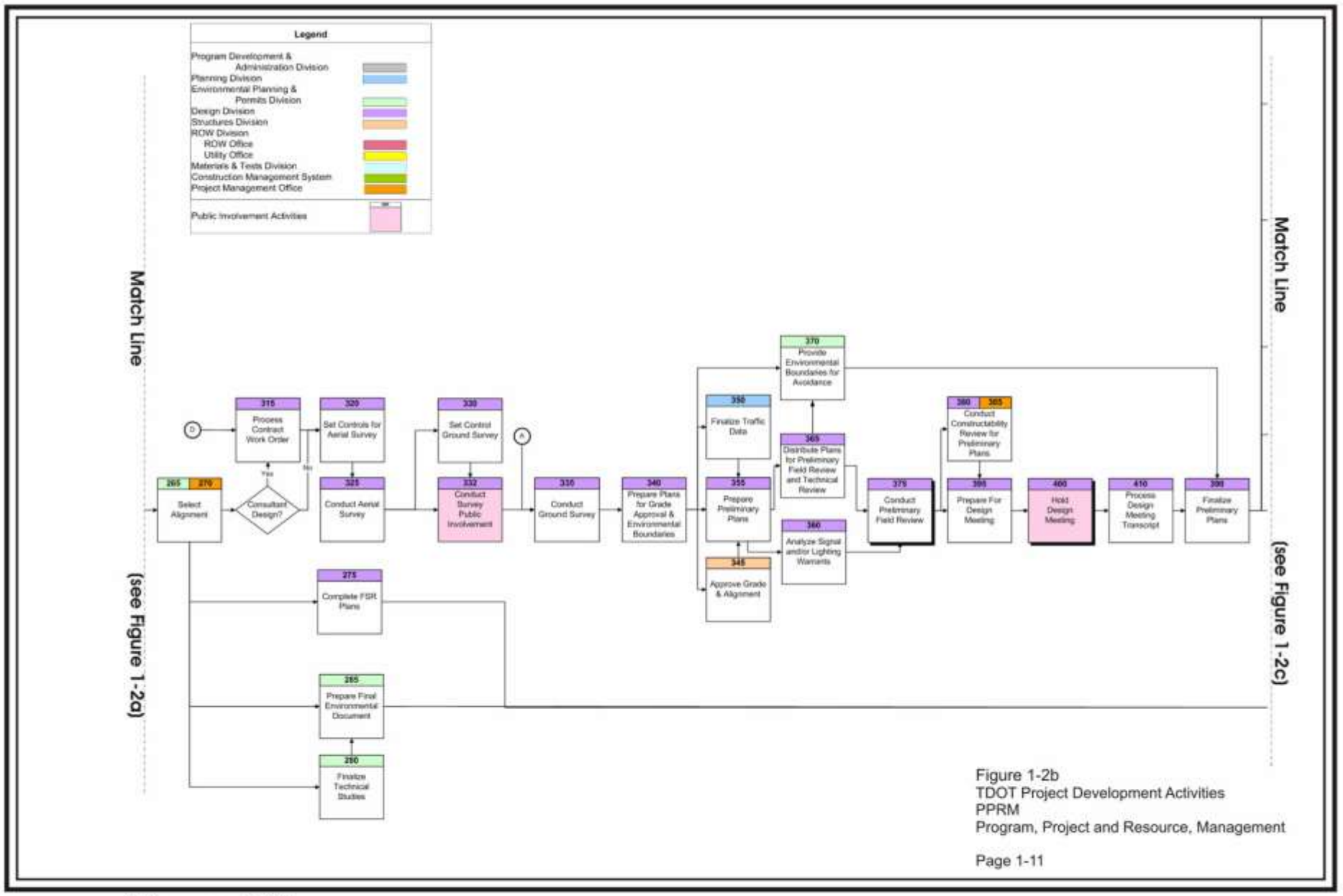


Figure 1-2b
TDOT Project Development Activities
PPRM
Program, Project and Resource, Management

Figure 13b
TDOT Program, Project, and Resource Management Plan process

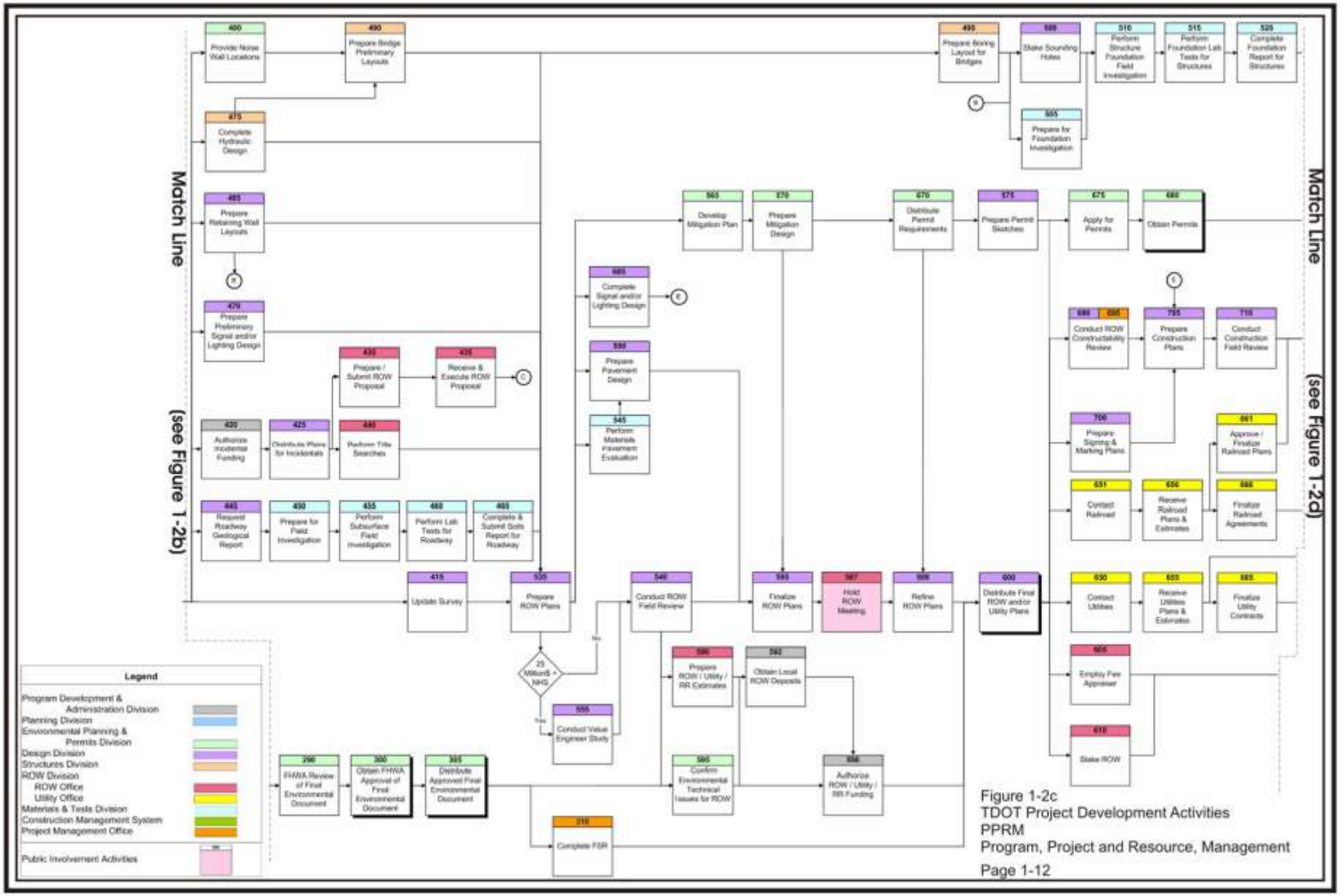


Figure 13c
TDOT Program, Project, and Resource Management Plan process

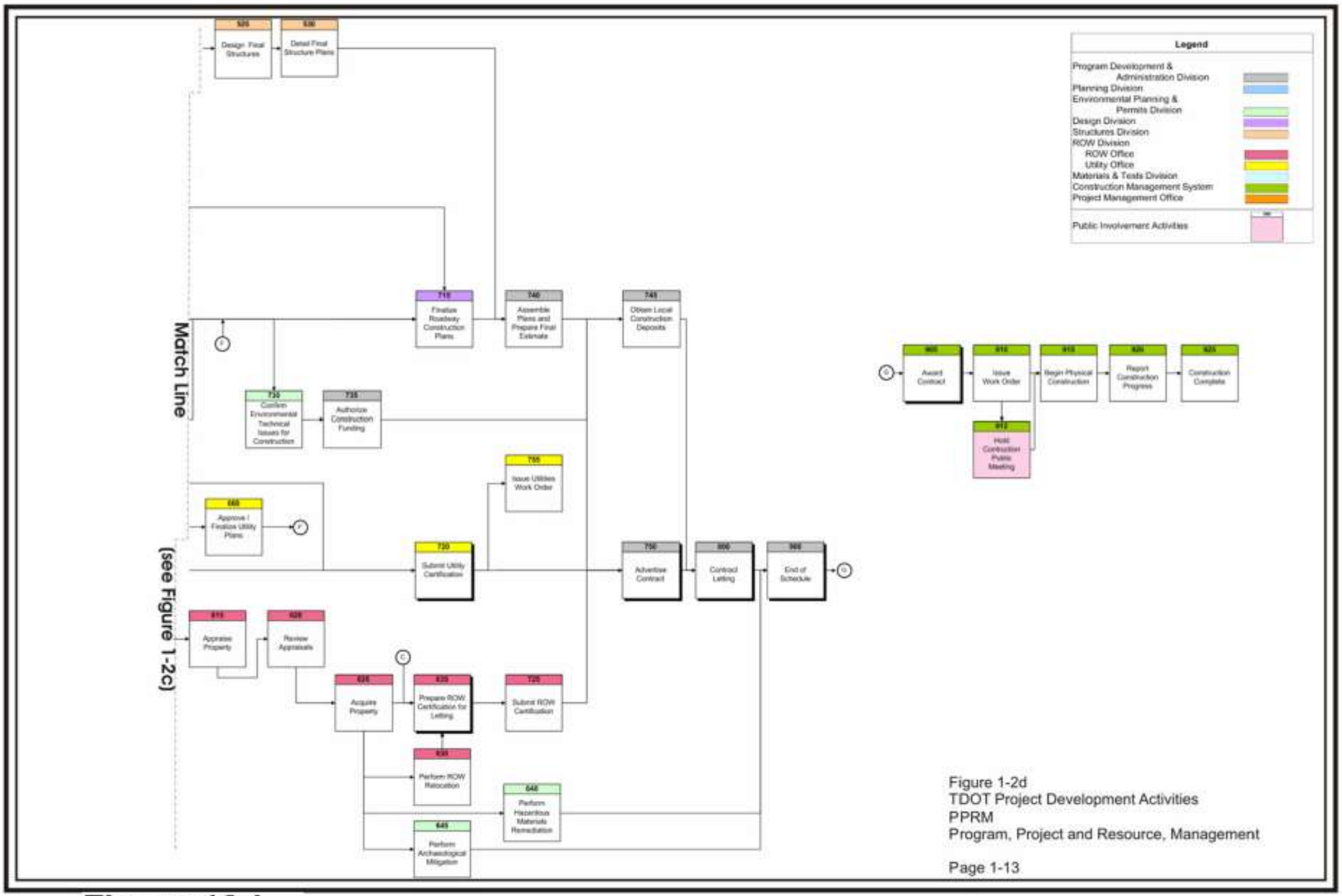


Figure 1-2d
TDOT Project Development Activities
PPRM
Program, Project and Resource, Management

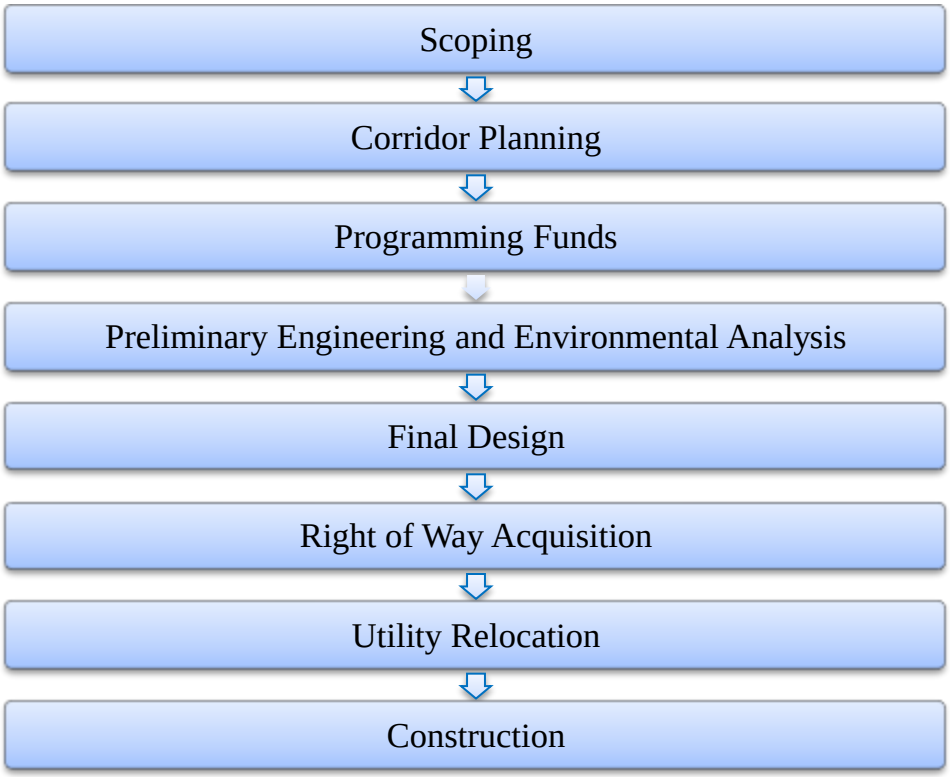
Figure 13d
TDOT Program, Project, and Resource Management Plan process

Often, it is not practical to improve the entirety of one lengthy corridor at once; the corridor must be divided into manageable sections. Ideally, these would be Sections of Independent Utility (SIUs), in which a long corridor is broken into smaller sections so that improvements to each smaller improvement project would have independent utility with logical termini, even if the remainder of the proposed improvements along the entire corridor were not completed. While it is too early to try to break up the 3rd Infantry Division Highway corridor into SIUs, the recently 156-mile Savannah River Parkway was constructed as 15 segments for an example.

If a large, multistate corridor like the 3rd Infantry Division Highway corridor were selected for further development, there are several organizational structures that could be utilized for further development.

- Each State may elect to pursue any project(s) independently on its own using State or Federal funds.
- States may create a multistate coalition (via a Memorandum of Understanding) to guide mutually agreeable goals and priorities for the project.
- States may enter into a formal interstate compact that would define specific projects, priorities, funding sources, and other terms for implementation.

Regardless of the mechanism, each State would address project development in a similar manner generally using the following steps:



Typically, the major challenges will be at the front and back ends of the project development process. At the beginning, the challenge is to determine whether improvements are justified and whether funds should be committed to pursue those improvements. Assuming a project goes forward, finding funding for the construction of all the proposed improvements is another major challenge.

The following discussion provides a summary of key phases necessary for project development and implementation. This is not intended to be an all-encompassing discussion, but only to provide a sufficient overview to explain the type and complexity of task needed for project delivery.

6.1 Scoping

Any project(s) identified for implementation should address an existing transportation need. Needs can be identified by a variety of sources: MPOs, elected officials, the public, or through the long-range planning processes. If policy-makers determine additional study is warranted, an analysis of overall needs and deficiencies within the 3rd Infantry Division Highway corridor could occur at two levels:

- First, needs and deficiencies must be considered in the context of the multistate highway system to determine whether (1) there are route deficiencies or other constraints along the existing highway system or (2) there are gaps in system connectivity or access to communities, economic centers, or other attractions.
- Second, for projects along existing routes, a more detailed analysis is needed to determine if the existing roadways demonstrate any physical or operational deficiencies. This effort could include analyzing data to identify any current or future problems related to safety, capacity, level of service, highway geometrics, access, drainage, structural issues, or other factors on a case-by-case basis.

It is possible that a needs/deficiencies analysis could identify multiple needs, either from a system-wide perspective or through the analysis of existing facilities. Depending on the results of this analysis (which has not been conducted for the 3rd Infantry Division Highway corridor at this time), needs could be identified that could be addressed through new highway routes, relocation of existing routes, reconstruction of existing routes, spot improvements (e.g. rehabilitating deficient structures), or some combination of these. Until decisionmakers have a thorough understanding of the transportation needs, it is premature to identify whether improvement projects should be pursued.

a. Purpose and Need

A key element of any proposed project is the development of a Purpose and Need Statement that describes the need for a proposed project and how the proposed project will meet that need. In other words, it states the problem (e.g., safety or

congestion) and why the project is being proposed (e.g., to reduce fatalities or improve capacity). The purpose should not be a specific solution, but must focus only on what the project is trying to achieve and why.

While the project purpose is defined on a customized, needs-specific basis, there are several generally accepted issues that can be addressed by highway improvements and are likely to be used in a Purpose and Need Statement. Some of the typical issues are economic development, national defense/security, legislative mandates, and goals from State or local transportation plans, such as improved mobility, connectivity, accessibility, safety, and level of service.

For the proposed 3rd Infantry Division Highway corridor, there could be multiple Purpose and Need Statements. If a corridor is selected for implementation, a statement should be developed to define the need for improvements to the entire corridor and to describe the overall purpose for constructing/improving routes between Savannah and Knoxville. In addition, this Purpose and Need Statement for the entire corridor would be expanded with further detail for each of the SIUs that make up the corridor, since each of the proposed improvements within those SIUs must be independently useful.

If a project becomes part of the State DOT's work program, the preliminary Purpose and Need Statement will continue to be reviewed and refined, if needed, as more information becomes available during the initial phases of project development.

6.2 Corridor Planning

After initial data collection during the scoping phase, a project will enter the Planning phase. Typically, it could take up to 2 years to complete a feasibility study of the overall corridor improvements or to complete an alternatives study within each SIU. For larger, more complex corridors, the Planning phase can take longer.

As with the Needs/Deficiencies Analysis, corridor planning can occur at two levels:

- First, the proposed corridor improvement may be reconsidered in the context of the MPO or statewide long-range transportation plan to evaluate whether there is justification for the project(s) on a system-wide basis. Likely, this "big picture" evaluation would be part of the initial justification analysis for the Programming phase to help decide whether the proposed project will be advanced, rejected, or studied further before a final funding decision is made.
- Second, a more detailed project-level planning analysis may be needed for each of the proposed SIU projects in a corridor. This analysis can serve two purposes. It can be used to confirm or deny that a need exists and provide more information as

to whether a project has merit and should go forward. If a need does exist, the planning-level analysis can then be used to better define the purpose and need, termini, project description and scope, and other factors to be considered as the project proceeds into future phases. Planning work may examine design criteria, environmental resources, community impacts, engineering issues, preliminary cost estimates, or other factors.

In Tennessee, these early stages of the project development process are documented in a *Transportation Planning Report* (TPR). The TPR defines the purpose and need for the project by looking at evaluation factors such as congestion relief, accessibility and mobility, economic development, goods/freight movement, and safety. A set of preliminary alternatives or options for addressing the transportation needs is also identified and evaluated; environmental surveys are initiated, using desktop databases and windshield surveys.

Other types of transportation planning documents include corridor studies (focusing on one corridor), sub-area studies (focusing on a small geographic area), needs assessment/identification studies, master plans (defining a broad vision for a corridor or area), feasibility studies, and implementation plans. A variety of these type of studies would be necessary if the 3rd Infantry Division Highway were selected for implementation, both at the corridor-wide level and for individual SIUs. Planning documents typically include a description of area needs/project purpose, a preliminary alternatives analysis, and overview-level information about environmental constraints.

a. State/MPO Coordination and the Transportation Improvement Program

Assuming that a project moves beyond the planning phase for future implementation, it will first be returned for further programming so funds can be identified for the next phase of the project. It is assumed that a combination of Federal and State funding will be needed for implementation if any projects are identified in the 3rd Infantry Division Highway corridor.

The project can then begin progressing through a series of prioritization steps at the State level, and at the MPO level for project in urban areas.

The *Long Range Transportation Plan* (LRTP) describes the strategies and actions guiding transportation system investments over a 20-year horizon. The LRTP is defined at both the MPO level and statewide. The LRTP may be built on major corridor studies completed in the Planning phase or may serve as a venue to identify major corridors that should be considered for planning analysis and further development. LRTPs typically address:

- Policies that will shape the future transportation network for the State/region
- Demands and needs, both present and future, facing the system
- Regional/statewide land use, development, and socioeconomic factors
- Projected costs and reasonably available funding sources

A variety of involvement techniques are employed to solicit input from stakeholders and interested members of the public. The LRTP for the MPO and State must be thoroughly coordinated to ensure consistency.

Before Federal funds can be authorized, any proposed project must be included in the *Transportation Improvement Program* (TIP), which is completed at the MPO and State level and lists the program of federally funded capital improvement projects to be accomplished within a 4-year period. The TIP/STIP identifies how the MPO/State DOT will allocate its limited funding to address transportation needs of the region/State, based on a clearly defined set of short-term priorities. Much more specific than the LRTP, the TIP defines actual projects identified for implementation, allocating funding for different phases. The STIP or TIP includes a project name and description, cost estimate, and implementation schedule based, respectively, on previous phase cost estimates, and the project priority, as assigned by the State DOT or MPO.

By Federal regulation, the TIP/STIP may include projects only if adequate funding can reasonably be anticipated to be available; projects must be prioritized by the State DOT or MPO in the competition for limited funding. The priority and implementation for a project may be determined by each agency's project prioritization process and criteria, which could include a variety of factors.

- How well will the project satisfy established goals set forth in the transportation plan?
- How will the project fit into the overall transportation system?
- What is the benefit-to-cost ratio?
- Is funding available?
- What input is available from previous planning efforts for the project?
- What input was provided by the public, stakeholders, and Federal, State, and/or local officials and agencies?

Again, given Federal and State funding cycles, it is estimated that it could take 1 year or more to acquire the necessary Federal and State funds and to incorporate any projects into the STIP and/or TIP. For areas which do not meet air quality attainment standards (Atlanta, Macon, Knoxville, and Chattanooga), the MPO

TIP development process requires a more complex analysis and can take much longer to complete.

6.3 Programming

Following Planning and inclusion in the TIP/STIP, the next step is the submittal of potential project(s) resulting from the needs analysis to State DOT decisionmakers for funding and for possible inclusion in the Department's work program. Using GDOT as an example, a proposed project would be submitted to GDOT's Project Nomination Review Committee, which decides whether it should be included in the GDOT *Construction Work Program (CWP)*. Typically, a potential project would be included if there is a reasonable justification for the project. This initial justification would be based on the preliminary Purpose and Need statement, which describes the transportation need and how the proposed project would meet that need.

After considering the justification for the project, State DOT decisionmakers may recommend approval, recommend further study, or reject the project. Approval or a decision for further study is generally a commitment to provide funding and to formally program the project(s) for further project development actions.

For GDOT, upon a favorable recommendation by the Project Nomination Review Committee and concurrence by the GDOT Chief Engineer, a proposed project would be submitted to the Director of Planning to approve its addition to the CWP. The CWP includes priority projects with committed funding during the next work program cycle. Projects that are not a top priority or that do not have sufficient funding may remain in the LRTP until a future version of the Work Program is issued. All major projects must have final approval from the Transportation Board before inclusion in the CWP and in GDOT's Project Management System.

a. An Incremental, Iterative Process

Programming is usually an incremental process since funds are limited and a project must pass through multiple phases of activity, spaced over several years. According to TDOT's 2005 LRTP, Tennessee's transportation needs over the 25 years will amount to nearly $130 billion (adjusted for inflation) while the available Federal, State, and local funds are estimated at $69 billion. A similar shortfall is predicted in Georgia's 2005 STIP: "Total revenues (2006-2035) are forecast to be $86 billion for the thirty year period, compared to total costs in the Build/Financially Unconstrained scenario of $160 billion."

Large projects are often subdivided into smaller, more manageable sections which can be staggered over several years. Adequate funding may be available to advance one or two SIUs even if funding is not available for the entire corridor.

Programming is also an iterative process as more information becomes available through each phase and decisions are refined and reevaluated. New information about the project description, scope, funding needs, and constructability issues can lead decisionmakers to reevaluate their support for a project.

The first phase, and often the only initial funding commitment, is the Planning phase. Programming for further project development may depend on the outcome of the Planning phase.

Given State funding cycles, it is estimated that it could take at least 1 year to build upon planning-level findings to develop the project justification, identify a source of funds for at least the initial phase of project development, and formally adopt the project into the DOT work program.

6.4 Preliminary Engineering and Environmental Analysis

Once authorized for Federal funds, the Preliminary Engineering and Environmental Analysis phase can begin. State funds may be authorized for early studies and/or preliminary engineering if it is deemed necessary to expedite the project schedule. However, if Federal funds are used for any phase of the project, the project is considered federally funded and full analysis is necessary to satisfy Federal requirements.

This phase of a project is conducted in accordance with the requirements of the NEPA of 1969 and other subsequent Federal environmental laws, regulations, and guidelines. The project development procedures used during this phase are usually referred to as the NEPA process. This phase of the project development process typically adds more specificity and technical detail to analyses conducted during the Scoping and Planning phases. Streamlining to link planning and environmental analysis phases reduces duplication of efforts and can expedite a project timeline, as discussed in **Section 6.4.e**.

Typically, this phase would be expected to take at least 2 years and probably more, especially if any major issues or significant impacts are identified. According to FHWA research for EISs completed during 1999 to 2010, an average of 74 months was required to complete the NEPA process. Based on data from a limited number of projects completed under SAFETEA-LU legislation, the average schedule for completing the NEPA process under SAFETEA-LU has been reduced to 3.4 years.

a. Preliminary Engineering

Preliminary Engineering includes preparation of conceptual designs, engineering studies, preliminary design, and environmental studies. Preliminary engineering for major projects generally consists of further concept development to update

and expand any previous planning work. Some of the more important steps in this phase include:

- Public Participation – Public involvement, resource agency coordination, and consultation with local officials are undertaken as a vital part of concept development to solicit input on potential issues, impacts, and alternatives. This input is used to help define and evaluate proposed alternatives for the project.

- Needs/Deficiencies Analysis – Using the results of the initial Scoping and Planning tasks as a starting point, the project development process continues with more detailed and/or updated data collection and analyses to focus more specifically on systems/route needs and deficiencies. Input received through public participation and the results of the updated Needs/Deficiencies Analysis can help verify or result in modifications to the Purpose and Need. It can also be used to better identify current and future deficiencies and needs that exist along a study corridor, as well as potential engineering issues and operational impacts of a project.

- Purpose and Need – Before beginning the development of alternatives, the information gained from the Planning process, the Public Participation process, and the Needs/Deficiencies Analysis is evaluated to determine if modifications should be made to the Purpose and Need statement. The statement must clearly establish the problem that the proposed project will address, with supporting data and explanation. It should clearly identify the need for the project, discuss logical termini, and identify major engineering and operational issues.

- Alternatives Development – The Purpose and Need of the project is the framework for the initial development of potential alternatives within the study corridor. Typical sections and design criteria will be proposed for any Build alignments, which will be used to better define the project footprint for environmental studies and to develop updated, more accurate cost estimates for the remaining phases of the project (i.e., final design, right-of-way, utilities, and construction). Preliminary line and grade plans may be developed; this will include such tasks as surveys and mapping, soils surveys, property surveys, utility investigations and coordination, railroad coordination, traffic forecasts and analysis, identification of required permits, consideration of underground storage tanks and hazardous materials sites, and preliminary work on various design

elements, such as highway geometrics, pavement, drainage, hydraulics and structures, lighting, traffic control, and erosion control.

The Preliminary Engineering phase feeds the Environmental Analysis phase, often overlapping as alternatives are refined to reduce footprints or projected impacts.

b. Environmental Analysis

The environmental steps in this phase are used to identify and determine potential impacts on the human and natural environmental, community, and cultural resources, including impacts on aquatic and terrestrial wildlife habitats, streams, wetlands, historic and archeological features, homes, businesses, and other unique features of value in the study area. This will also ascertain potential social and economic impacts and identify any features of special concern, such as the existence of underground storage tanks and hazardous materials sites. Another major outcome of this process is a compilation of environmental mitigation strategies that can be used to offset any potential impacts that may occur from the alternatives.

Depending on the scale of the project and characteristics of its environmental setting, data collection requirements can impact project timelines. Surveys for wildlife and endangered species may be constrained by season. Consultation with resource agencies regarding impacts can require close coordination and time sensitive efforts; this would be particularly true for the 3rd Infantry Division Highway corridor due to the density of resources in north Georgia and Tennessee.

c. Alternatives Evaluation

Based on the previous data and analyses, an evaluation of each of the proposed alternatives is conducted. The first step is the development of the criteria to apply for this evaluation. One of the evaluation criteria should be a relative comparison of how well each alternative satisfies the Purpose and Need of the project. Other criteria would also be considered, such as environmental resources, socioeconomic and community impacts, safety, travel benefits, engineering feasibility, project costs, public concerns, and others as determined by the project team. Using the selected criteria, the evaluation would include a comparison of the Build alternatives versus the No Build alternative, as well as comparisons among the various Build alternatives.

Based on this evaluation, a recommendation would be made regarding whether to choose the Build or No Build alternative and, if the former, the preferred Build alternative that should be carried forward for further project development.

d. NEPA Documents

Ultimately, this phase of project development results in an environmental document that is submitted for review and approval by FHWA. Three levels of NEPA documentation exist: Categorical Exclusion (CE) for projects with no significant impacts, Environmental Impact Statement (EIS) for projects with significant impacts, and Environmental Assessment (EA) for projects that may or may not result in significant impacts. Given the scope of the proposed improvements to the corridor and the controversy that surrounds the 3rd Infantry Division Highway corridor, it is anticipated that a formal EIS will be required if any projects are identified and advanced to this stage.

A Tiered EIS may be well suited to address NEPA issues at the full-corridor level and smaller SIUs for the 3rd Infantry Division corridor. In this process, a first tier EIS focuses on broad issues, e.g., general location, mode choice, and region-wide impacts related to major alternative concepts. In the second tier, site-specific details are examined for each SIU. This two-tier strategy facilitates resolution of big picture decisions early on so later studies can focus on relevant details. The Tiered EIS also follows the NEPA process to involve environmental, regulatory and resource agencies, and the public in making decisions, as well as consideration of environmental resources and potential impacts in these planning-level decisions.

Once an EIS is prepared and approved by FHWA, its availability for agency and public comment will be announced in the *Federal Register*. The Draft EIS is circulated to Federal, State, and local resource agencies and made available to the public for review. The agencies and public are given an opportunity to provide written comments on the EIS. A public hearing is held so that citizens, officials and agencies can also provide comments for the record in person.

At the end of the comment period, all written comments and comments received at the public hearing are summarized and addressed. A Final EIS would then be developed and its availability would be announced in the *Federal Register*. After 30 days, a Record of Decision is prepared, signed by FHWA and an announcement is placed in the *Federal Register*.

e. Planning and Environmental Linkage

One of the means for reducing some of the time for project development is to streamline the environmental process. If efforts are made during the Planning or Preliminary Engineering phase to follow the principles of the NEPA process, some planning-level analyses and decisions can be adopted and incorporated into subsequent phases of project development, thus reducing the time needed for the

environmental studies, alternatives development and evaluation, and environmental documentation.

Planning and Environmental Linkages represent a more efficient approach to transportation decisionmaking and the project development process. Considering community and agency perspectives, environmental issues, and other goals earlier in the Planning phase facilitates a smooth transition to future project development stages. By anticipating and addressing a range of environmental issues earlier in the process, designers can develop context-sensitive alternatives and minimize time-consuming redesigns in the future.

If planning-level tasks meet FHWA requirements regarding agency coordination, public involvement, and documentation, results from these efforts can be adopted into the NEPA process for

- The foundation for Purpose and Need statements;
- Definition of the general travel corridor;
- Preliminary screening of alternatives and elimination of unreasonable alternatives;
- Planning-level evaluation of indirect and cumulative effects;
- Regional or ecosystem-level mitigation options and priorities; and
- Linkage with housing, development, economic, and environmental goals and analysis.

Early consultation with resource agencies and other stakeholders during the Planning phase can help identify key environmental factors and resources, leading to informed decisionmaking and more focused analysis during NEPA phases.

Although specific implementation strategies to link planning and NEPA are still under development, applying this concept could eliminate the need to pursue a Tiered EIS and could help streamline the project development timeline.

6.5 Final Design

Final Design includes all of the work needed for the preparation of construction bid documents, including plans, specifications, and estimates (PS&E). This will include final plans, design/construction specifications, and estimates of quantities for roadway design, which includes roadway geometry, drainage, staging plans, erosion control, signs and markings, and signals. This also includes plans and specifications for structures, right-of-way acquisition, utility relocation, pavement design, lighting, and landscaping.

Obtaining permits from regulatory agencies is another component of the final design stage. Although specific requirements vary by location and project type, permits would likely be required from following agencies for each SIU.

- The U.S. Coast Guard, under the 1946 *General Bridge Act*, issues bridge permits requiring specific clearances for structures over navigable waterways.
- The U.S. Army Corps of Engineers issues permits under Sections 9 and 10 of the 1899 *Rivers and Harbors Act* and Section 404 of the *Clean Water Act* for construction activities in navigable waterways and wetlands. These permits regulate construction activities for placement/removal of structures over streams, dredge/fill earthwork, and other stream disturbances.
- The State Environmental Agency (TN Department of Environment and Conservation or GA Department of Natural Resources) provides Section 401 Water Quality Certifications for in-stream construction activities. This agency also typically oversees National Pollutant Discharge Elimination permits for surface runoff.
- The TN Valley Authority (TVA) provides permits for construction across or along the Tennessee River and its tributaries under the 1933 TVA Act.
- The Federal Aviation Administration issues permits for vertical obstructions (e.g. cranes or other equipment) located near airports.
- The National Resource Conservation Service issues approval for projects converting farmlands to non-agricultural uses under the *Farmland Protection Act.*

In addition, agency coordination and specific documentation requirements may apply if a project impacts threatened/endangered species, parks or recreational sites, historic/archaeological resources, lands developed under the Land and Water Conservation Fund Act, hazardous waste sites, State or federally managed lands, or coastal management zones.

At this conceptual level of detail, with no specific improvements defined, it is premature to try to identify the number of specific permits that will be required along the entire corridor. As most SIUs will likely require most of the permits listed above, this represents a relatively significant level of effort.

Other key elements are incorporating environmental mitigation into the final design, developing construction cost estimates, acquiring necessary easements, and the execution of appropriate agreements with the utilities and railroads.

Once the Final Design right-of-way plans are approved, the State DOT can seek Federal authorization of construction funds.

The Final Design phase for a project can take up to 2 years, and it can take longer if difficulties arise or approval is not given, which may require additional engineering studies, surveys, and/or plan revisions. The time required to obtain permits varies by project type and complexity.

6.6 Right-of-Way Acquisition

On approval of the NEPA document for the project, right-of-way acquisition can begin. The right-of-way acquisition process culminates with the actual acquiring of properties necessary for the planned and approved project. The process to determine the approved alignment for a project involves public hearings and consideration of the input gathered during these hearings and during the environmental decisionmaking process.

The acquisition of real property and the relocation of persons displaced by federally funded transportation projects must follow all requirements of the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (the Uniform Act, Public Law 91-646). The Uniform Act is codified at 42 USC 4601, and implementing regulations can be found at 49 CFR 24. As agreement is reached, deeds are prepared and parcels can be purchased. This phase addresses displacements and relocations, where necessary. Special efforts are also made to address any other negotiated or legal requirements, such as access improvements or removal of underground storage tanks, as well as the acquisition of easements and any necessary demolition and removal.

The Right-of-Way phase typically takes approximately 1 year for each project, depending on the scope of the project and the number of properties affected. However, it could take longer if a successful negotiation cannot be reached with a property owner, which would require continued negotiations or legal condemnation action, or if any unusual difficulties arise with the deed or with demolition and removal.

Before the project can be advertised for construction, a Right-of-Way Clearance Certification must be approved to certify that right-of-way was acquired in accordance with applicable FHWA directives, or that acquisition of right-of-way is not required.

6.7 Utilities Relocation

Once the Final Design utility relocation plans are approved and authorization has been granted to proceed to construction, the DOT can initiate physical relocation of any utilities that will be disturbed by the project. Again, if funds have not already been programmed, funds must be identified for the Utilities phase and incorporated into the DOT work program before this work can begin.

Any necessary right-of-way or easements must be obtained prior to the beginning of the Utilities phase. Coordination with the utility companies will have taken place throughout previous phases, and the plans would have been submitted to the utilities for review before Final Design was complete. At this point, field surveys are completed and discussions with the utilities continue to resolve any issues, update the plans as needed, and enter into formal agreements for the initiation of and reimbursement for the relocation work. Once all of these necessary steps are taken, the physical relocation of the work is accomplished.

Although railroads are not technically a utility, a similar process would also apply to any project impacts on railroad facilities within the project area.

The Utilities phase typically takes approximately 1 year, but it could take longer, depending on the circumstances and laws in effect for each State. It is possible that work could be accomplished simultaneously with the Right-of-Way phase if the utility right-of-way and easements are acquired early.

6.8 Construction

Once Construction Authorization has been given and both the Right-of-Way and Utilities phases are complete, the DOT can proceed with the Construction phase.

The Final PS&E are used for the letting and award process for the construction contract. The Construction phase includes construction engineering, materials testing, construction inspection, and other work directly related to the administration of the construction contract.

For a typical project, this phase can be expected to take up to 2 years, but it could take longer, depending on the scope and complexity of the project. Seasonal factors and weather events can impact construction timelines as well.

a. Maintenance of Traffic

Maintaining vehicle access to existing roadways and adjacent properties is a consideration throughout the construction process. One of the key elements that must be addressed before construction begins is developing a plan for the reasonable accommodation of existing traffic directly affected by the project. Of special importance, the requirement for the maintenance of traffic during construction can have a major impact on the construction schedule.

Under Federal regulations, work zone safety and mobility measures are required during the construction of Federal-aid highway projects. This requires the development of a *Traffic Management Plan* as part of the Final Design Phase. For major projects, the Plan includes development of a temporary traffic control

plan, a traffic operations component, and a public information component, which is likely to apply if any improvements are identified for implementation along the 3rd Infantry Division Highway corridor.

Maintenance of traffic could include such things as signing, channelization, alternate routes, night work, or other hourly or daily restrictions, as well as innovative measures to accelerate or minimize the impacts of construction. Public information techniques using local media or intelligent transportation systems raise public awareness or provide information directly to motorists. In some cases, particularly in major urban areas, the *Traffic Management Plan* must address potential system-wide impacts. While beyond the scope for a typical project, the Plan could also include demand management options, such as the promotion of transit use, carpooling, or flexible working hours, which are perhaps more applicable in major urban areas.

6.9 Schedule

As noted previously, if improvements along the 3rd Infantry Division Highway corridor are identified for implementation, it will not be practical or possible to undertake all of the improvements along the entire corridor at the same time. Also, finding and programming the necessary funds for full implementation of numerous SIU improvements within a large corridor would be a major challenge especially in light of the current economic climate.

As part of the *Every Day Counts* initiative, project delivery timelines are being shortened through enhanced technical support. Assuming a best case scenario whereby all of the funds could be programmed and all of the improvements undertaken simultaneously, the corridor improvements could take at least 12-13 years for full implementation, if no major issues arise to delay the project. Delivery of larger, more complex projects may take longer due to the magnitude and technical issues associated with a project, due to the number of Federal and State regulations they must comply with, and due to the public interest they generate.

As a comparison, a selection of Interstate and major corridor projects below required decades to advance through the project development stages to construction; several are still under development today. While numerous environmental policies and surface transportation authorizations have altered the project development process over the past decades, these examples provide a general illustration of timelines for major corridor projects.

- The construction of 76 miles of I-68 through the Appalachian region in Maryland began in 1963 and was completed in 1991.

- The I-75 through Tennessee was divided into 11 sections which completed constructed between 1963 and 1974.
- The 156-mile Savannah River Parkway (a four-lane arterial from Savannah to Augusta) was initially identified in the 1989 Georgia *Governor's Road Improvement Program* and completed construction in 2010.
- The Appalachian Development Highway System began with the Appalachian Development Act in 1965, which identified over 3,000 miles of highways for construction in 13 States. Over the next 45 years, 2,715 miles have been constructed (88 percent of the total system) and the remaining corridor segments are in planning, design, or right-of-way phases. Within the 3rd Infantry Division Highway study area, portions of Corridors A, K, and W have not yet been completed.
- The I-69 corridor, first envisioned in the 1950s, was first included as Corridor 18 in ISTEA in 1991. The corridor stretches through eight States to create a Canada-to-Mexico Interstate link on new and existing alignments. The corridor exists from Port Huron, MI to Indianapolis, IN. The over 1,600 mile corridor has been divided into 32 SIU which are still progressing through planning and NEPA stages at this time. A 22-mile section of the route in Mississippi opened to traffic in 2006; a few other SIUs are in the construction phase.

Given today's climate of budget constraints, the ability to fund, program, develop, and construct a series of improvement projects in the corridor would likely require many years or decades for full implementation.

7.0 STAKEHOLDER FEEDBACK

At the outset of the study, a public involvement strategy was developed to (1) enhance trust and promote lasting relationships with businesses, residents, agencies, government officials, and other stakeholders; (2) enhance awareness and understanding of the study to enable informed involvement and meaningful participation; and (3) be accountable, open, and flexible.

Because of the conceptual nature of the study and large geographic area concerned, a project Web site was the primary venue for public involvement. The purpose of the Web site was to offer public information about the study and to provide an avenue for public input. The Web site provided links to Expert Working Group materials, fact sheets, maps, technical reports, and frequently asked questions.

The Web site (*www.fhwa.dot.gov/planning/section_1927/3rd_infantry_highway*) also provides a project-specific form that users can complete to submit comments, questions, and concerns electronically. Although 15 messages have been received in support of a project, the vast majority of comments oppose further development of any corridor. As of June 15, 2011, 229

comments have been received. Major themes of public comments received are summarized below.

- Construction of a new highway or Interstate would lead to devastating impacts to the natural environment, including impacts to National Forests, wildlife habitats, mountains, scenic beauty and more.
- Construction of a new highway or Interstate would compromise quality of life for residents. The rural character and scenic beauty of the region are essential qualities that attract residents and tourists.
- No purpose or need has been demonstrated for the project.
- Costs for a project far outweigh benefits and should be considered in light of current transportation financing shortfalls. Funding for the project should end with the completion of this Phase I report.
- The project could represent improved mobility, an alternate route when landslides close existing roadways, economic development for depressed areas in north Georgia, and safer routes through the southern Appalachian Mountains.
- There is concern that the route would be used to transport nuclear waste materials.

7.1 Alternatives Suggested by Stakeholders

Through the Web site comment form, members of the public suggested several alternatives for consideration, as shown in **Figure 14**. The No Build (signing only) option discussed previously was affirmed by several persons as a less costly and less environmentally damaging alternative.

A route through South Carolina, parallel to the Savannah River, between I-95 at Savannah and I-85 at Greenville was suggested (shown as Public-1). This alternative would lead to impacts within Sumter National Forest and at the Savannah River Plant nuclear facility. It faces the same challenges as Corridor D: missing the Augusta and Knoxville Control Points and travelling through mountainous terrain if continued northward. For these reasons, this alternative was not recommended for further study.

A route northwest from I-85 at Lavonia to I-75 at Cleveland, TN was also suggested through the Web site (shown as Public-2). The corridor would pass through the north Georgia towns of Cleveland, Blairsville, and McKaysville before following the proposed Corridor K route in Tennessee. This alternative would lead to impacts within the Chattahoochee and Cherokee National Forests and would pass through or adjacent to several federally designated Wilderness Areas. It would also cross through mountainous terrain and areas in Georgia designated as Protected Mountains. For these reasons, this alternative was not recommended for further study.

THIRD INFANTRY DIVISION HIGHWAY CORRIDOR STUDY

Figure 14
Corridors Suggested by Public

A route northwest from Augusta to I-75 at Dalton was suggested (shown as Public-3). This corridor was developed to pair with the southern portion of the Public-1 Corridor described above. This link closely parallels Corridor A West (with a spur at Dalton) north of Augusta and would result in similar impacts.

A route from Savannah to Augusta to Greenville then following a widened I-40 to Knoxville was suggested (shown as Public-4). This corridor crosses through the National Forests and follows the eastern boundary of the GRSM National Park, crossing through the same mountainous topography as Alternatives C and D. Members of the EWG identified existing routes through Asheville, NC as congested and recommended alternatives avoid this area. The proposed corridor does not intersect the Lavonia Control Point. For these reasons, it is not recommended for further study.

Other suggestions recommended pursuing high-speed commuter rail or reallocating funds to support military, education, public health, debt reduction, disaster relief, or other programs.

7.2 Public Meetings

Letters were received from three organizations to request that FHWA host public meetings along the proposed corridors to provide an opportunity for residents to ask questions and provide feedback. Because of the vast geographical area covered by the study, its conceptual nature, and costs associated with in-person meetings, the project team opted to host Web-based meeting sessions instead. Three online question and answer sessions were hosted during May 17 and 18, 2011. Each Webinar featured a brief presentation about the study process, followed by an opportunity for participants to ask questions of the project team. A total of 50 participants attended the three events.

If transportation decisionmakers opt to advance the 3rd Infantry Division Highway for further project development, a robust public involvement process will be necessary. Comments received throughout this phase of work show a large number of regional residents and stakeholders have strong opinions about the corridor. To provide adequate venues to reach a diverse population spread over a large geographic region, the following efforts are recommended for any future public involvement efforts:

- Formation of a project advisory committee, made up of a limited number of area residents representing a broad cross section of perspectives: economic development, environmental preservation and conservation, historic interests, emergency services, etc.
- Continuation of the study Web site, to inform interested parties about study/project milestones and to provide a venue for feedback

- Coordination with media representatives throughout the project area to ensure accurate, up-to-date information is available to a wide audience and consistent with key project messages
- In-person public meetings and hearings, held in various locations in the study area at project/study milestones, to solicit information from interested parties and provide an opportunity for attendees to view materials and ask questions

8.0 CONCLUSIONS

A new or improved corridor between Savannah, Augusta, and Knoxville has not been identified in any State DOT or MPO long-range plan. All State DOTs and MPOs have established intensive long-range transportation processes; these processes assess current and future needs for different transportation modes and prioritize these needs in light of financial constraints. Extensive public involvement techniques are employed to engage citizens in defining policies and projects which will shape the statewide transportation network over the next 20-30 year planning horizon.

A new highway corridor from Savannah to Knoxville would result in significant costs, both financial and environmental. Construction of a new highway or Interstate route between Savannah, Augusta, and Knoxville is estimated to cost $560 million to $5.9 billion, depending on the route selected and design level. Signing an existing route would cost significantly less. The Southern Appalachian region contains a dense mixture of small mountain communities, sensitive environmental resources, and federally managed lands.

Analysis suggests corridors located farther west face fewer environmental and terrain challenges than corridors located in the center or eastern portions of the Study Area. However, significant resources impacts are likely to result from any alternative.

The majority of public comments expressed opposition to this corridor concept and to other new highways proposed in the region. Members of the public and the EWG have repeatedly expressed concern that there is no purpose for the 3rd Infantry Division highway corridor between Savannah, Augusta, and Knoxville. Limited support for the corridor concept is built upon improved economic development and safety.

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