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I-55 Interchange Draft EIS

Draft Environmental Impact Statement for Interstate 55 Interchange at E.H. Crump Boulevard and South Riverside Boulevard in Memphis, Shelby County, Tennessee

Submitted Pursuant To 42 U.S.C. 4332 (2)(c) by the U.S. Department of Transportation, Federal Highway Administration and Tennessee Department of Transportation, Environmental Division

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INTERSTATE 55 INTERCHANGE AT E.H. CRUMP BOULEVARD AND SOUTH RIVERSIDE BOULEVARD

Memphis, Shelby County, Tennessee

Draft Environmental Impact Statement

Submitted Pursuant to the National Environmental Policy Act of 1969
42 U.S.C. 4332 (2)(c)
by
U.S. Department of Transportation, Federal Highway Administration and
Tennessee Department of Transportation, Environmental Division

3/25/09
Date

Federal Highway Administration

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Date

Tennessee Department of Transportation

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Comments on this Draft Environmental Impact Statement are due by June 30, 2009 and should be sent to Ms. Suzanne B. Herron at the address shown above.

EXECUTIVE SUMMARY and LIST of ENVIRONMENTAL COMMITMENTS

ES.0 EXECUTIVE SUMMARY

ES.1 General Project Description

The Tennessee Department of Transportation (TDOT) proposes to improve the I-55 Interchange at E.H. Crump Boulevard (State Route 15/U.S. 64) and South Riverside Boulevard, henceforth I-55 Interchange, within the western edge of the City of Memphis in Shelby County, Tennessee. Interstate 55 is one of the major north-south transit corridors of the United States. The I-55 Interchange is utilized by high volumes of everyday, local commuters and through-traffic, including an abundance of commercial truck traffic. The current outdated configuration of the I-55 Interchange poses multiple safety and efficiency problems. The proposed project would involve reconfiguring the cloverleaf design of the existing I-55 Interchange into a configuration that reduces crashes, relieves congestion, and provides route continuity of I-55 by eliminating the need for mainline I-55 traffic to utilize single-lane, low-speed ramps.

The project limits begin at the east termination of the I-55 Mississippi River Bridge in Memphis and extend southward along I-55 to near Wisconsin Avenue. The project study area generally consists of a 500-foot corridor along the existing footprint of I-55 from the Mississippi River Bridge extending south to McClemore Avenue. The entire footprint of the existing I-55 Interchange with E.H. Crump Boulevard and South Riverside Boulevard is included in the study area. The study area extends along approximately 1.5 miles of the existing I-55 alignment. No other major actions planned by other government agencies are known to be located in the same area as the I-55 Interchange project at this time.

ES.2 Need for the Project

Interstate 55, in the vicinity of the E.H. Crump Boulevard and South Riverside Boulevard Interchange, was constructed in the mid 1960's with a geometric design that does not meet current Federal or State standards. The existing I-55 is a four-lane median-divided highway with one auxiliary lane in both directions. Numerous weave areas are located within the subject area, as well as substandard acceleration and deceleration lengths for most ramp junctions. The existing I-55 Interchange is a full cloverleaf design with loop ramps in all four quadrants. All exiting and entering traffic from these loops are required to make weaving maneuvers. The posted speed limit for these ramps is 25 miles per hour (mph), but average speeds through portions of the interchange typically range from 5 to 10 mph.

This project is listed in the current Memphis Urban Area Metropolitan Planning Organization (MPO) 2030 Long Range Transportation Plan (LRTP Project ID = 60030002). The project was included in the previous the 2004-2006 Transportation Improvement Program (TIP), but was not listed in the most recent 2008-2011 TIP since the project had not moved beyond the NEPA phase and it was not known if construction would commence by 2011. If a Build Alternative is selected and carried forward to the right-of-way acquisition and construction phases, it would be included in the TIP.

Traffic analysis has indicated that the existing interchange is inadequate to handle current and design year traffic volumes. For Year 2012, traffic volumes are estimated at 60,870 Annual Average Daily Traffic (AADT), and for Year 2032 they are estimated to be 85,220 AADT. The existing cloverleaf configuration, the close proximity of adjacent interchanges, and the associated weave and merge problems severely congest the area and result in safety issues.

The crash history for the area shows that a high number of collisions may be directly attributable to a combination of the existing interchange configuration and heavy traffic volumes. Those two factors

result in frequent traffic congestion. This congestion, primarily caused by I-55 traffic being required to use the cloverleaf ramps to pass through the area, results in an abundance of rear-end and side-swipe type crashes. Most of the crashes in the project area are rear-end accidents that occur on I-55 along the roadway segments approaching the weave and ramp areas where traffic tends to back up most frequently.

Traffic studies indicated that if one of the proposed Build Alternatives were implemented to make the main lanes of I-55 continuous and reduce the number of weave movements by not forcing traffic to use the existing cloverleaf interchange, the overall capacity, safety, and efficiency of the interchange would improve. The Build Alternatives would include flyover bridges for the main lanes of I-55 configured with a design speed of 50 mph.

To summarize, improving the I-55 Interchange would provide a logical freeway facility that connects portions of I-55 located west/north of Memphis to portions of I-55 located south of Memphis. The proposed project has logical termini and independent utility. The proposed interchange would reduce congestion, reduce crashes, restore interstate route continuity, and would not restrict consideration of alternatives of other reasonably foreseeable transportation improvements.

ES.3 Purpose of the Project

The purpose of the proposed project is to provide a balanced solution for safety and capacity issues at the I-55 Interchange. Benefits and core objectives of the interchange improvement project include reduced congestion, reduced number of crashes, and restored north and south mainline interstate route continuity. Restored route continuity would serve national security and national defense objectives while providing economic benefits by improving north- and south-bound freight transport.

Ultimately, the final design of the new interchange will be a result of continued coordination and cooperation with various agencies, organizations, and other stakeholders for the project. The overall goal of the new I-55 Interchange would be to provide a facility that would adequately serve the future transportation needs of the area while minimizing adverse human and environmental impacts to the extent practical by implementing impact avoidance, minimization, and/or mitigation efforts.

ES.4 Project Alternatives Evaluated in the Environmental Impact Statement

Two Build Alternatives have been identified as reasonable alternatives to be considered in the I-55 Interchange Environmental Impact Statement (EIS). The No-Build Alternative is included in the study as a tool for comparison of the potential impacts of the Build Alternatives. Several other alternatives, including various design configurations, enhancement of the public transportation system, and/or implementation of Transportation System Management (TSM) techniques, were also considered as potential alternatives for this project, but were later eliminated from further consideration because they did not meet the criteria to be considered reasonable alternatives. Further discussion concerning the elimination of certain alternatives can be found in Chapter 2 of this EIS.

Screening criteria used to determine which alternatives to pursue included the following:

- The alternative must meet the general project Purpose and Need including providing a balanced solution for safety and capacity issues at the I-55 Interchange;
- The alternative must seek to avoid or minimize impacts to the social, economic, natural, and cultural resources within the project vicinity;
- Build alternatives must be reasonable and feasible to construct; and

- The alternative must meet design standards as defined in "A Policy on Design Standards – Interstate System, 5th Edition" and American Association of State Highway and Transportation Officials (AASHTO) "A Policy on Geometric Design of Highways and Streets" which outlines the criteria for urban freeways in Chapter 8 by stating, "… design speed should not be less than 80 km/hr (50 mph)." This design guide notes, "… higher design speeds are closely related to the overall quality and safety of a facility."

No-Build Alternative

The No-Build Alternative, as implied, normally denotes that only minor changes, such as minor safety enhancements and routine maintenance, would be made to the existing interchange. No improvements or substantial alterations would be made to the existing interchange configuration, and no new structures would be added to the existing infrastructure.

The existing interchange operates at unacceptably poor Levels of Service (LOS). The weave areas associated with the existing cloverleaf places very high volumes of through-traffic on I-55 onto single-lane ramps resulting in LOS F, the worst possible level. These form queues of traffic and impede traffic flow upstream for north and southbound traffic. The problem is especially severe for northbound traffic, which regularly queues through the McLemore Interchange and through the South Parkway Interchange. These long queues have been a problem for many years, and they are a source of extensive travel delays. These traffic capacity concerns would continue under the No Build Alternative.

Other non-related development projects, some of which could result in additional traffic volumes in the immediate project vicinity are likely to occur regardless of the I-55 Interchange Improvements resulting in additional traffic congestion and safety issues. The No Build Alternative provides the basis for comparing potential impacts associated with the proposed Build Alternatives.

Build Alternatives

Two Build Alternatives were identified that would be capable of fulfilling the purpose and need for this project. The two proposed Build Alternatives, Alternative A and Alternative B, utilize the same general design with variations in the arrangement of exits and secondary roads. Each of the Build Alternatives would include construction of flyover bridges for the main lanes of I-55 allowing mainline I-55 traffic to pass through the interchange freely. The flyover bridges of I-55 under either Build Alternative would be configured with a design speed of 50 mph. Traffic operations would be improved by implementation of either Alternative A or Alternative B with all movements operating at a more desirable LOS in the design year than would occur with the No-Build Alternative.

Alternative A

Alternative A consists of proposed modifications to the I-55 Interchange that would improve traffic movements along and between the I-55 and McLemore Interchange and the Mississippi River Bridge. The layout of Alternative A is shown on Figure 2.2 and Figure 2.3 in the main body of this document. The proposed improvements would provide I-55 traffic with continuous free-flow mainline movements by eliminating the need to utilize one-lane exit/entrance ramps to remain on the interstate. The existing loop ramp in the southwest quadrant would be removed, thus improving safety by eliminating the associated weave movement in this area. Existing infrastructure would be utilized where feasible, and all efforts would be made to maintain driver expectancy throughout the corridor. This alternative would require the construction of three new structures, construction of substantial retaining walls, relocation of approximately eight residences and two businesses, and elimination of the existing ramps to the nearby Metal Museum. The design speed for Alternative A is 50 mph. Specific changes associated with Alternative A include:

- Northbound I-55 traffic wishing to remain on I-55 would utilize two inside travel lanes. Northbound I-55 traffic wishing to access the central Memphis business district would use South Riverside Boulevard via an outside auxiliary lane. In order to provide access to E.H. Crump Boulevard from Northbound I-55, minor changes would be made to the existing ramp. Northbound I-55 motorists would be able to access the Metal Museum by exiting onto E.H. Crump Boulevard and turning left onto Illinois Avenue.
- Southbound I-55 traffic from the Mississippi River Bridge wishing to remain on I-55 would utilize two inside travel lanes. Southbound I-55 traffic wishing to access E.H. Crump Boulevard would utilize a proposed exit ramp to a new connector at Illinois Avenue. Flow from the exit ramp to the new connector would be controlled by a traffic light. It is important to note that this design constitutes a partial interchange, which is discouraged by the AASHTO design standards for interstate systems. The traffic light at Illinois Avenue has the potential to create unsafe conditions by backing vehicles onto I-55 during abnormal traffic flow periods. The configuration of this ramp also has the potential to create dangerous wrong-way encroachments, whereby errant drivers may turn onto the ramp from the local street and travel the wrong direction onto the interstate mainline.
- Traffic from westbound E.H. Crump Boulevard to northbound I-55 would utilize a tapered ramp in the vicinity of the former Metal Museum exit. Westbound traffic from E.H. Crump Boulevard to southbound I-55 would utilize the existing northwest loop ramp to access an auxiliary ramp. This auxiliary ramp would merge traffic from E.H. Crump Boulevard with traffic from South Riverside Boulevard prior to merging with southbound I-55. Traffic from westbound E.H. Crump Boulevard to northbound South Riverside Boulevard would utilize the existing ramp that joins South Riverside Boulevard just south of the CSX railroad overpass.
- Southbound South Riverside Boulevard traffic would utilize the existing ramp to access westbound I-55 into Arkansas and would yield before merging with mainline interstate traffic. Southbound traffic from South Riverside Boulevard to southbound I-55 would utilize a proposed ramp beneath the four-lane mainline structure. This ramp would also serve as an auxiliary lane to the McLemore Avenue interchange. A new connector road would provide access to the southern residential community from South Riverside Boulevard. Through traffic on South Riverside Boulevard would be continuous through the proposed intersection via connector roads and would never have to enter the interstate system.

Alternative B

Alternative B maintains the basic design as Alternative A, but it incorporates modifications to address concerns over continuity for southbound I-55 motorists wishing to access E.H. Crump Boulevard immediately after crossing the Mississippi River. The layout of Alternative B is shown on Figure 2.4 and Figure 2.5 in the main body of this document. Southbound I-55 motorists would be provided continuous access to E.H. Crump Boulevard via an outside auxiliary road that would cross under the four-lane mainline structure. The two signalized intersections on Illinois Avenue proposed in Alternative A would be eliminated.

Unlike Alternative A, this option does not include direct access to the residential and commercial properties on Illinois Avenue from I-55. However, it does provide the southwest quadrant with direct access to eastbound E.H. Crump Boulevard via an added lane that connects to the outside auxiliary lane from southbound I-55. Vehicles traveling westbound on E.H. Crump Boulevard would be able to utilize the existing ramp to access Metal Museum Drive. Motorist traveling north on I-55 would have to exit at E.H. Crump Boulevard and use the northeast loop in order to access Metal Museum Drive. Southbound Riverside Boulevard does not have access to eastbound E.H. Crump Boulevard.

This design would require relocation of nine residences and one business. Unlike Alternative A, this alternative maintains the continuity of E.H. Crump Boulevard by eliminating two at-grade intersections. It also provides a more direct access to E.H. Crump Boulevard and South Riverside Boulevard.

Alternatives Previously Considered and Eliminated from Further Consideration

Other potential alternatives were considered for this project, but were eliminated from further consideration due either to design limitations, which would have resulted in reduced design speeds and lower levels of service (LOS), or due to the severe economic impacts they would have incurred. Some of the eliminated alternatives would not have met the stated Purpose and Need of the project due to the poor LOS they would have provided. The eliminated alternatives are described in more detail in Section 2.3 of this document.

ES.5 Summary of Environmental Consequences

Direct, indirect, and cumulative impacts anticipated to occur with implementation of this project are discussed in Chapter 3 of this document. Direct impacts were defined as those impacts that would occur due to construction of the project and would occur at the same time and location. Indirect impacts were studied based on reasonably foreseeable impacts that would occur as a result of the I-55 Interchange project, but would occur later in time or further removed in space from the project footprint. Cumulative impacts were analyzed by combining the likely impacts of the I-55 Interchange project with other past, present, and reasonably foreseeable projects or actions in the area. Cumulative impacts analyses including TDOT projects and all other non-related projects or actions that have occurred, or are planned in the reasonably foreseeable future that have impacted, are impacting, or are expected to impact the same resources as the I-55 Interchange project. The basic concepts discussed in the National Cooperative Highway Research Program (NCHRP) Report 466 "Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects" were used during the indirect impacts analyses. Table ES-1 located at the end of this section contains summary data for this project including basic design information, costs, and environmental consequences for each of the proposed Build Alternatives for this project. Table 3.22 located at the end of Chapter 3 contains a comparative summary of all environmental impacts anticipated under each alternative studied.

Land Use Impacts

All of the land within the general project area is urban. Several types of development and land usages are present, such as commercial, transportation, and residential uses. Commercial usage includes hotels, offices, warehouses, industrial, and manufacturing facilities. Transportation land uses include interstates, access ramps, sidewalks, maintained right-of-way (ROW), and grass medians. Residential land use includes neighborhoods composed of single-family residences and associated yards, sidewalks, driveways, and streets. Recreational land uses in the project vicinity include small parks and other open spaces. These land uses would not be expected to change substantially under the No-Build Alternative.

Construction of a new I-55 Interchange under either of the proposed Build Alternatives would result in long-term changes in land use for areas within the proposed ROW of the project that are not already being used for transportation purposes. This would primarily include converting a small area of residential and commercial land located immediately southwest of the current I-55 Interchange, including the northeast corner of the French Fort neighborhood. This will impact several parcels containing existing residences and businesses.

Social Impacts

Social impacts of the No-Build Alternative would primarily be due to traffic congestion and delayed travel times associated with the continued use of the outdated interchange. The traffic issues associated with the existing interchange would continue to result in potential safety issues due to crashes in the area as well as potential delays in response times for emergency vehicles needing to move through the area. Also, the traffic congestion may result in increased air quality problems compared to more free-flowing traffic conditions expected under the Build Alternatives. No residential or business displacements would be required under the No-Build Alternative.

The Build Alternatives would have potential for both adverse and beneficial impacts to the social environment. Due to the design configuration of the new interchange under either of the proposed Build Alternatives, several homes, and up to two businesses would be removed. This would result in displacement of several residents in the French Fort neighborhood. The Relocation Assistance Program will be utilized to ensure, to the maximum extent possible, the prompt and equitable relocation and reestablishment of persons and businesses displaced as a result of this project. The Relocation Assistance Program helps to ensure that displaced parties do not suffer disproportionate harm as a result of programs designed to benefit the public as a whole. The relocation of displaced households, businesses, and any other affected party will be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972, and the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646). Comparable replacement housing will be provided to all residential relocatees under the provisions of the above laws.

There would be Environmental Justice concerns associated with the displacements in the French Fort neighborhood because the French Fort neighborhood is a predominantly African-American community. Residents in this neighborhood would be directly impacted by implementation of the proposed project based on the layout of the Build Alternatives. Due to the nature of this project, no other reasonable alternatives have been identified that would successfully meet the purposed and need for this project that would not result in impacts to residents in the French Fort neighborhood.

To help mitigate impacts to the residents of the French Fort neighborhood and to help maintain neighborhood cohesion, TDOT has worked closely with the residents of the French Fort neighborhood and with the City of Memphis to have an area of vacant land currently owned by the City of Memphis in the vicinity of the French Fort neighborhood redesignated as residential property. If one of the Build Alternatives is implemented, this land will be made available to provide an option for displaced French Fort neighborhood residents to purchase and construct a replacement home. This option would allow displaced residents to remain part of the French Fort neighborhood should there not be enough existing replacement homes available (i.e., for sale) in the neighborhood or general vicinity for those residents to purchase. Displaced persons would be allowed to construct new residences on this vacant land if they choose that option.

Benefits of the Build Alternatives to the social environment would include improved traffic flow through the area, better access to and from portions of downtown Memphis, improved traffic safety, and better response times for emergency vehicles needing to pass through the I-55 Interchange area to respond to emergencies in the surrounding area.

Economic Impacts

The No-Build Alternative would not be expected to have measurable impacts to the local or regional economies compared to baseline conditions. However, continued increases in traffic congestion due to the outdated I-55 Interchange would result in increased travel times, higher operating expenses, and potential increased crash rates in the area, which could affect local commuters and businesses and other frequent users of the existing interchange. The continued traffic and access issues could also

make the general project area less attractive for new development associated with planned revitalization efforts, which may in turn impact property values and the overall economy in general.

Both short-term and long-term beneficial and adverse economic impacts will occur under the Build Alternatives. Short-term adverse impacts will occur due to a decrease in the real property tax base and real property tax revenues as a result of the residential and business displacements. Real property tax revenue would also be adversely impacted by the removal of small portions of additional properties from the tax rolls for ROW acquisition. Additional tax revenue losses could also occur due to losses of business-related taxes (e.g., sales, utility, inventory taxes, etc.). However, the tax revenue losses will likely only be temporary (i.e., limited to the construction phase of the project) if the displaced residents and businesses relocate within the project vicinity as anticipated. Other short-term adverse economic impacts would include relocation expenses and the temporary loss of business income during the relocation period.

Over the long term, the economic impacts of the improved interchange would be beneficial both locally and regionally. Travel benefits would include decreased travel times, lower operating expenses, and reduced crash rates for both local daily commuters and travelers passing through the area. The project would also result in better access to portions of Memphis providing benefits to existing businesses and/or future businesses whose customers utilize the I-55 Interchange area. Improved access to and from some properties or areas surrounding the new interchange may make those areas more attractive for residential, commercial, and/or industrial developments, resulting in potential increases in property values and other beneficial economic impacts for the local and regional economies. This would be especially true for strategically located parcels that would benefit directly from the improved access due to the new interchange configuration. Manufacturing and other companies that rely on I-55 to transport goods to and from the Memphis area would likely receive additional savings due to more efficient travel through the area, which would reduce delivery time and fuel consumption.

Cultural Resources Impacts

A total of three properties were identified in the area of potential effect (APE) that are listed on the National Register of Historic Places (NRHP): the Memphis-Arkansas Bridge, the U.S. Marine Hospital Executive Building and Laundry-Kitchen (including the expanded boundary), and the Chickasaw Heritage Park. One additional property, the W.T. Rawleigh/United Warehouse, was also considered eligible for listing in the NRHP. The Tennessee State Historic Preservation Office (SHPO) concurred with the findings and determined that "… the project as currently proposed will not adversely affect these resources."

One archaeological site (Site 40SY709) located within the proposed ROW of both of the Build Alternatives would be impacted during construction. Based on review of the archaeology studies, the SHPO determined that this site will be subject to Phase II testing to further define the nature of the site and to comply with Section 106 of the National Historic Preservation Act. Phase II testing will be conducted prior to issuance of the Final EIS for this project. TDOT will continue to coordinate with the SHPO and other consulting parties involved, to ensure that all Section 106 requirements are met prior to construction occurring and to ensure that proper mitigation efforts are in place to preserve any valuable archaeological data the site may offer.

Noise Impacts

Noise impacts for this project were evaluated in accordance with the FHWA Noise Assessment Guidelines. Based on the noise analysis conducted for this project, the No-Build Alternative would impact a total of 21 receptors, while Alternatives A and B would result in impacts to 39 and 37 receptors, respectively.

Based on preliminary evaluation, a noise barrier would be considered feasible and reasonable for each of the Build Alternatives and could be constructed to provide noise abatement for residents in the French Fort Neighborhood. The final decision on implementation of abatement measures will be made during the project design phase and after consideration of input from the public involvement process.

Trucks and machinery used for construction produce noise and vibration, which may affect some land uses and activities during the construction period. Individuals inhabiting homes along I-55 will at some time experience perceptible construction noise and vibration from the implementation of this project. Occupants of buildings within a radius of approximately 200 feet from very specific construction equipment may perceive ground vibration effects during the operation of that equipment. Although these effects are of a temporary nature, and will vary from day to day based on specific construction operations, even minor cosmetic damage is unlikely to occur to buildings situated beyond approximately 100 feet from the heaviest vibration generators. To minimize or eliminate the effects of construction noise on adjacent sensitive receptors, mitigation measures would be implemented in accordance with TDOT's *Standard Specifications for Road and Bridge Construction*.

Air Quality Impacts

FHWA and the Federal Transit Administration (FTA) have determined that the MPO's Long-Range Transportation Plan and Transportation Improvement Program, both of which included the I-55 Interchange project, conform to the transportation-related provisions of the Clean Air Act Amendments of 1990. These findings were in accordance with 40 CFR Part 93, "Criteria and Procedures for Determining Conformity to state or Federal Implementation Plans of Transportation Plans, Programs, and projects Funded or Approved Under title 23 USC or the Federal Transit Act."

If the No-Build Alternative were selected, it is anticipated that local air quality may be adversely impacted as LOS would continue to decline and traffic congestion would continue to increase. Increased emissions from vehicles forced to idle in the area would result in potential health risks for adjacent residents. However, the extent of those risks cannot be predicted at this time.

Under the Build Alternatives, this project is not expected to cause or contribute to any violation of the National Ambient Air Quality Standards (NAAQS). A microscale carbon monoxide hotspot analysis was conducted for this project. Carbon monoxide concentrations for both Build Alternatives are projected to be well below the NAAQS one-hour standard of 35.0 ppm. Since the highest projected one-hour concentration is lower than the eight-hour NAAQS of 9.0ppm, calculation of eight-hour concentrations were not required for this project.

A qualitative analysis of Mobile Source Air Toxics (MSAT) was conducted for this project. An increase in vehicles miles traveled (VMT) associated with the Build Alternatives would lead to higher MSAT emissions along the I-55 Corridor, along with a corresponding decrease in MSAT emissions along the adjacent routes or other routes used to bypass the congested portions of I-55. The additional travel lanes and proposed realignment contemplated as part of the Build Alternatives will have the effect of moving some traffic closer to nearby homes and businesses; therefore, there may be localized areas where ambient concentrations of MSATs could be higher than the No-Build Alternative. The emissions increase would be offset somewhat by lower MSAT emission rates due to increased speeds, because according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Regardless of the alternative chosen for this project, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these

national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the project area are likely to be lower in the future in nearly all cases.

No violations of the NAAQS are projected for this project. Therefore, no air quality mitigation measures are required for the project improvements. During construction, the contractor will comply with all federal, state, and local laws and regulations governing the control of air pollution. Adequate dust-control measures would be maintained so as not to cause detriment to the safety, health, welfare, or comfort of any person or cause any damage to any property or business.

Ecological Impacts

Because of lack of aquatic resources and because of the heavily developed and urban conditions within and adjacent to the proposed ROW and 500-foot study corridor, the I-55 Interchange project would have no substantial or long-term adverse effect on wetlands, streams, federally or state-listed threatened and endangered species and/or habitats, or any other natural resource. No direct impacts to public lands or unique natural areas would be anticipated with this project.

Minor, short-term indirect impacts to water quality for watercourses located outside of the study area could occur during the project construction phase due to stormwater runoff from the site. Runoff from the construction area could result in sedimentation in areas downstream of stormwater outlets that empty directly into streams. The potential for water quality impacts will be minimized through construction techniques that would help control erosion and runoff from the construction area.

Farmland Impacts

Farmland Impact Rating Forms (Form AD 1006) were sent to the Department of Agriculture, Natural Resources Conservation Service for their input. Less than 40 acres would be directly converted under Alternative A or Alternative B. Due to the urban uses established in the project area, it was determined that the project area did not contain prime, unique, statewide, or local important farmland.

Construction Impacts

Adverse impacts from construction would be primarily short-term in duration. Construction inconveniences such as noise, dust, and traffic conflicts are likely to be unavoidable yet are greatest during the construction phase only. In order to minimize potential detrimental effects from noise, siltation, soil erosion, or possible pollution of area watercourses, the construction contractors would be required to comply with the special provisions of Standard Specifications for Road and Bridge Construction (TDOT, 2006).

Contractors would be required to conduct and schedule operations according to these provisions. For example, the contractor would be bound by Section 107.01 of the Standard Specifications to observe any noise ordinance in effect within the project limits. Detoured traffic would be routed during construction in a manner that has the least noise impact practicable upon residential and noise sensitive areas. In addition, coordination with affected utility companies would minimize disruption to utility services. Furthermore, TDOT would coordinate with local governments during the construction phase to minimize disruption to communities accepting detoured traffic.

Any action involving open burning would be in accordance with Chapter 1200-3-4 (“Open Burning”) of the Tennessee Air Pollution Control Regulations. Any action resulting in fugitive dust would be in accordance with Chapter 1200-3-8 (“Fugitive Dust”).

Solid waste generated by construction activities would be disposed of in accordance with all state rules and regulations concerning solid waste management. Where possible, land debris would be disposed at a registered sanitary landfill site. If the use of a landfill is not possible, the contractor would dispose of the solid waste in a manner that is compliant with NEPA regulations.

Proper sediment control measures, such as silt fences, would be used as outlined in the Tennessee Erosion and Sediment Control Handbook (TDEC, 2001b) and Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites (Smoot et al., 1992).

Table ES-1. Summary of Project Data for the I-55 Interchange at E.H. Crump Boulevard and South Riverside Boulevard in Memphis, Shelby County, Tennessee.

Item	No-Build	Alternative A	Alternative B
Functional Classification	Interchange	Interchange	Interchange
System Class	Interstate Transportation System	Interstate Transportation System	Interstate Transportation System
Length - Miles	0.75	0.75	0.75
Cross-sections – Feet	110 feet	134 feet	134 feet
Year 2012 AADT	60,870	60,870	61,840
Year 2032 AADT	85,220	85,220	86,550
Percent Trucks (DHV)	27% (6,818)	27% (6,818)	27% (6,924)
Estimated Right-of-Way Acquisition – (Acres)	0	6.2	4.10
Residential Displacements	0	8	8
Business Displacements	0	2	1
Noise Receptors Impacted	24	39	37
Archaeological Sites Impacted	0	1	1
Historic Sites Impacted (number)	0	0	0
Section 4(f)/Section 6(f) Properties Impacted	0	0	0
Wetlands Impacted	0	0	0
Threatened and Endangered Species Impacted	0	0	0
Estimated Right-of-Way Cost	0	$3,140,000	$2,650,000
Estimated Utility Cost Reimbursable	0	0	0
Estimated Utility Cost Non-Reimbursable	0	$399,600	$209,250
Estimated Engineering/Construction Cost	0	$28,875,000	$28,710,000
Total Estimated Project Cost	0	$32,414,600	$31,569,250

Source: Tennessee Department of Transportation, 2009

ES.6 Required Permits

The acquisition of permits would occur prior to initiation of construction activities, pursuant to Section 69-3-108(a) of the Tennessee Water Quality Control Act of 1977 and other State and Federal laws and regulations. These permits could include:

- **Clean Water Act - Section 404 Permit** – required for construction that involves placement of dredge and fill material in Waters of the U.S. and/or impacts to Waters of the U.S. where federally-listed Threatened or Endangered species are present. Typical Waters of the U.S. include rivers, streams, headwaters streams, and special aquatic sites, such as wetlands. Section 404 Permits are issued by the U.S. Army Corps of Engineers (USACE).
- **Aquatic Resource Alteration Permit (ARAP)** – required for any alterations of State waters, including wetlands that do not require a Federal (Section 404) permit. The ARAP permits are required for construction at locations where the proposed project involves placement of fill in the following: a pond that is spring fed or impacts springs; reservoirs; wetlands; streams; intermittent streams; and any stream that supports any form of aquatic life; or is in the vicinity of a State-listed endangered species. Tennessee Department of Environment and Conservation (TDEC), Division of Water Pollution Control issues ARAP permits.
- **National Pollutant Discharge Elimination System (NPDES) Stormwater Construction Permit** – required for grubbing, clearing, grading, or excavation of one or more acres of land. TDEC's Division of Water Pollution Control issues NPDES permits.
- **Tennessee Construction General Permit for Storm Water Discharges from Construction Activities (TNCGP)** – required by operators of construction sites in Tennessee.

In addition, the State of Tennessee would require water quality certification under Section 401 of the CWA. Section 401 certification ensures that activities requiring a Federal permit or license will not cause pollution in violation of State water quality standards. In addition, the general contractor and all related subcontractors associated with the project would be required to have a valid operation permit from the Tennessee Air Pollution Control Division or to obtain an exception from the regulations through board action.

SAFETEA-LU Statute of Limitations on Filing Claims

FHWA may publish a notice in the Federal Register, pursuant to 23 USC §139(l), indicating that one or more Federal agencies have taken final action on permits, licenses, or approvals for the subject transportation project. If such notice is published, claims seeking judicial review of those Federal agency actions will be barred unless such claims are filed within 180 days after the date of publication of the notice, or within such shorter time period as is specified in the Federal laws pursuant to which judicial review of the Federal agency action is allowed. If no notice is published, then the periods of time that otherwise are provided by the Federal laws governing such claims will apply.

Environmental Commitments

Social Commitments

TDOT, the City of Memphis, and representatives of the French Fort neighborhood have agreed upon an option that would provide the displaced residents from the French Fort neighborhood an option to purchase property, currently owned by the City of Memphis, on which they could build comparable replacement housing. The property consists of vacant land located adjacent to the west side of the existing French Fort neighborhood. This would allow those displaced residents who wish to remain part of the French Fort neighborhood and local community enough space to relocate in the area and would therefore help to maintain neighborhood cohesion.

Provision of bicycle or pedestrian accommodations will be determined during the remainder of the planning and final design phase of the project. TDOT will continue to work with local officials and citizens to determine what features can be included with the new interchange. Due to the nature of this project, safety issues may prohibit bicycle and pedestrian accommodations within much of the project ROW.

Natural Resources Commitments

Although no wetland impacts are expected, if any wetlands are encountered during any phase of this project, TDOT would attempt to avoid them or would obtain the appropriate permits to fill or drain the wetlands, as necessary. As part of the permit process, TDOT would work with the appropriate regulatory agencies to determine what mitigation measures may be required.

Noise Commitments

Based on preliminary evaluation, a noise barrier would be considered feasible and reasonable and warrants construction to provide noise abatement for residents in the French Fort Neighborhood. The final decision on implementation of abatement measures will be made during the project design phase and after consideration of input from the public involvement process.

Cultural Resources Commitments

Since there would be direct and indirect impacts to Site 40SY709 from both build alternatives (Alternative A and Alternative B) and since the site has mixed features from the Civil War era and late nineteenth and early twentieth century residential occupation, Phase II testing will be conducted at Site 40SY709 prior to issuance of the Final EIS. TDOT in coordination with the SHPO commits to making the requisite investigations and mitigation necessary to avoid, minimize, or mitigate potential impacts to this site. If archaeological resources are encountered, a representative of the appropriate Native American Tribe(s) will be notified.

Visual Commitments

Short-term visual impacts are expected with any construction project due to construction equipment, grading, and storage of materials on site. Most visual impacts due to construction typically end once a project is complete. One of the goals of most modern construction projects, including TDOT roadway projects, is typically to provide structures or facilities that fit into the surrounding setting or context as well as possible so the visual affect is an improvement over existing conditions. If not perceived as an improvement, the goal would be to maintain the general visual quality in an area to the extent practical.

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Mitigation measures for visual impacts will include, but will not be limited to:

- Consideration of post-project aesthetic appeal during the project's functional design, surveying and clearing.
- Preparation of areas within the ROW to permit successful revegetation programs that accommodate, preserve and capitalize on mature and semi-mature stands of vegetation. Where feasible native vegetation will be used during revegetation efforts. This may be accomplished either naturally or through planned seeding.

TDOT will continue to work closely with the City of Memphis and local residents to obtain and develop ideas for designing and constructing a new I-55 Interchange that fits the context of the area and with any future plans for the area.

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CHAPTER 1

1.0 INTRODUCTION

1.1 Background

The Interstate 55 (I-55) Interchange at E.H. Crump Boulevard (U.S. 64) and South Riverside Boulevard currently handles most north and southbound I-55 traffic through Memphis, Tennessee. Interstate 55 is one of the major north-south transit corridors of the United States, linking New Orleans, Louisiana; Jackson, Mississippi; Memphis, Tennessee; northeast Arkansas; St. Louis, Missouri; and Chicago, Illinois. Figure 1.1 depicts the location of the project in Memphis, Tennessee.

The Tennessee Department of Transportation (TDOT) proposes to improve the I-55 Interchange at E.H. Crump Boulevard and South Riverside Boulevard, henceforth I-55 Interchange, near the western edge of the City of Memphis in Shelby County, Tennessee. The I-55 Interchange currently accommodates large amounts of personal automobile and commercial truck traffic. The current configuration of the I-55 Interchange in Memphis, Tennessee is antiquated and creates multiple safety and efficiency problems. The proposed project would involve reconfiguring the cloverleaf design of the existing I-55 Interchange into a configuration that reduces crashes, relieves congestion, and provides route continuity by eliminating the need for mainline I-55 traffic to utilize single-lane, low-speed ramps. The various alternatives being considered are described in more detail in Chapter 2, Alternatives.

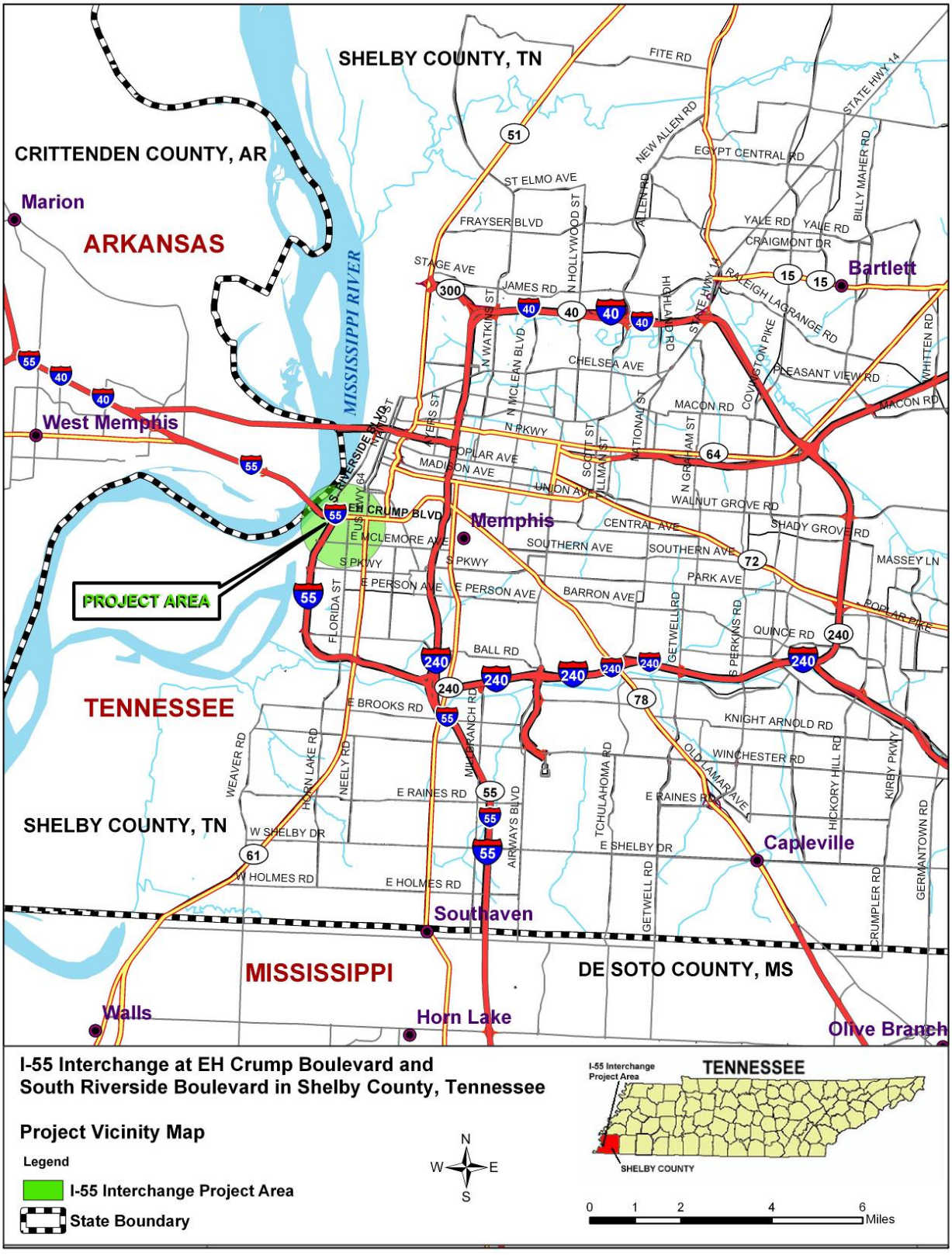
Ultimately, the final design of the new interchange will be a result of continued coordination and cooperation with various agencies, organizations, and other stakeholders for the project. The overall goal of the new I-55 Interchange would be to provide a facility that would adequately serve the future transportation needs of the area while minimizing adverse human and environmental impacts to the extent practical by implementing impact avoidance, minimization, and/or mitigation efforts.

1.2 Description of Project Area

The project limits begin at the east termination of the I-55 Mississippi River Bridge in Memphis and extend southward along I-55 to near Wisconsin Avenue. The project study area generally consists of a 500-foot corridor along the existing footprint of I-55 from the Mississippi River Bridge extending south to McClemore Avenue. The entire footprint of the existing I-55 Interchange with E.H. Crump Boulevard and South Riverside Boulevard is included in the study area. The total length of the study area is approximately 1.5 miles. A map of the project area vicinity is shown in Figure 1.1. Figure 3.1 in Chapter 3 shows the study area boundaries for the various resources studied in the EIS.

The I-55 Interchange project area is located at the western edge of the West Tennessee Plain adjacent to the Mississippi River. At the project location, the West Tennessee Plain extends to the Mississippi River and terminates as a bluff line. The Mississippi River Alluvial Valley is non-existent on the Tennessee side of the river adjacent to the project area. The proposed project area is located within the City of Memphis, Tennessee, in a highly urbanized area. It lies above the 100-year and 500-year floodplain.

Figure 1.1 Project area and vicinity of the Interstate 55 Interchange at E.H. Crump Boulevard and South Riverside Boulevard.



1.3 Need for the Project

Interstate 55, in the vicinity of the E.H. Crump Boulevard and South Riverside Boulevard Interchange, was constructed in the mid 1960's with a geometric design that does not meet current Federal or State standards. The existing I-55 is a four-lane median-divided highway with one auxiliary lane in both directions. Numerous weave areas are located within the subject area, as well as substandard acceleration and deceleration lengths for most ramp junctions. The existing I-55 Interchange is a full cloverleaf design with loop ramps in all four quadrants. All exiting and entering traffic from these loops are required to make weaving maneuvers. The posted speed limit for these ramps is 25 miles per hour (mph), but average speeds through portions of the interchange typically range from 5 to 10 mph.

This project is listed in the current Memphis Urban Area Metropolitan Planning Organization (MPO) 2030 Long Range Transportation Plan (LRTP Project ID = 60030002). The project was included in the previous the 2004-2006 Transportation Improvement Program (TIP), but was not listed in the most recent 2008-2011 TIP since the project had not moved beyond the NEPA phase and it was not known if construction would commence by 2011. If a Build Alternative is selected and carried forward to the right-of-way acquisition and construction phases, it would be included in the TIP. The project is listed as one of the MPO's top 20 Strategic Road Projects. Begun in 1998, the Strategic Road Projects campaign is designed to inform local and state officials on the needs of Memphis and Shelby County to address critical concerns about road projects in the area. When the process began, of the top 20 projects identified locally as a strategic project, only 3 had actions being taken on them by either local or state agencies. Today, 17 of the 20 projects are actively being moved through the development process, including the I-55 Interchange Project.

1.3.1 Previous Studies and Traffic Analyses

Traffic analysis has indicated that the existing interchange is inadequate to handle current and design year traffic volumes. The configuration, the close proximity of adjacent interchanges, and the associated weave and merge problems severely congest the area. The crash history for the area shows a high number of side-swipe and rear-end collisions, which are directly attributable to the interchange configuration and heavy traffic volumes.

The original traffic conditions and the proposed alternatives were developed in the June 2002, *I-55 and US 64 (Crump Boulevard) Interchange Modification Study* (IMS). The preliminary traffic analyses completed for the 2002 IMS indicated that the existing interchange would be inadequate to handle base and design year traffic volumes. The IMS concluded that the current interchange configuration, the proximity of adjacent interchanges, and associated weave and merge problems severely congest the area. In early 2007, a new regional travel model was completed for the Memphis Urban Area MPO. TDOT used this model to provide updated travel forecasts for a base year of 2012 and a design year of 2032. These updated traffic analyses superseded the previous traffic analyses conducted as part of the 2002 IMS. Updated traffic volume projections for the I-55 Interchange project area are shown on Table 1.1. For Year 2012, these volumes are estimated at 60,870 Annual Average Daily Traffic (AADT), and for Year 2032 they are estimated to be 85,220 AADT.

Table 1.1. Traffic volume projections for the I-55 Interchange at E.H. Crump Boulevard and South Riverside Boulevard in Memphis, Tennessee.

	Base Year (2012)	Design Year (2032)			
Roadway	**AADT**	**AADT**	**Percent Trucks in AADT**	**DHV**	**Percent Trucks in DHV**
Existing System (No Build Alternative)	60,870	85,220	27%	6,818	18%
Alternative A	60,870	85,220	27%	6,818	18%
Alternative B	61,840	86,550	27%	6,924	18%

AADT = Annual Average Daily Traffic (number of vehicles)
DHV = Design Hour Volume (i.e., highest number of vehicles projected during the peak hour traffic)

Source: TDOT Project Planning Division, 2007

Updated capacity analyses were performed using the methodologies of the Highway Capacity Manual (HCM), which is the industry-standard resource for this purpose and is published by the Transportation Research Board. The capacity analyses were conducted using the Highway Capacity Software, version 5.21 (HCS+), which is owned by the McTrans Center at the University of Florida. Ramp junctions, weaving areas, basic freeway segments, and unsignalized intersections were all analyzed using separate modules of the software. For signalized intersections, a program called Synchro, a product of Trafficware™, was used.

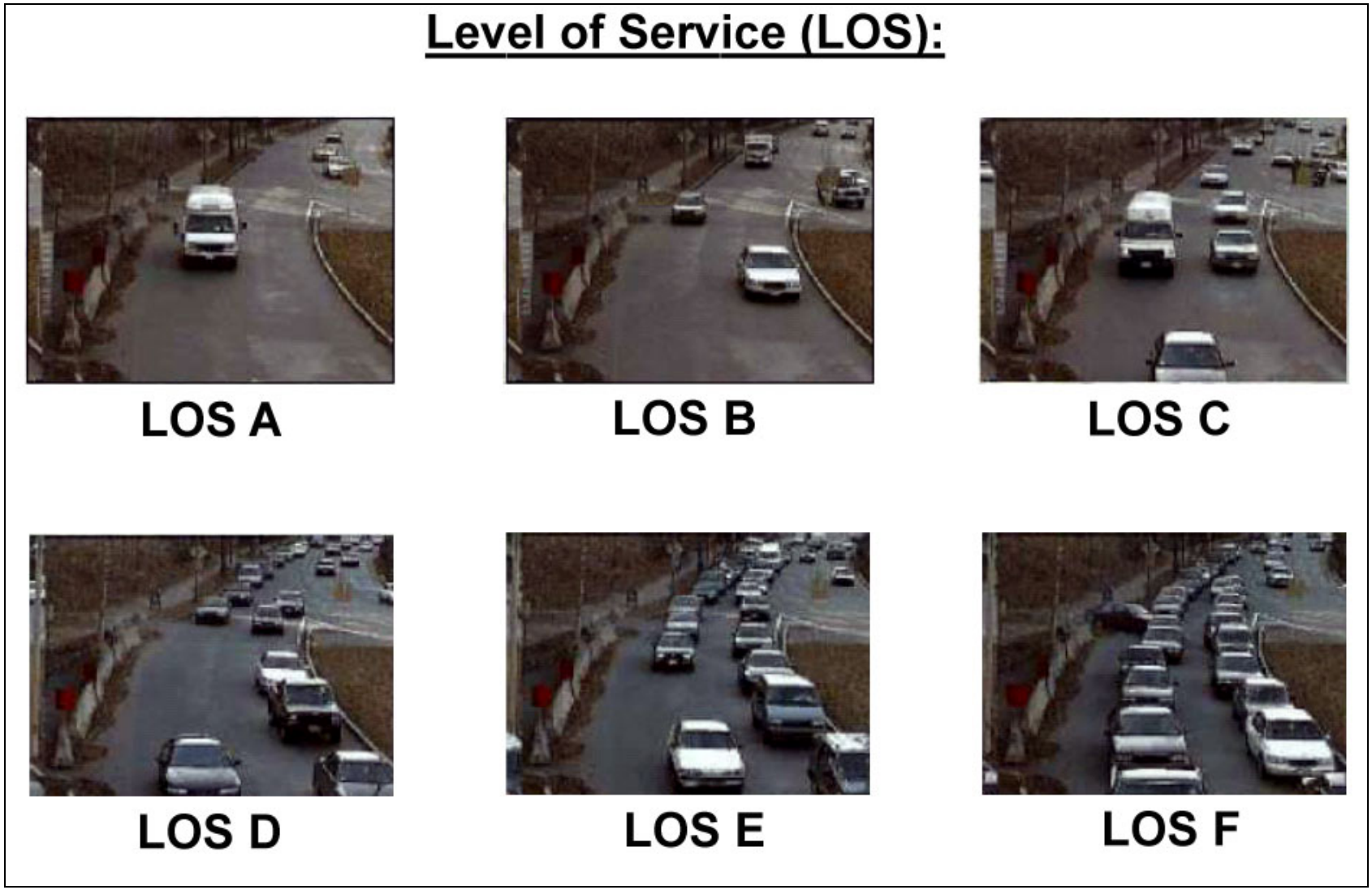
1.3.2 Traffic Study Findings – Existing Interchange (No Build Alternative)

Capacity analysis findings are reported in terms of Levels of Service (LOS). LOS describes the character of traffic flow for a particular roadway segment or intersection. The levels are like school grades A through F where:

- Level A = Primarily free flow operations;
- Level B = Reasonably free flow operations;
- Level C = Stable operation, approaching a range in which small increases in flow will cause substantial deterioration in services;
- Level D = Borders on unstable flow;
- Level E = Extremely unstable operations; and
- Level F = Forced or breakdown flow.

Figure 1.2 contains a graphical representation of the different LOS to show what each may look like in an everyday situation.

Figure 1.2 Graphical Depiction of the Levels of Service (LOS) used to describe Roadway Capacity.



The existing I-55 interchange at E.H. Crump Boulevard and South Riverside Boulevard operates at unacceptable LOS. The existing cloverleaf configuration places very high volumes of through traffic traveling on I-55 onto single-lane ramps. These weave areas are constrictions that form queues of traffic and impede traffic flow upstream in both directions. The problem is especially severe for northbound traffic, which regularly queues as far south as the McLemore Interchange and often through the South Parkway Interchange. These long queues have been a problem for many years and are a source of extensive travel delays. The cloverleaf configuration of the existing I-55 Interchange with E.H. Crump Boulevard and South Riverside Boulevard, and the proximity to the Metal Museum Drive ramps, results in a large number of weaving sections carrying high volumes.

The existing I-55 Interchange operates at LOS F and would continue to operate at LOS F in both directions in the base year 2012 and design year 2032 estimated as part of the updated traffic analyses. The freeway portions of the project area (primarily I-55 west of Alston Avenue) are estimated to operate at LOS D in 2012 and LOS E in 2032. However, because the weave areas associated with the existing I-55 Interchange with E.H. Crump Boulevard and South Riverside Boulevard operate at LOS F, the LOS D and LOS E on the freeway portions of I-55 offer modest benefits in terms of moving traffic through the project area in an efficient and safe manner. If no improvements are made within the existing I-55 weave areas that make up the majority of the existing I-55 Interchange within the project boundaries, traffic flows would not improve from LOS F in the reasonably foreseeable future.

Ramp junctions, including the ramps to Alston Avenue, Metal Museum Drive, and E.H. Crump Boulevard, are estimated at LOS D or better in 2012 and LOS E or better in 2032 under the No Build Alternative. The ramp junctions are not expected to reach levels as low as LOS F by 2032 primarily because the travelers on the weave and freeway sections of I-55 must slow down substantially in order to traverse the existing cloverleaf. This would allow traffic from the other secondary ramps to gradually merge into the slow moving I-55 traffic without major backups occurring on those secondary ramps. However, once that traffic entered I-55, it would likely be within one of the weave segments that consist of LOS F conditions. Therefore, overall travel times to and from the area would continue to be impacted by the poor LOS on the majority of I-55 within the project area.

1.3.3 Traffic Study Findings – With the Proposed Interchange Improvements (Build Alternatives)

Each of the proposed Build Alternatives is configured to make the main lanes of I-55 fly over the existing roadway connection to E.H. Crump Boulevard and South Riverside Boulevard so that the mainline I-55 traffic is not forced to use the existing cloverleaf interchange. The Build Alternatives make use of portions of the existing cloverleaf to provide connections to E.H. Crump Boulevard and/or South Riverside Boulevard. Detailed descriptions and maps of the design and layout of the proposed Build Alternatives are contained in the Alternatives Chapter below.

For the Build Alternatives, the flyover bridges for the main lanes of I-55 are configured with a design speed of 50 mph. It is expected that the typical running speed through these curves will be approximately 55 mph. This will result in some congestion on the main lanes, but substantially less than experienced with the existing conditions. The reduced mainline travel speed will also make weaving, merging, and diverging activities easier to accomplish, so that the ramp junctions for the proposed Build Alternatives are anticipated to have acceptable LOS. The number of weaving areas is greatly reduced for the Build Alternatives, and the operating character of the proposed weaving areas is substantially better than the No Build Alternative.

In general, all weave areas, ramps, and freeway portions of I-55 within the project area would operate at LOS D or better in 2012 and LOS E or better in 2032. This would provide substantial improvement to the already poor LOS F conditions that occur at the present time. The LOS on I-55

could likely be even better than LOS E in 2032 under the proposed Build Alternatives if other portions or features of I-55 were improved under subsequent projects. For instance, the existing narrow lanes and lack of shoulders on the Memphis-Arkansas Bridge over the Mississippi River and the curvature of the existing I-55 roadway result in decreased LOS. Additional traffic lanes in each direction, increased design speeds, or increased shoulder widths would all have potential to improve LOS in addition to the proposed I-55 Interchange with E.H. Crump Boulevard and South Riverside Boulevard discussed in this document. More detailed traffic information is contained under the descriptions of each of the Build Alternatives contained in Chapter 2, Alternatives.

Improving the I-55 Interchange as proposed under any of the proposed Build Alternatives would provide a logical freeway facility that connects portions of I-55 located west of Memphis to portions of I-55 south of Memphis. The proposed project has logical termini and independent utility. The proposed interchange improvements would reduce congestion, reduce crashes, restore interstate continuity, and would not restrict consideration of alternatives of other reasonably foreseeable transportation improvements.

1.3.4 Traffic Safety

Crash data from the existing I-55 Interchange were analyzed to determine crash trends and potential safety issues. Table 1.2 contains a summary of crash data collected within the project area during the 2005-2007 period. There were a total of 99 crashes in the project area during a three-year period from 2005 through 2007 resulting in a total of 28 persons being injured. No fatalities were reported during the three-year period.

When compared to the statewide average crash rate for urban interstates, the section of I-55 studied within the immediate project area is well above the statewide average rate. The analysis revealed that I-55 in the project limits has a crash rate that is more than three times higher than the statewide average and more than two times higher than the critical rate as shown in Table 1.2. The portions of E.H. Crump Boulevard and South Riverside Boulevard studied exhibited crash rates that were below the statewide average and critical rates for similar types of roadways.

The crash history for the area shows that a high number of collisions may be directly attributable to a combination of the existing I-55 interchange configuration and heavy traffic volumes. Those two factors result in frequent traffic congestion. This congestion, primarily caused by I-55 traffic being required to use the cloverleaf ramps to pass through the area, results in an abundance of rear-end and side-swipe type crashes. Most of the crashes in the project area are rear-end accidents that occur on I-55 along the roadway segments approaching the weave and ramp areas where traffic tends to back up most frequently. A total of 10 of the I-55 crashes occurred on the cloverleaf ramps. Eighteen crashes in the project area from 2005 through 2007 involved vehicles containing hazardous cargo. A total of 36 crashes involved heavy trucks.

Table 1.2. Crash data for the I-55 Interchange at E.H. Crump Boulevard/South Riverside Boulevard in Memphis, Tennessee during the 2005-2007 period.

	Crash Rates				Crash Location			Manner of Crash				
Roadway	**Actual Crash Rate** (A)	**Critical Crash Rate** (C), **(Ratio of A/C)**	**Statewide Average Rate**	**# of Crashes**	***Along Roadway**	**Ramp**	**Intersection**	**Rear-End**	**Side-Swipe**	**Angle**	**Head-On**	**One Vehicle Crash/ Other**
Interstate 55 (Classified as Interstate Urban)	6.818	2.907, A/C=2.35	1.854	68	85%	15%	NA	50%	22%	13%	3%	12%
E.H. Crump Boulevard (Classified as Urban Other Principal Arterial)	1.671	4.343 A/C=0.38	3.266	27	37%	22%	41%	30%	33%	7%	0%	30%
South Riverside Boulevard (Classified as Urban Minor Arterial)	0.216	4.133 A/C=0.05	3.146	4	75%	0%	25%	25%	25%	25%	0%	25%

2005-2007 Crash Data from:
I-55 from LM 11.51 to 11.65;
E.H. Crump Boulevard from LM 0.00 to 0.090; and
South Riverside Boulevard from LM 0.00 to 0.09.

* Crashes that occurred on bridges or under overpasses were included in the "Along Roadway" category in this analysis.

Source: TDOT Project Planning Division, Safety Planning Section, August 2008.

Based on the crash trends for the area, it is anticipated that improvements to the I-55 Interchange would decrease the number of crashes and the resulting injuries. The improvements to the interchange would reduce traffic congestion that is ultimately responsible for many of the crashes that currently occur in the area. Allowing the I-55 traffic to move more efficiently through the area without being forced to utilize the existing cloverleaf ramps would reduce the frequency of traffic jams and the resulting rear-end and side-swipe type accidents.

1.3.5 Summary of Purpose and Need and General Project Data

To summarize, improving the I-55 Interchange would provide a logical freeway facility that connects portions of I-55 located west of Memphis to portions of I-55 located south of Memphis. The proposed interchange would reduce congestion, reduce crashes, restore interstate route continuity, and would not restrict consideration of alternatives of other reasonably foreseeable transportation improvements. Table 1.3 contains project summary information for the proposed improvement of the I-55 Interchange.

Table 1.3. Summary of Project Data for the I-55 Interchange at E.H. Crump Boulevard and South Riverside Boulevard in Memphis, Shelby County, Tennessee.

Item	No-Build	Alternative A	Alternative B
Functional Classification	Interchange	Interchange	Interchange
System Class	Interstate Transportation System	Interstate Transportation System	Interstate Transportation System
Length - Miles	0.75	0.75	0.75
Cross-sections – Feet	110 feet	134 feet	134 feet
Year 2012 AADT	60,870	60,870	61,840
Year 2032 AADT	85,220	85,220	86,550
Percent Trucks (DHV)	27% (6,818)	27% (6,818)	27% (6,924)
Estimated Right-of-Way Acquisition – (Acres)	0	6.2	4.10
Estimated Right-of-Way Tracts Affected	0	9	8
Residential Displacements	0	8	8
Business Displacements	0	2	1
Estimated Right-of-Way Cost	0	$3,140,000	$2,650,000
Estimated Utility Cost Reimbursable	0	0	0
Estimated Utility Cost Non-Reimbursable	0	$399,600	$209,250
Estimated Engineering/Construction Cost	0	$28,875,000	$28,710,000
Total Estimated Project Cost	0	$32,414,600	$31,569,250

Source: Tennessee Department of Transportation, 2009

1.4 Purpose of the Project

The purpose of the proposed project is to provide a balanced solution for safety and capacity issues at the I-55 Interchange. Benefits and core objectives of the interchange improvement project include reduced congestion, reduced number of crashes, and restored north and south mainline interstate route continuity. Restored route continuity would serve national security and national defense objectives while providing economic benefits by improving north- and south-bound freight transport.

CHAPTER 2

2.0 ALTERNATIVES

2.1 Introduction

The original traffic conditions and the proposed alternatives were developed in the June 2002, *I-55 and US 64 (Crump Boulevard) Interchange Modification Study* (IMS). The preliminary traffic analyses completed for the 2002 IMS indicated that the existing interchange would be inadequate to handle base and design year traffic volumes. The IMS concluded that the current interchange configuration, the proximity of adjacent interchanges, and associated weave and merge problems severely congest the area. Three main alternatives are proposed to be evaluated in this Environmental Impact Statement (EIS), the No-Build Alternative and two Build Alternatives. The No-Build Alternative would mean that no major improvements would be made to the existing interchange, and only routine maintenance activities would continue to be conducted.

2.2 Project Alternatives to be Evaluated

Since the study began as part of the IMS, several potential Build Alternatives were considered for the I-55 Interchange improvements. On January 22, 2007, TDOT notified all appropriate Federal, State, and local planning/resource management agencies, Native American Nations/Tribes, and private groups by letter about the proposed I-55 Interchange EIS. Each party was invited to comment upon any possible environmental, economic, and/or social impacts within their special area(s) of expertise and/or concern. This initial coordination effort afforded concerned agencies, local officials, and citizens an opportunity to provide input into the project planning process during the early stages of project development.

In addition to the initial coordination efforts, several meetings with agencies, organizations, residents, and other stakeholders resulted in several alternatives being recommended for elimination from consideration due to various reasons. Meetings with officials and stakeholders occurred throughout the development of this project including meetings in October 2004, October 2005, and December 2005. A project website (*http://www.tdot.state.tn.us/i55/default.htm*) was created, and informational newsletters were released as the project was developed.

The final selection of the most appropriate alternative will not be made until all environmental impacts and public comments have been taken into consideration.

Screening criteria used to determine which alternatives to pursue include the following:

- The alternative must meet the general project Purpose and Need including providing a balanced solution for safety and capacity issues at the I-55 Interchange;
- The alternative must seek to avoid or minimize impacts to the social, economic, natural, and cultural resources within the project vicinity;
- Build alternatives must be reasonable and feasible to construct; and
- The alternative must meet design standards as defined in American Association of State Highway and Transportation Officials (AASHTO) “A Policy on Geometric Design of Highways and Streets” which outlines the criteria for urban freeways in Chapter 8 by stating, “… design speed should not be less than 80 km/hr (50 mph).” This design guide notes, “… higher design speeds are closely related to the overall quality and safety of a facility.”

- The two proposed Build Alternatives, Alternative A and Alternative B, utilize the same general design with variations in the arrangement of exits and secondary roads. The proposed design speed for the Build Alternatives would be 50 mph. Traffic operations would be improved by implementation of either Alternative A or Alternative B with all movements operating at a more desirable LOS in the design year than would occur with the No-Build Alternative. Other Build Alternatives were also considered for this project but were recommended for elimination from further consideration due to various reasons described later in this chapter.

The No-Build Alternative and the Build Alternatives are discussed below. Additional details regarding the development of these alternatives and the associated preliminary analyses were described in more detail in the *Interstate 55 and U.S. 64 (Crump Boulevard) Interchange Modification Study* (IMS, 2002).

2.2.1 The No-Build Alternative

The No-Build Alternative, as implied, denotes that only minor changes, such as safety enhancements and routine maintenance, would be made to the existing interchange. No improvements or substantial alterations would be made to the existing interchange configuration, and no new structures would be added to the existing infrastructure. The No Build Alternative would be studied throughout the NEPA process and can be used as a tool for comparing potential impacts associated with the proposed Build Alternatives. Figure 2.1 depicts the layout of the existing I-55 Interchange (No-Build Alternative).

Figure 2.1. Existing I-55 Interchange (No-Build Alternative) in Memphis, Tennessee.

The No-Build Alternative would not meet the Purpose and Need of the I-55 Interchange project because it would not reduce congestion, reduce crashes, or restore interstate route continuity. The existing interchange would not provide a balanced solution for safety and capacity issues at the I-55 Interchange. As discussed in Chapter 1 of the EIS, the existing interchange operates at unacceptably poor LOS. The weave areas associated with the existing cloverleaf places very high volumes of through-traffic on I-55 onto single-lane ramps resulting in LOS F. These form queues of traffic and impede traffic flow upstream for north and southbound traffic. The problem is especially severe for northbound traffic, which regularly queues through the McLemore Interchange and through the South Parkway Interchange. These long queues have been a problem for many years, and they are a source of extensive travel delays.

Even if other enhancements were made to the existing transportation infrastructure through Transportation System Management (TSM) approaches, or through other efforts such as Transportation Demand Management (TDM), those efforts alone would not be enough to negate the traffic capacity concerns within the I-55 Interchange area. The TDM efforts would involve the use of one or more strategies designed to encourage more efficient use of transportation systems, most notably to reduce the use of private vehicles, especially at peak periods. TDMs are numerous and address everything from transportation modes to the time at which trips take place. However, the most influential strategies involve adjusting the cost and/or supply of specific transportation-related factors. For example, a combined approach of reimbursing the cost of transit and reducing free off-street parking may result in more people switching from private vehicle trips to transit or other non-motorized mode trips. There are currently no commuter rail or light rail transit available in the project vicinity.

In addition to TDM strategies, TSM techniques would involve minor improvements to the existing interchange that would primarily remain within the existing ROW and may include addition or changes in traffic signals, signs, and/or minor ramp or turn lane improvements. Based on the findings of the IMS, these options are not recommended as reasonable alternatives because implementation of one, or both, of these alternatives would not meet the Purpose and Need of this project. In other words TSM or TDM alternatives would not be enough to reduce congestion, reduce crashes, or restore interstate route continuity. Therefore, even with other improvements such as TDM or TSM strategies, the Purpose and Need would not be met under the No Build Alternative.

The primary reason those efforts would not be expected to work is because much of the traffic passing through the project area is considered through-traffic traveling long distances. Therefore, enhancing the local public transportation system would not reduce enough traffic to improve LOS on the existing system. Similarly, implementing other TSM techniques would only slightly improve the existing system but would not alleviate the overall problems with the interchange design and configuration within the existing ROW. Therefore, the interchange would remain a bottleneck for north and southbound I-55 traffic and continue to result in poor LOS. The addition of HOV lanes to segments of I-55 would not relieve the level of traffic congestion suggested by traffic projections for these facilities. Also, HOV lanes would not meet the Purpose and Need of the proposed action, which is to improve traffic circulation within the whole interchange area and to improve overall safety of the interchange area.

2.2.2 Build Alternative A

Alternative A consists of proposed modifications to the I-55 Interchange that would improve traffic movements along and between the I-55 and McLemore Interchange and the Mississippi River Bridge. The proposed improvements would provide I-55 traffic with continuous free-flow mainline movements by eliminating the need to utilize one-lane exit/entrance ramps to remain on the interstate. The existing loop ramp in the southwest quadrant would be removed, thus improving safety by eliminating the associated weave movement in this area. Existing infrastructure would be utilized where feasible, and all efforts would be made to maintain driver expectancy throughout the corridor. This alternative would require the construction of three new structures, construction of substantial retaining walls, relocation of approximately eight residences and two businesses, and elimination of the existing ramps to the nearby Metal Museum. The design speed for Alternative A is 50 mph. Figure 2.2 and Figure 2.3 depict the layout of Alternative A. Specific changes associated with Alternative A include:

- Northbound I-55 traffic wishing to remain on I-55 would utilize two inside travel lanes. Northbound I-55 traffic wishing to access the central Memphis business district would use South Riverside Boulevard via an outside auxiliary lane. In order to provide access to E.H. Crump Boulevard from Northbound I-55, minor changes would be made to the existing ramp. Northbound I-55 motorists would be able to access the Metal Museum by exiting onto E.H. Crump Boulevard and turning left onto Illinois Avenue.
- Southbound I-55 traffic from the Mississippi River Bridge wishing to remain on I-55 would utilize two inside travel lanes. Southbound I-55 traffic wishing to access E.H. Crump Boulevard would utilize a proposed exit ramp to a new connector at Illinois Avenue. Flow from the exit ramp to the new connector would be controlled by a traffic light. It is important to note that this design constitutes a partial interchange, which is discouraged by the AASHTO design standards for interstate systems. The traffic light at Illinois Avenue has the potential to create unsafe conditions by backing vehicles onto I-55 during abnormal traffic flow periods. The configuration of this ramp also has the potential to create dangerous wrong-way encroachments, whereby errant drivers may turn onto the ramp from the local street and travel the wrong direction onto the interstate mainline.
- Traffic from westbound E.H. Crump Boulevard to northbound I-55 would utilize a tapered ramp in the vicinity of the former Metal Museum exit. Westbound traffic from E.H. Crump Boulevard to southbound I-55 would utilize the existing northwest loop ramp to access an auxiliary ramp. This auxiliary ramp would merge traffic from E.H. Crump Boulevard with traffic from South Riverside Boulevard prior to merging with southbound I-55. Traffic from westbound E.H. Crump Boulevard to northbound South Riverside Boulevard would utilize the existing ramp that joins South Riverside Boulevard just south of the CSX railroad overpass.
- Southbound South Riverside Boulevard traffic would utilize the existing ramp to access westbound I-55 into Arkansas and would yield before merging with mainline interstate traffic. Southbound traffic from South Riverside Boulevard to southbound I-55 would utilize a proposed ramp beneath the four-lane mainline structure. This ramp would also serve as an auxiliary lane to the McLemore Avenue interchange. A new connector road would provide access to the southern residential community from South Riverside Boulevard. Through traffic on South Riverside Boulevard would be continuous through the proposed intersection via connector roads and would never have to enter the interstate system.

The flyover bridges for the main lanes of I-55 are configured with a design speed of 50 mph. It is expected that the typical running speed through these curves will be approximately 55 mph. This will result in congestion on the main lanes but far less than experienced with the existing conditions. The

reduced mainline travel speed will also make weaving, merging, and diverging activities easier to accomplish, so that the ramp junctions for Alternatives A are anticipated to have acceptable operating characteristics. The number of weaving areas is greatly reduced under Alternative A, and the operating character of the proposed weaving areas is substantially better than No-Build conditions.

In general, all weave areas, ramps, and freeway portions of I-55 within the project area would operate at LOS D or better in 2012 and LOS E or better in 2032 with the proposed improvements associated with Alternative A. This would provide substantial improvement to the already poor LOS F conditions that occur at the present time.

Improved operation for the ramp junctions is expected in part because of the reduced speeds that are anticipated for the main lanes of I-55 through the interchange area. If the main lanes were anticipated to operate at higher speeds, then ramp operations would be expected to become congested, due to a limitation in the number of acceptable gaps for merging into the flow of I-55 traffic.

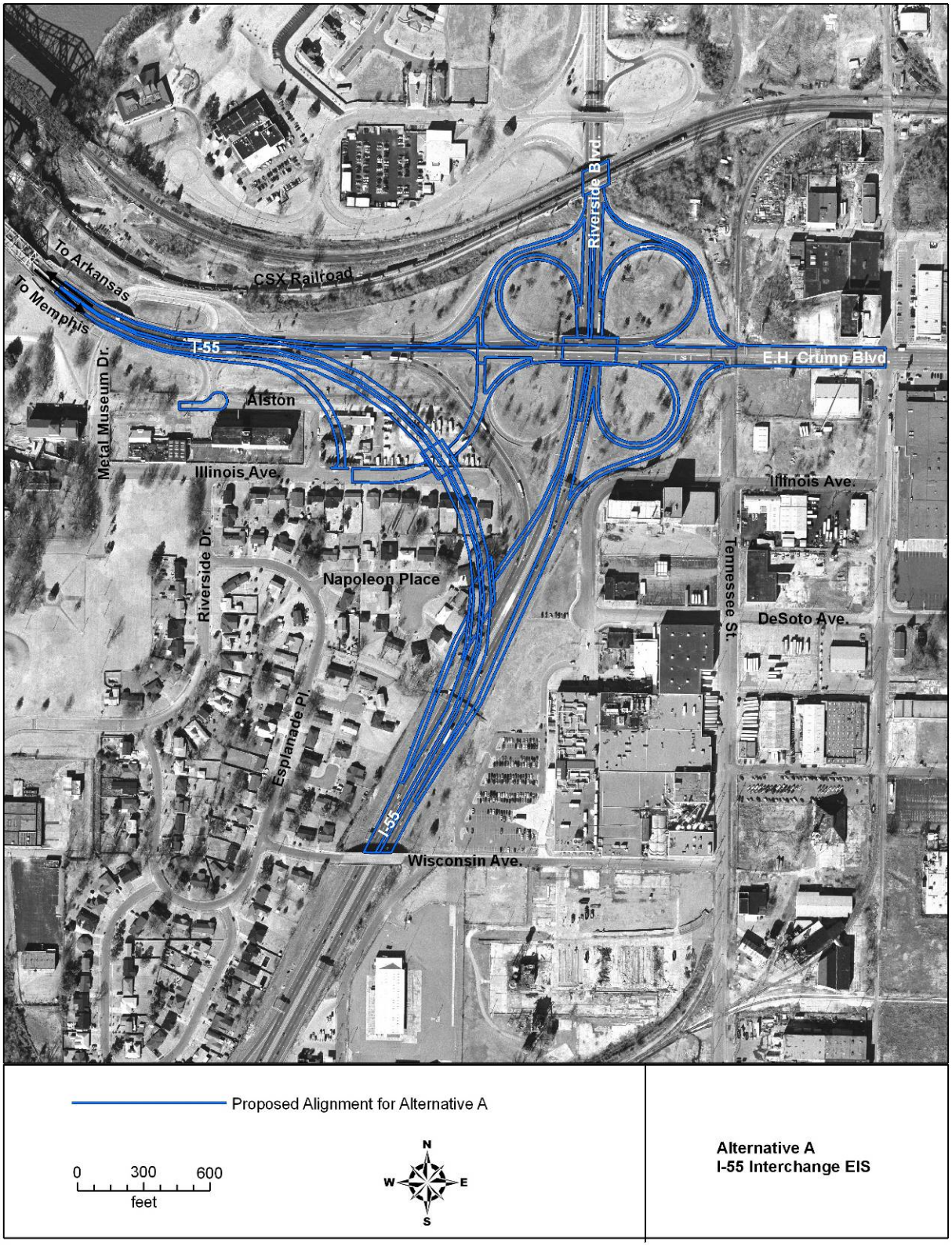
For Alternative A, all proposed weaving areas are expected to operate at LOS C or better for both year 2012 and year 2032 conditions, except for the weaving area that will result in the southbound direction south of the proposed interchange. The proposed weaving area in the southbound direction between the proposed interchange and the existing McLemore Avenue Interchange is anticipated to operate at LOS D for morning conditions in the year 2032 but to operate at LOS E for afternoon conditions in the year 2032. This is primarily because this weaving area will be reduced in length.

Basic freeway operation north of the proposed interchange is anticipated to operate at LOS E in both directions for year 2032 conditions for both morning and afternoon peak conditions. This is primarily due to the limitations of the Memphis-Arkansas Bridge over the Mississippi River, with the narrow lanes and lack of shoulders, and is also due to the curvature of the existing I-55 roadway.

All of the proposed intersections in Alternative A are anticipated to operate at LOS C or better in the year 2032. It appears that the intersection of the proposed Alternative A southbound exit ramp and Illinois Avenue may not reach volumes that would warrant a traffic signal for a number of years; however, it is recommended that this intersection be signalized in order to ensure that the ramp clears and does not form queues that back out onto the southbound main lanes.

Figure 2.2. Alternative A Interchange Layout (artist rendering) in Memphis, Tennessee.

Figure 2.3. Alternative A for the I-55 Interchange Project in Memphis, Tennessee.



2.2.3 Build Alternative B

Alternative B maintains the basic design as Alternative A, but it incorporates modifications to address concerns over continuity for southbound I-55 motorists wishing to access E.H. Crump Boulevard immediately after crossing the Mississippi River. Southbound I-55 motorists would be provided continuous access to E.H. Crump Boulevard via an outside auxiliary road that would cross under the four-lane mainline structure. The two signalized intersections on Illinois Avenue proposed in Alternative A would be eliminated. Figure 2.4 through Figure 2.5 depict the proposed layout of Alternative B.

Unlike Alternative A, this option does not include direct access to the residential and commercial properties on Illinois Avenue from I-55. However, it does provide the southwest quadrant with direct access to eastbound E.H. Crump Boulevard via an added lane that connects to the outside auxiliary lane from southbound I-55. Vehicles traveling westbound on E.H. Crump Boulevard would be able to utilize the existing ramp to access Metal Museum Drive. Motorist traveling north on I-55 would have to exit at E.H. Crump Boulevard and use the northeast loop in order to access Metal Museum Drive. Southbound Riverside Boulevard does not have access to eastbound E.H. Crump Boulevard.

This design would require relocation of nine residences and one business. Unlike Alternative A, this alternative maintains the continuity of E.H. Crump Boulevard by eliminating two at-grade intersections. It also provides a more direct access to E.H. Crump Boulevard and South Riverside Boulevard.

The flyover bridges for the main lanes of I-55 are configured with a design speed of 50 mph. It is expected that the typical running speed through these curves will be approximately 55 mph. This will result in congestion on the main lanes, but far less than experienced with the existing conditions. The reduced mainline travel speed will also make weaving, merging, and diverging activities easier to accomplish, so that the ramp junctions are anticipated to have acceptable operating characteristics. The number of weaving areas is greatly reduced for Alternative B, and the operating character of the proposed weaving areas is substantially better than No-Build conditions.

In general, all weave areas, ramps, and freeway portions of I-55 within the project area would operate at LOS D or better in 2012 and LOS E or better in 2032 with the proposed improvements associated with Alternative B. This would provide substantial improvement to the already poor LOS F conditions that occur now.

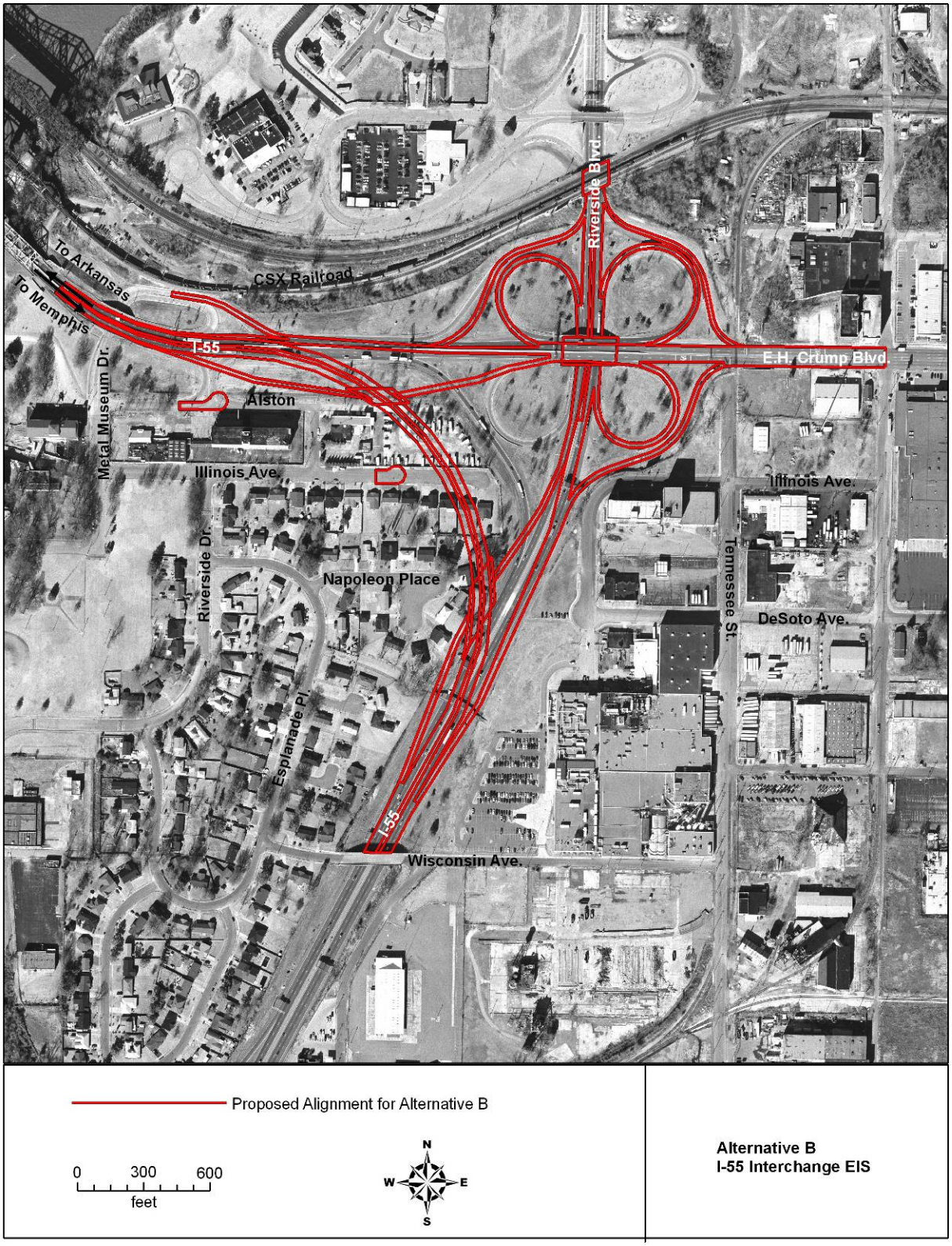
Improved operation for the ramp junctions is expected in part because of the reduced speeds that are anticipated for the main lanes of I-55 through the interchange area. If the main lanes were anticipated to operate at higher speeds, then ramp operations would be expected to become congested, due to a limitation in the number of acceptable gaps for merging into the flow of I-55 traffic.

For Alternative B, all proposed weaving areas are expected to operate at LOS C or better for both year 2012 and year 2032 conditions, except for the weaving area that will result in the southbound direction south of the proposed interchange. The proposed weaving area in the southbound direction between the proposed interchange and the existing McLemore Avenue Interchange is anticipated to operate at LOS D for morning conditions in the year 2032, but to operate at LOS E for afternoon conditions in the year 2032. This is primarily because this weaving area will be reduced in length.

Basic freeway operation north of the proposed interchange is anticipated to operate at LOS E in both directions for year 2032 conditions for both morning and afternoon peak conditions. This is primarily due to the limitations of the Memphis-Arkansas Bridge, with the narrow lanes and lack of shoulders, and is also due to the curvature of the existing I-55 roadway. Southbound I-55 is anticipated to operate at LOS E between the proposed interchange ramps in the southbound direction, for afternoon peak conditions in the year 2032.

Figure 2.4. Alternative B Interchange Layout (artist rendering) in Memphis, Tennessee.

Figure 2.5. Alternative B for the I-55 Interchange Project in Memphis, Tennessee.



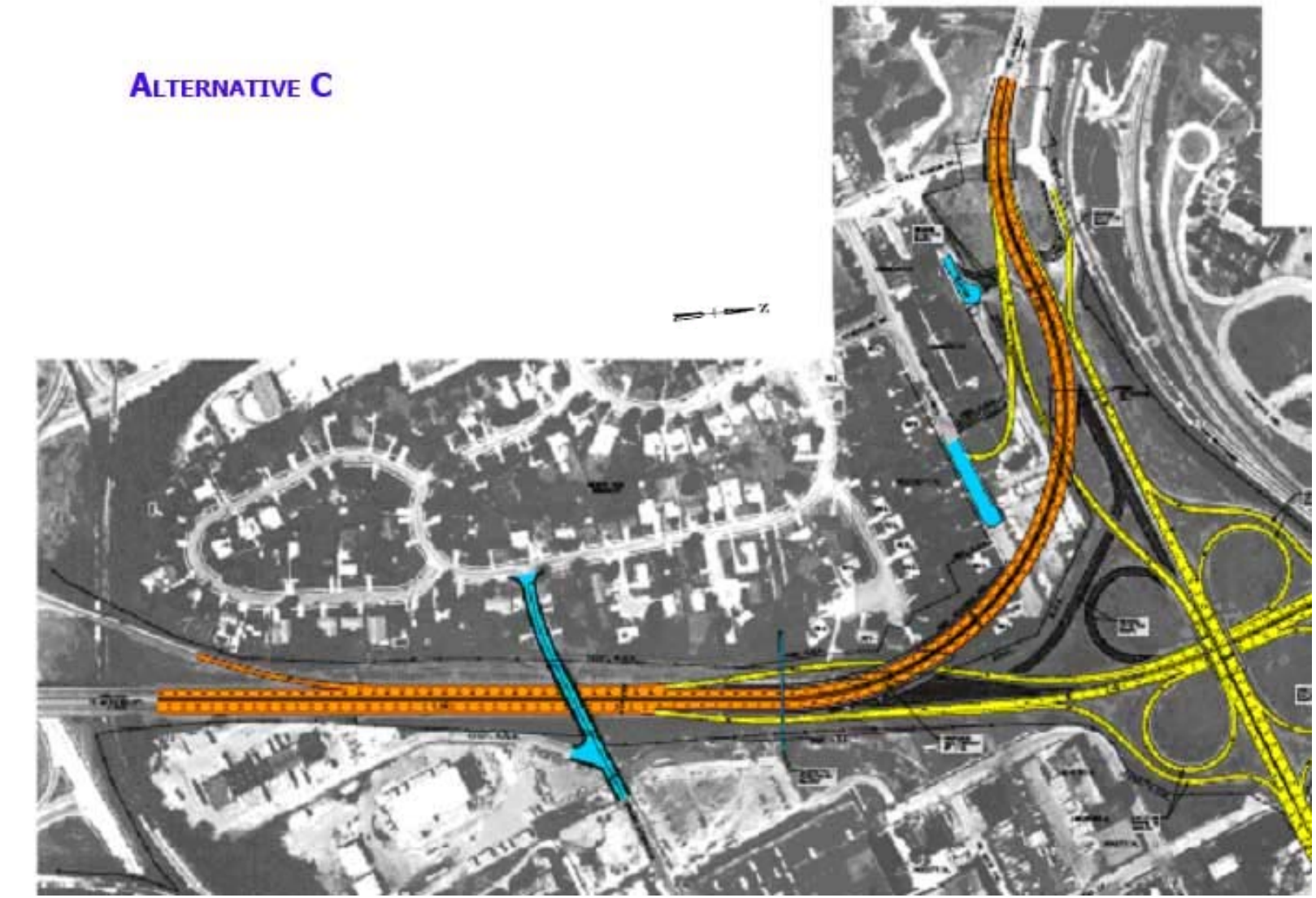
2.3 Alternatives Previously Considered and Eliminated from Further Consideration

This section contains a description of other potential design options or Build Alternatives that have been considered during past studies for this project, including the IMS. As mentioned under the description of the No-Build Alternative in Section 2.2.1, both TSM and TDM strategies were also considered, but were determined not to be capable of meeting the stated Purpose and Need of this project. Therefore those options would not substantially reduce congestion in the project area, improve safety, or establish improved interstate route continuity of the I-55 Interchange. The following previously considered alternatives were eliminated for various reasons as described below. The primary reasons they were not carried forward in the EIS is because they would have not met the Purpose and Need for the project due to inadequate design speeds or traffic flow and/or would have resulted in severe economic impacts.

2.3.1 Alternative C

Alternative C would have maintained the basic design of Alternative A and incorporated all of the proposed improvements as described in Alternative B with one minor modification. An exit ramp from southbound I-55 would have been added in order to provide access to the residential and commercial properties in the southwest quadrant. However, motorist would be required to exit the area using the I-55 and McLemore Avenue Interchange. Motorists in the southwest quadrant would not have direct access to eastbound E.H. Crump Boulevard as in Alternative B. Southbound Riverside Boulevard would not have access to eastbound E.H. Crump Boulevard. Because Alternative A or B incorporated the same basic design of Alternative C, but had additional access options, this alternative was recommended for elimination as a potential alternative to be carried forward for further study in the EIS. Figure 2.6 depicts the proposed layout of Alternative C.

Figure 2.6. Proposed Layout of Alternative C for the I-55 Interchange project in Memphis, Tennessee.



2.3.2 Alternative D

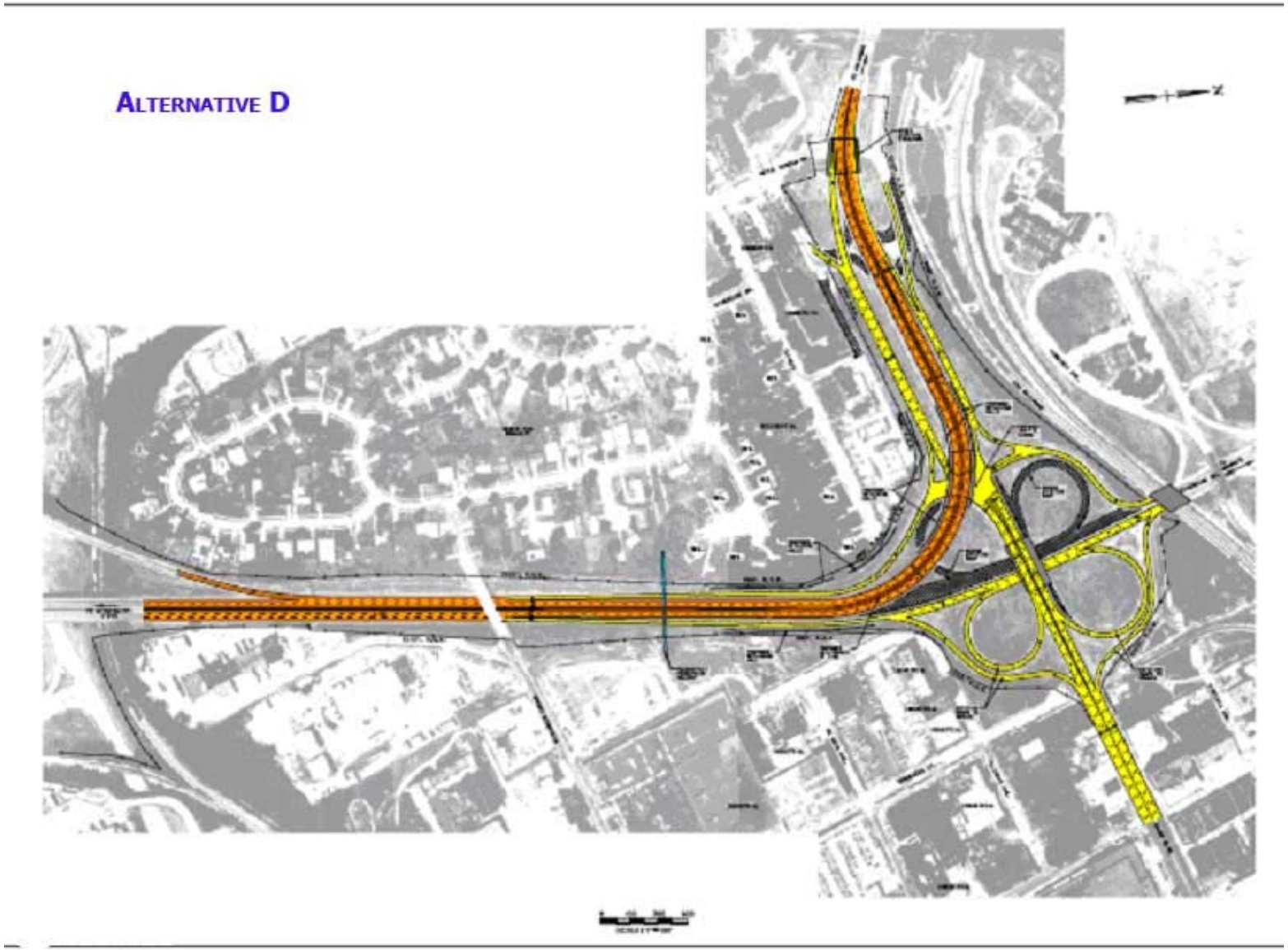
Alternative D incorporated design features that modified the design of Alternative A in order to reduce impacts in the southwest quadrant. The goals of this alternative were to eliminate the acquisition of any residential or commercial properties in the southwest quadrant, reduce the amount of additional right-of-way (ROW) required for the project, and eliminate cut-through traffic to and from I-55 in the southwest quadrant. Figure 2.7 and Figure 2.8 show the layout of Alternative D.

In order to minimize impacts in the southwest quadrant, the design radius for mainline I-55 had to be reduced. This resulted in a design speed of 45 mph, which would have required a design exception by the FHWA. The AASHTO document "A Policy on Geometric Design of Highways and Streets" outlines the criteria for urban freeways in Chapter 8 by stating, "… design speed should not be less than 80 km/hr (50 mph)." This design guide notes, "… higher design speeds are closely related to the overall quality and safety of a facility."

Grade changes would be required to I-55 to achieve adequate vertical clearances and retaining walls would be required to minimize acquisition of ROW. Due to the grade changes and the retaining walls, the length and width of the acceleration lane onto I-55 northbound from E.H. Crump Boulevard and South Riverside Boulevard would be less than desirable. Much of the existing infrastructure could remain but the loop ramp located in the southwest quadrant of the existing interchange would have been eliminated. Because of the reduced design speed and resulting lower LOS, this Alternative would not meet the stated Purpose and Need for this project and was not recommended to be carried forward for further evaluation in the EIS.

Figure 2.7. Alternative D Interchange Layout (artist rendering) for the I-55 Interchange in Memphis, Tennessee.

Figure 2.8. Proposed Layout of Alternative D for the I-55 Interchange project in Memphis, Tennessee.



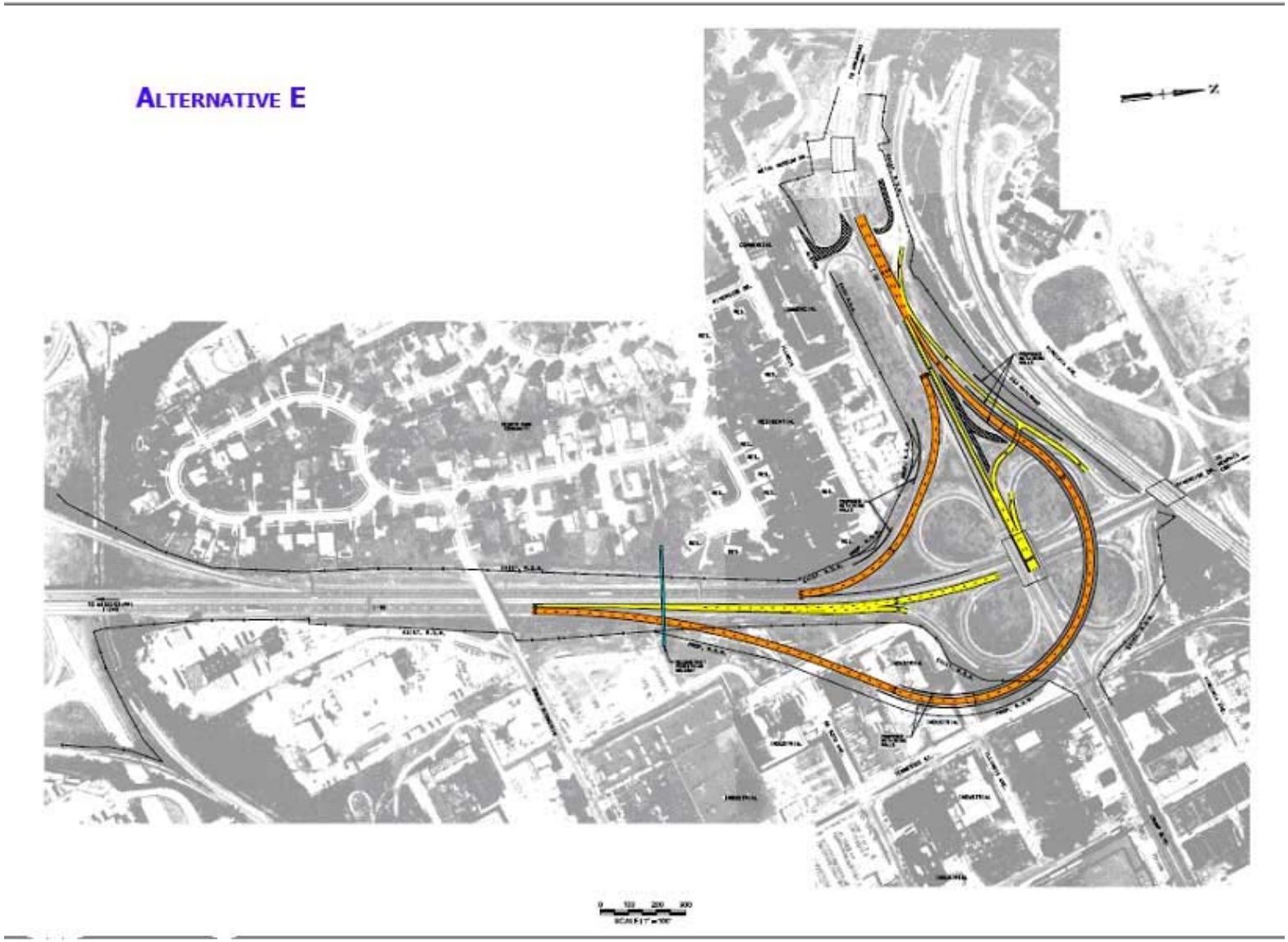
2.3.3 Alternative E

Alternative E would have consisted of constructing new lanes for northbound I-55 that shifted to the east of the existing I-55 just north of Wisconsin Avenue extending into an area developed in light and heavy industrial uses. The northbound lanes would cross over E.H. Crump Boulevard and turn tightly back to the west to re-join the existing I-55 lanes just west of the existing cloverleaf interchange and west of the existing entrance ramps from southbound South Riverside Boulevard onto westbound I-55. The southbound I-55 lanes would not be substantially improved as part of Alternative E causing this alternative to not be capable of meeting the stated Purpose and Need for the project. The layout of Alternative E is shown in Figure 2.9.

This alternative would avoid the acquisition of additional residential or commercial properties in the southwest quadrant, reduce the amount of additional ROW required for the project, and eliminate cut-through traffic to and from I-55 in the southwest quadrant. However, the design radius for mainline I-55 would be reduced or remain the same resulting in a design speed that would be less than the 50 mph speed mentioned in the AASHTO guidelines. The AASHTO document "A Policy on Geometric Design of Highways and Streets" outlines the criteria for urban freeways in Chapter 8 by stating, "… design speed should not be less than 80 km/hr (50 mph)." This design guide notes, "… higher design speeds are closely related to the overall quality and safety of a facility."

Because of the reduced design speed and resulting lower LOS, this Alternative would not meet the stated Purpose and Need for this project and was not recommended to be carried forward for further evaluation in the EIS.

Figure 2.9. Proposed Layout of Alternative E for the I-55 Interchange project in Memphis, Tennessee.



2.3.4 Alternative F

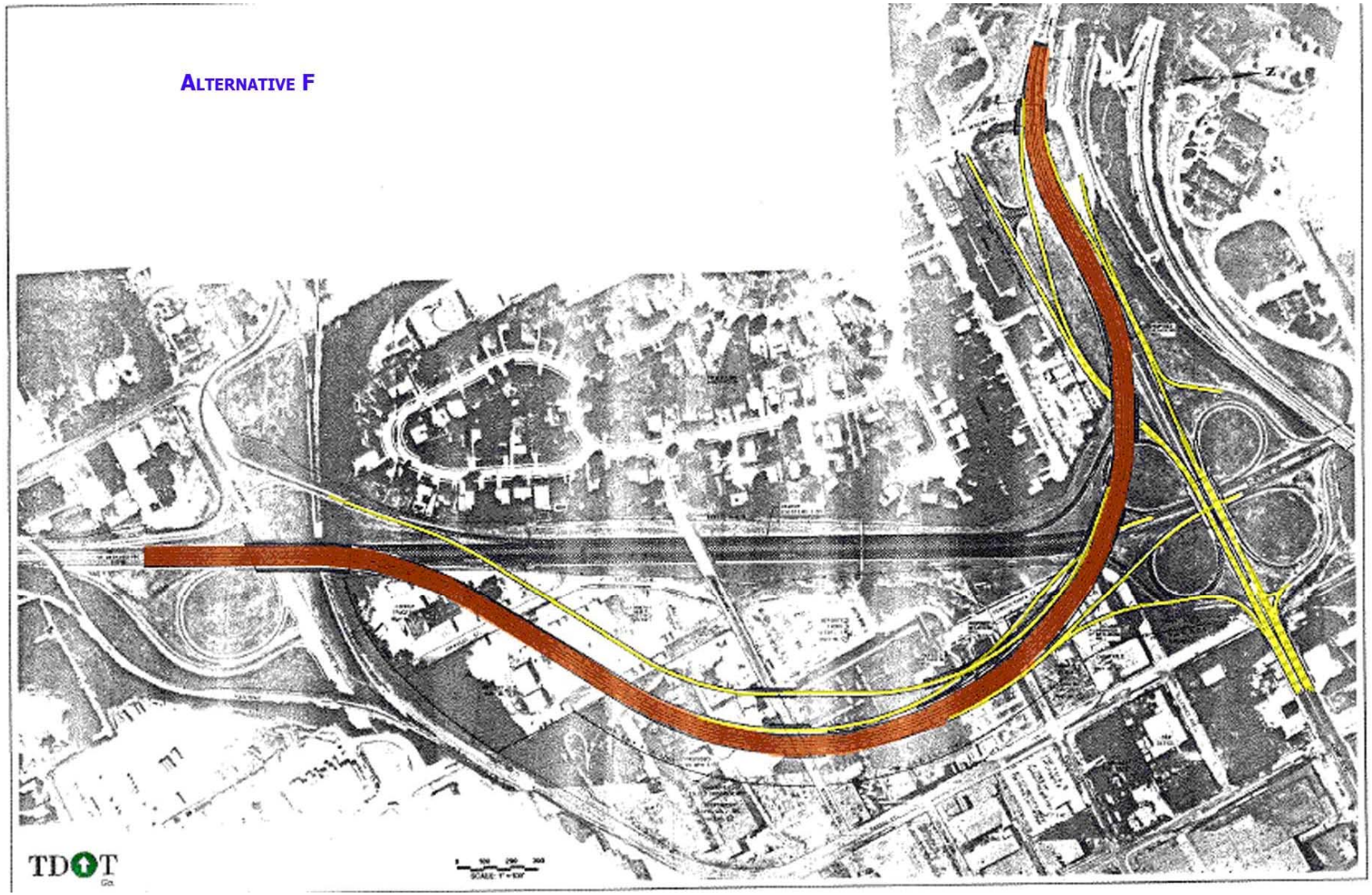
The proposed Alternative F would depart from the existing alignment by swinging south and east of the present I-55 Interchange at E.H. Crump Boulevard, extending into an area developed in light and heavy industrial uses as well as warehousing/transportation uses, and re-join the existing alignment around McLemore Avenue. Figure 2.10 shows the layout of Alternative F.

Data were collected from existing land users and from the City/County. Those data were analyzed using the Memphis/Shelby County Office of Economic Development (OED) model. That analysis determined that implementation of Alternate F would result in the loss of nearly 2,330 total jobs and slightly more than $212 million in annual negative economic effects in the Memphis and Shelby County community. After reviewing the economic literature on multipliers, it was determined that a more conservative approach could also be applied to the data. Consequently, the original OED model was modified by decreasing the multiplier used to calculate indirect employment. That second analysis demonstrated that implementation of Alternate F would result in the loss of 1,165 total jobs and $114 million in annual negative economic effects on the Memphis and Shelby County community. Following the conservative analysis the same collected and calculated data was applied to the Economic Impact Forecast System (EIFS) model, which forecasts economic situations differently than the techniques used by the OED but enables researchers to draw conclusions that are similar. That analysis using the EIFS model determined that implementation of Alternate F would result in the loss of nearly 1,032 total jobs and $98 million in annual negative economic effects on the Memphis and Shelby County community.

Comparison of the highest and lowest results of the several economic models enabled the establishment of the upper and lower limits of a range containing the effects of implementing Alternate F on the Memphis and Shelby County area. Using the EIFS model provided a lower boundary of 1,032 lost jobs and annual lost sales of $98 million while the analysis of the original OED model provided the upper boundary for maximum economic losses of 2,329 jobs and negative economic effects of $212 million annually.

Since it is impossible to determine future corporate policies with respect to relocation opportunities or to internal short-, mid-, and long-term corporate financial strategies, it was not known whether displaced businesses would be willing or capable of relocating in the Memphis area or in the State of Tennessee in general. Thus, Memphis, Shelby County, and the State could potentially be subjected to the full negative consequences of those job and annual economic losses, which would fall into a range of from 1,032 to 2,329 lost jobs, annual lost payrolls from $39 million to $77 million, and total annual economic losses ranging from $98 million to $212 million. If displaced businesses did relocate elsewhere, the number of lost jobs and annual negative economic effects would be very substantial. Also, in both cases it must be emphasized that the total negative economic effects are annual in nature and therefore would reoccur every year. Consequently, any analysis of total economic effects of implementing Alternate F on the Memphis and Shelby County area must take those reoccurring, annual losses into account. Because of the potential severe economic impacts associated with Alternative F, it was not recommended that the alternative be carried forward for further study in the EIS.

Figure 2.10. Proposed Layout of Alternative F for the I-55 Interchange project in Memphis, Tennessee.



2.3.5 Alternative G

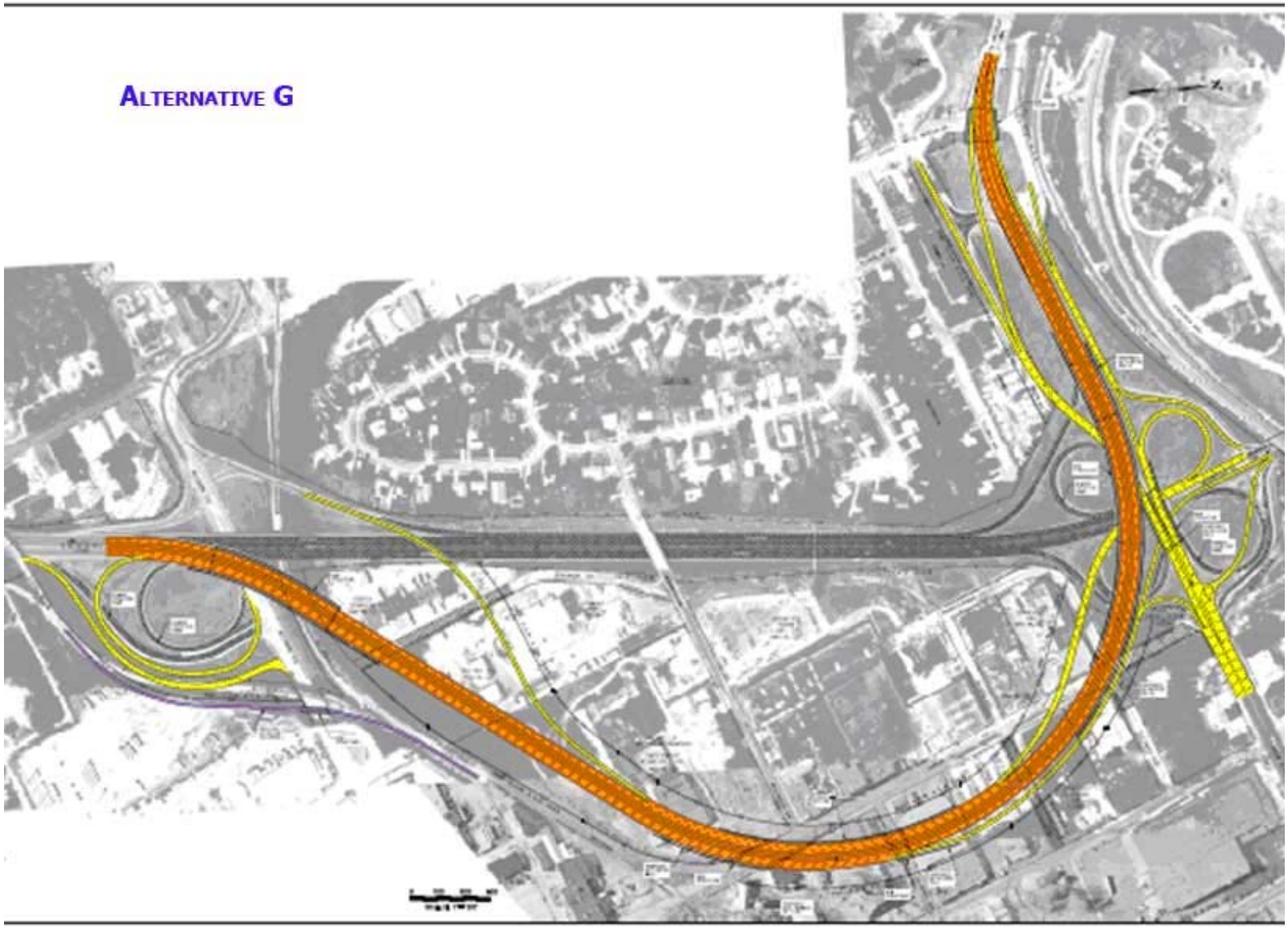
The proposed Alternative G would depart from the existing alignment by transecting the southern part of the present I-55 Interchange at E.H. Crump Boulevard, extending eastward into an area developed in light and heavy industrial uses as well as warehousing/transportation uses, and re-join the existing alignment slightly south of McLemore Avenue. Figure 2.11 shows the layout of the Alternative G.

Implementation of Alternative G would have resulted in the relocation of several additional existing businesses, including G & W Diesel, Leaf, Inc.; IBT Terminal; and Cooper Trucking. Alternative G of the I-55 at E.H. Crump Boulevard realignment, as proposed, would critically affect the operation and economic viability of the Hershey Foods plant. Implementation of Alternative G would remove the existing railroad service to the plant, which is now the primary means of delivering raw products used in the manufacturing process. Replacing raw product delivery via rail service with truck delivery of all raw materials is a non-feasible alternative since economies of scale and time/labor savings that currently are a direct result of rail service could not be achieved by means of truck delivery. Even if the economies of scale and time/labor savings were achievable through truck delivery, Alternative G would increase incoming truck traffic to Hershey Foods by more than 1,100 trucks annually in an area characterized by narrow streets and intersections with inadequate turning radii.

Implementation of Alternative G would also remove the existing Hershey Foods truck shipment staging area, and therefore disrupt its internal manufacturing operations, which are directly related to product flow originating from that staging area and moving through the plant. The anticipated three-year construction period of Alternative G would also negatively affect the manufacturing process to the point that plant operations may have to be suspended for many months if not for the entire construction period.

Since it is impossible to determine future corporate policies with respect to relocation opportunities or to internal short-, mid-, and long-term corporate financial strategies, it is not known whether displaced businesses would be willing or capable of relocating in the Memphis area or in the State of Tennessee in general. Thus, Memphis, Shelby County, and the State could potentially be subjected to the full negative consequences of those job and annual economic losses, which would fall into a range of from 1,032 to 2,329 lost jobs, annual lost payrolls from $39 million to $77 million, and total annual economic losses ranging from $98 million to $212 million. If displaced businesses did relocate elsewhere, the number of lost jobs and annual negative economic effects would be very substantial. Also, it must be emphasized that the total negative economic effects are annual in nature and therefore would reoccur every year. Consequently, any analysis of total economic effects of implementing Alternate G on the Memphis and Shelby County area must take those reoccurring, annual losses into account. Because of the potential severe economic impacts associated with Alternative G, it was not recommended that the alternative be carried forward for further study in the EIS.

Figure 2.11. Proposed Layout of Alternative G for the I-55 Interchange project in Memphis, Tennessee.



2.4 Build Alternative (Alternatives A and B) Levels of Service

Each of the proposed Build Alternatives is configured to make the main lanes of I-55 fly over the existing roadway connection to E.H. Crump Boulevard and South Riverside Boulevard so that the mainline I-55 traffic is not forced to use the existing cloverleaf interchange. The Build Alternatives make use of portions of the existing cloverleaf to provide connections to E.H. Crump Boulevard and/or South Riverside Boulevard. Detailed maps of the Levels of Service (LOS) of the proposed Build Alternatives and the interchanges are contained in Appendix A of the EIS.

For the Build Alternatives, the flyover bridges for the main lanes of I-55 are configured with a design speed of 50 mph. It is expected that the typical running speed through these curves will be approximately 55 mph. This will result in some congestion on the main lanes, but substantially less than experienced with the existing conditions. The reduced mainline travel speed will also make weaving, merging, and diverging activities easier to accomplish, so that the ramp junctions for the proposed Build Alternatives are anticipated to have acceptable LOS. The number of weaving areas is greatly reduced for the Build Alternatives, and the operating character of the proposed weaving areas is substantially better than No-Build conditions.

In general, all weave areas, ramps, and freeway portions of I-55 within the project area would operate at LOS D or better in 2012 and LOS E or better in 2032. This would provide modest improvement to the already poor LOS F conditions that occur at the present time. The LOS on I-55 could likely be even better than LOS E in 2032 under the proposed Build Alternatives if other portions or features of I-55 were improved under subsequent projects. For instance, the existing narrow lanes and lack of shoulders on the Memphis-Arkansas Bridge over the Mississippi River and the curvature of the existing I-55 roadway result in decreased LOS. Additional traffic lanes in each direction, increased design speeds, or increased shoulder widths would all have potential to improve LOS in addition to the proposed I-55 Interchange improvements at E.H. Crump Boulevard and South Riverside Boulevard discussed in this EIS.

Improving the I-55 Interchange as proposed under any of the proposed Build Alternatives would provide a logical freeway facility that connects portions of I-55 located west of Memphis to portions of I-55 south of Memphis. The proposed interchange improvements would reduce congestion, reduce crashes, restore interstate continuity, and would not restrict consideration of alternatives of other reasonably foreseeable transportation improvements.

CHAPTER 3

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter of the I-55 Interchange EIS will describe the social, economic, cultural, and natural resources in the project vicinity (affected environment), followed by a discussion of the potential impacts (environmental consequences) that this project may have on those resources. Following the discussion of environmental consequences, mitigation measures are discussed to explain what efforts have been or would be taken to avoid, minimize, and/or mitigate for environmental consequences resulting from this project.

Direct, indirect, and cumulative impacts anticipated to occur with implementation of this project are discussed by alternative under each resource category. In addition, a summary matrix is provided at the end of the chapter to allow for side-by-side comparison of the primary impacts associated with each alternative being considered. A separate summary of cumulative impacts is provided at the end of the chapter to describe the potential impacts the project may have on various resources as a whole, when considered in combination with all other past, present, and reasonably foreseeable projects or actions that have affected or could potentially affect the same resources.

3.1 Affected Environment

The affected environment portion of this chapter describes the existing natural, cultural, social, and economic environments occurring within the proposed project area. The affected environment results from all past and present actions in the project area. The affected environment descriptions serve to establish baseline conditions of each resource against which to evaluate anticipated environmental consequences that could result from the proposed project. The affected environment is described by resource category either in general or by subcategory where appropriate.

The following resource categories were determined to be appropriate for this study and are consistent with the general guidelines set forth by the FHWA (FHWA, 1987):

- **Social/Community and Economic Resources including**:
    - Land Use and Infrastructure;
    - Social Environment and Community Resources, including:
        - Environmental Justice and Non-discrimination,
        - Displacements and Relocations,
        - Neighborhood and Community Cohesion,
        - Travel Efficiency,
        - Public Services,
        - Considerations Related to Pedestrians and Bicyclists, and
        - Visual Quality.
    - Economic Environment; and
    - Farmland.
- Ecological Resources including:
    - Aquatic Resources (Streams, Waterbodies, and Water Quality);
    - Wetlands;

- Floodplains;
- Threatened and Endangered Species; and
- Fish and Wildlife/Habitats.

➲ Cultural Resources impacts including:

- Archaeological Resources; and
- Historical/Architectural Resources;

➲ Air Quality;

➲ Noise;

➲ Hazardous Materials;

➲ Energy;

➲ Section 4(f) Properties; and

➲ Construction.

As discussed in Chapter 2, potential implementation alternatives being considered in the environmental consequences section of this EIS include the following:

- **No-Build Alternative.**
- **Alternative A** - Alternative A consists of proposed modifications to the I-55 Interchange near E.H. Crump Boulevard that will improve traffic movements along and between the I-55 and McLemore Interchange and the Mississippi River Bridge.
- **Alternative B** - Alternative B maintains the basic design as Alternative A but incorporates modifications to address concerns over continuity for southbound I-55 motorists wishing to access E.H. Crump Boulevard immediately after crossing the Mississippi River.

3.2 Impacts Analysis

As mentioned above, the environmental consequences (here forth referred to as impacts) associated with this project will be described immediately following the affected environment descriptions for each resource category. Three types of impacts will be considered including direct, indirect, and cumulative impacts. The various types of impacts are defined in the following sections.

The study area for direct impacts for most natural resources, noise, and physical environment studied in the EIS included the 500-foot study corridor surrounding the centerlines of the proposed alternatives. Some of the other resources were studied at larger scales using boundaries that fit the context of the individual resource being studied. For instance, social resources were studied within the affected census tracts that the Build Alternatives fall within; economic resources and air quality were studied within the boundaries of Shelby County; and land use was looked at based on the most likely areas to be affected due to the improved access/transportation facilities provided by the improved I-55 Interchange. That area was determined to be an area bound by the CSX Railroad to the north, the Mississippi River to the west, Kentucky Street to the east, and McLemore Avenue to the south. Beyond that area, it is less likely that the improved interchange would have a substantial affect on land use when compared to the No-Build conditions. Finally some resources, such as threatened and endangered species and hazardous materials were studied using a one-mile radius surrounding the Build Alternative alignments. Figure 3.1 displays the various study area boundaries used for this project.

3.2.1 Direct Impacts

A direct impact is caused by the proposed action and occurs at the same time and place. A resource must be present in a particular area for a direct impact to occur. For example, construction of a new roadway may result in displacement of an existing residence located in the construction zone that could not be avoided. The occupants of the residence would be forced to relocate to another residence, preferably in the same general vicinity. This would be considered a direct impact to those residents.

3.2.2 Indirect Impacts

The basic concepts discussed in the National Cooperative Highway Research Program (NCHRP) Report 466 "Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects" were used during the indirect impacts analyses. An indirect impact is caused by the proposed action and occurs later in time or is farther removed in distance but is still reasonably foreseeable. For example, the occupants of the residence described under the direct impacts discussion above would need to be relocated. The new residence may be a comparable home that may be for sale in the project vicinity or a new home may be constructed on available property within the vicinity. If an existing home in the market is suitable, there would likely be minimal potential for additional impacts to the environment to occur due to the residence relocating. However, if a new home is required to be built to provide comparable or suitable housing for the displaced resident, construction of the home may result in additional, reasonably foreseeable impacts. For instance, the new home may be constructed near an existing stream in the project vicinity that was avoided by the construction of the new roadway. Construction of the new home may result in sediment laden runoff from the home construction site entering the stream, reducing water quality and adversely impacting aquatic habitats. The impacts caused by the construction of the new home would be considered indirect impacts of the roadway project, because if it were not for the roadway forcing the residents to relocate, the impacts to the stream would not have occurred. Even though the stream was not directly impacted by the roadway construction activities, the adverse impacts to the stream were ultimately due to the roadway.

3.2.3 Cumulative Impacts

The cumulative impact analysis evaluates the direct and the indirect effects of implementing any of the study alternatives in association with past, present, and reasonably foreseeable future actions of other parties in the surrounding area (where applicable). The cumulative impacts analysis considers all potential impacts to various resources as a whole. The past, present, and reasonably foreseeable projects considered in the cumulative impacts analyses may or may not be related to the proposed action.

The CEQ has outlined a framework for incorporating cumulative effects analyses into the environmental impact statement process. The framework includes the following points:

1) **Cumulative effects are caused by the aggregate of past, present, and reasonably foreseeable future actions.** The effects of a proposed action on a given resource, ecosystem, and human community include the present and future effects added to the effects that have taken place in the past. Such cumulative effects must also be added to effects (past, present, and future) caused by all other actions that affect the same resource.

2) **Cumulative effects are the total effect, including both direct and indirect effects, on a given resource, ecosystem, and human community of all actions taken, no matter who (Federal, non-Federal, or private) has taken the actions.** Individual effects from disparate activities may add up or interact to cause additional effects not apparent when looking at the individual effects one at a time. The additional effects contributed by actions unrelated to the proposed action must be included in the analysis of cumulative effects. However, if the proposed action has no direct

or indirect effects on a given resource then there would be no potential for cumulative effects associated with the action. For instance, if a Build Alternative is selected but no impacts to wetlands occur, then the project would not contribute to cumulative impacts to wetlands that may be caused by other unrelated projects in the area. Although the cumulative impacts of those other unrelated projects should still be mentioned under the No-Build Alternative because those impacts would occur even if the proposed action is not implemented.

3) **Cumulative effects need to be analyzed in terms of the specific resource, ecosystem, and human community being affected.** Environmental effects are often evaluated from the perspective of the proposed action. Analyzing cumulative effects requires focusing on the resource, ecosystem, and human community that may be affected and developing an adequate understanding of how the resources are susceptible to effects.

4) **It is not practical to analyze the cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful.** For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited through scoping to effects that can be evaluated meaningfully. The boundaries for evaluating cumulative effects should be expanded to the point at which the resource is no longer affected significantly or the effects are no longer of interest to affected parties.

5) **Cumulative effects on a given resource, ecosystem, and human community are rarely aligned with political or administrative boundaries.** Resources typically are demarcated according to agency responsibilities, watershed boundaries, county lines, or other administrative boundaries. Because natural and socio-cultural resources are not usually so aligned, each political entity actually manages only a piece of the affected resource or ecosystem. Cumulative effects analysis on natural systems must use natural ecological boundaries and analysis of human communities must use actual socio-cultural boundaries to ensure including all effects.

6) **Cumulative effects may result from the accumulation of similar effects or the synergistic interaction of different effects.** Repeated actions may cause effects to build up through simple addition (more and more of the same type of effect), and the same or different actions may produce effects that interact to produce cumulative effects greater than the sum of the effects.

7) **Cumulative effects may last for many years beyond the life of the action that caused the effects.** Some actions cause damage lasting far longer than the life of the action itself (e.g., acid mine drainage, radioactive waste contamination, species extinctions). Cumulative effects analysis needs to apply the best science and forecasting techniques to assess potential catastrophic consequences in the future.

8) **Each affected resource, ecosystem, and human community must be analyzed in terms of its capacity to accommodate additional effects, based on its own time and space parameters.** Analysts tend to think in terms of how the resource, ecosystem, and human community will be modified given the action's development needs. The most effective cumulative effects analysis focuses on what is needed to ensure long-term productivity or sustainability of the resource (CEQ 1997).

The cumulative impact analysis has been prepared at a level of detail that is reasonable and appropriate to support an informed decision in selecting a preferred alternative. The cumulative impact discussion is presented according to each of the alternatives listed.

3.2.3.1 Definitions Used in Cumulative Analysis

This Section defines several key terms used in the cumulative impact analysis.

Cumulative Impact Analysis Area

The cumulative impact analysis area includes that area that has the potential to be affected by implementation of any of the Alternatives. The indirect impact analysis area was the same as the cumulative impacts analysis area for this project. The boundaries of the indirect impact and cumulative impact study areas varied according to the resource being considered. For most resource categories, the indirect and cumulative impacts analyses extended beyond the 500-foot study corridor used to determine direct impacts for several resources. For those categories, the cumulative and indirect impact analysis area was set based on the context of the resource. In general, the potential for the I-55 Interchange project to influence those resources, either through induced development or by affecting the same resources as other past, present, or reasonably foreseeable projects or actions in the area, was considered based on the best available information prior to initiating the study. The boundaries of the cumulative and indirect impact analysis area are described for each resource category are identified in Table 3.1 and are depicted in Figure 3.1.

Figure 3.1. Study area boundaries used for the I-55 Interchange EIS in Memphis, Tennessee.

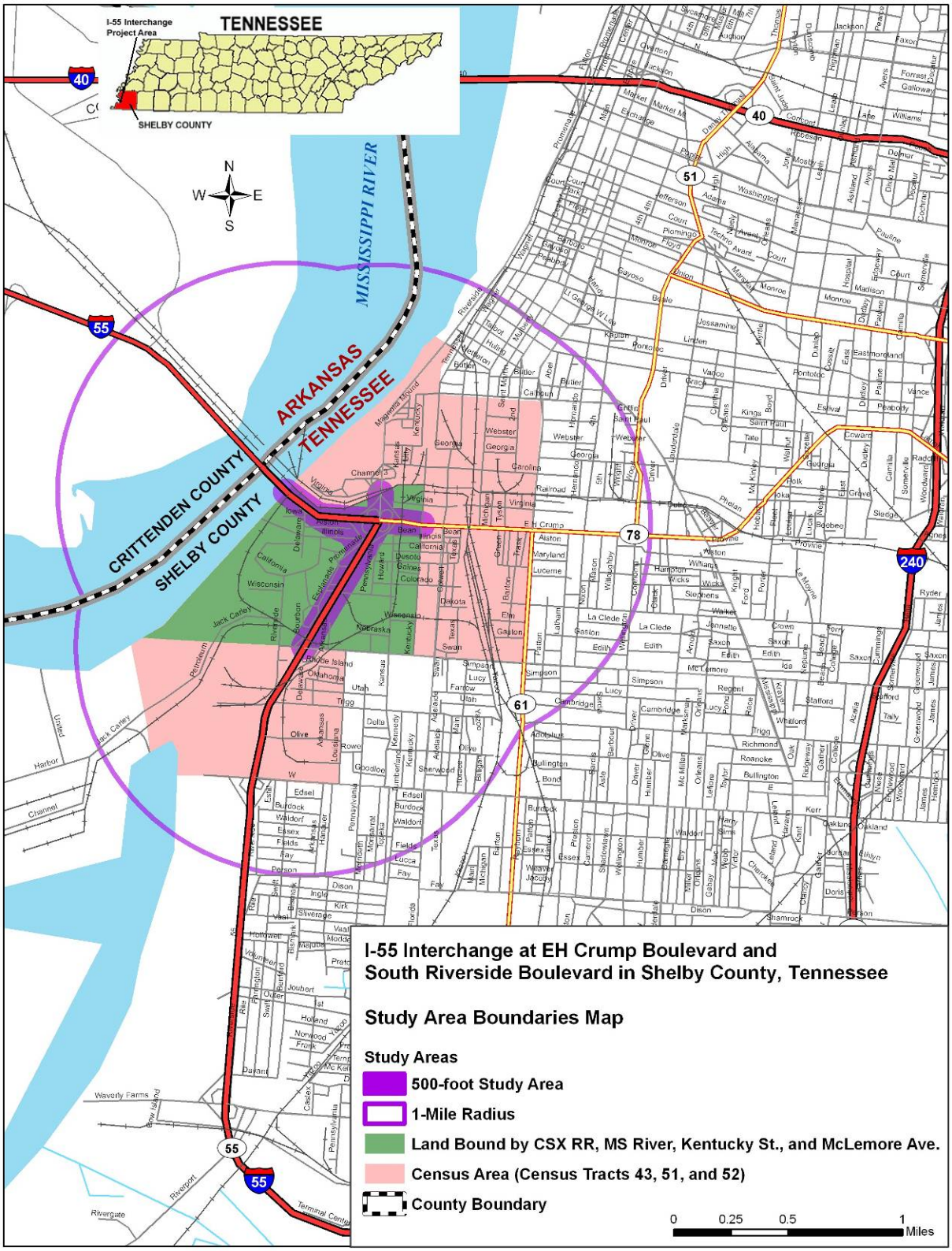


Table 3.1. Study area for each resource category considered in the indirect and cumulative impacts analysis for the I-55 Interchange EIS in Memphis, Shelby County, Tennessee.

Resource Category	Analysis Area
Land Use and Infrastructure	Land bounded by the Mississippi River to the west, the CSX railroad line to the north, Kentucky Street to the East, and McLemore Avenue to the South.
Farmland, Soils, and Physical Environment	Land bounded by the Mississippi River to the west, the CSX railroad line to the north, Kentucky Street to the East, and McLemore Avenue to the South.
Social Environment	Census Block Group 1 in Tracts 43, 51, and 52.
Relocation	Land bounded by the Mississippi River to the west, the CSX railroad line to the north, Kentucky Street to the East, and McLemore Avenue to the South.
Economics	Shelby County, Tennessee
Air Quality	Shelby County, Tennessee
Noise	Land bounded by the Mississippi River to the west, the CSX railroad line to the north, Kentucky Street to the East, and McLemore Avenue to the South.
Water Quality	All watersheds or waterbodies present in the area bounded by, and including, the Mississippi River to the west, the CSX railroad line to the north, Kentucky Street to the East, and McLemore Avenue to the South. This would include any watercourses where stormwater runoff from the project area is discharged.
Wetlands	All wetlands present in the area bounded by the Mississippi River to the west, the CSX railroad line to the north, Kentucky Street to the East, and McLemore Avenue to the South.
Water Body Modifications and Wildlife	Land bounded by the Mississippi River to the west, the CSX railroad line to the north, Kentucky Street to the East, and McLemore Avenue to the South.
Floodplains	Since there would be no direct or indirect impacts to floodplains from the I-55 Interchange project, no cumulative floodplain impacts would occur, and no analysis area is defined.
Threatened and Endangered Species	All potential threatened and endangered species and any terrestrial habitats within a 1-mile radius and aquatic habitats within 4 miles downstream of the proposed construction zone that are considered potential habitat for those species.
Cultural Resources	The combined areas of both the A and B Alternatives [the Area of Potential Effect (APE)], including vacant properties proposed to be used for relocating displaced residences. The view shed analysis was made from areas within a one-mile radius of the APE.
Hazardous Waste Sites	All hazardous materials within one mile of Alternative A and

Resource Category	Analysis Area
	Alternative B.
Visual	The view shed analysis was made from areas within a one-mile radius of Alternative A and Alternative B.
Energy	Shelby County, Tennessee
Source: Parsons, 2008	

Impact Evaluation Criteria

Impact evaluation criteria are used to define or identify the level of effect that could result in an impact to the resource being considered. Impact evaluation criteria vary by resource category. Therefore, the introductory section for each resource category defines evaluation criteria that were considered, where applicable. Both the context and severity of potential impacts were evaluated. Impacts were considered in both short-term and long-term timeframes since the proposed action would have potential to have immediate impacts due to construction activities and other impacts that may be evident well into the future.

Past Actions

Past actions are defined as actions within the cumulative impact analysis area that occurred before the EIS was initiated. These include past actions in the project area, and past demographic, land use, and development trends in the areas that surround the project area. In most cases, the characteristics and results of these past actions comprise the existing conditions that are included in the discussions of each of the resource categories.

Present Actions

Present actions include all existing or current activities, resource management programs, land uses, and development projects that are being implemented by local, state, or Federal governments and/or the private sector (where they can be identified) within the cumulative impact analysis areas.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions may include those actions in the planning, budgeting, or execution phases. Actions may be those of the Federal government, state or local government, or private organizations or individuals. Secondary or induced developments associated with projects such as new or improved roadways or interchanges that provide access to otherwise less accessible areas can also be considered reasonably foreseeable even though no plans or budgets have been created. Such developments would be reasonably foreseeable in those instances primarily based on past trends associated with similar transportation projects. Reasonably foreseeable developments often associated with new or improved access points may include highway-oriented businesses, such as gas stations, fast-food restaurants, and hotels and sometimes industrial or commercial/retail developments. Local zoning ordinances, land use plans, interviews with local officials, and other references are used to help determine what reasonably foreseeable developments are anticipated in the general project area.

3.2.3.2 Past, Present, and Reasonably Foreseeable Future Actions in the I-55 Interchange Project Area

The primary past and present actions that have occurred both within and adjacent to the project area that have been considered in the analysis of cumulative impacts are identified below. These actions are grouped in one discussion, as together they have resulted in the existing conditions of the

surrounding area. A summary list of past and present actions within and around the project area that have the potential to impact the wide range of resource issues being considered in this cumulative impact analysis is provided in the following section. Existing conditions are discussed in the affected environment description for each of the resources assessed in this document.

Past and present actions that have resulted in the existing conditions of the project vicinity include the following:

- Construction of the existing transportation infrastructure, including I-55, South Riverside Boulevard, and E.H. Crump Boulevard;
- Construction of the French Fort neighborhood and associated local access roads within the western project area limits;
- Construction and operation of commercial and industrial businesses and associated access roads and parking lots within the project area;
- Ongoing projects in the South Central Business Improvement District (CBID) and Gateway Commercial District, which lie immediately north/northeast of the I-55 Interchange project area. The developments mixed uses consisting of new and renovated high density, multi-family residential, office, retail, commercial, and institutional properties on both sides of E.H. Crump Boulevard. Much of this area was formerly an industrial area;
- Construction of Phase 1 of the I-40/I-240 East Interchange on the east side of Memphis;
- Implementation of the I-240 widening project to add one lane in each direction along I-240 from the I-240/I-55 Interchange north to the Midtown Interchange (I-240/I-40);
- Renovations to the I-40/I-240 Midtown Interchange. This project was developed to improve safety and traffic flow in this area, where numerous crashes had occurred over the past two decades, including fatal crashes. This massive investment by the state ended speculation that I-40 would be built through Overton Park, as was proposed in the 1960s;
- Walnut Grove Road. This project includes widening and raising a bridge over I-240, widening Walnut Grove between the interstate and the Wolf River, replacing the at-grade Humphreys intersection with a Single Point Urban Interchange, and building three new bridges over the Wolf River to replace the current structure. This project is currently under construction;
- Memphis Area Transit Authority light rail expansion; and
- Implementation of the TDOT SmartWay (intelligent transportation system) advanced information technologies including efforts to include:
    - Roadway Traffic Sensors to report traffic counts, speed, and travel time;
    - Camera Video Surveillance to monitor congested freeways and provide improved incident management capabilities;
    - Dynamic Message Signs to provide traffic and construction information to motorists, as well as provide information on Amber Alerts;
    - HELP Freeway Service Patrols to reduce congestion by removing minor incidents in a timely fashion;
    - Transportation Management Centers (TMC) which serve as a focal point for traffic management operations and communications;

- Incident Management to detect, verify, and respond to incidents in an efficient manner and manage traffic conditions around the incident site;
- Construction Information that is provided to advise motorists traveling through construction sites;
- TDOT Smartway Information System (TSIS) is a system communicating data from TDOT SmartWay devices to a central location and distributing that transportation information to motorists and other interested parties before and while making trips. Information is distributed via TDOT's Web site and through the media. TDOT also launched the Tennessee 511 component of this system; and
- Information on Weather-Related Road Conditions, a new component of SmartWay, was introduced in December 2005. This feature allows TDOT to show travelers where problems may exist on any state road due to weather conditions such as snow, ice and flooding. A simple click of the mouse will highlight any areas to be avoided due to hazardous road conditions.

The primary reasonably foreseeable future actions that have been considered for cumulative impacts are listed in Table 3.2. The listing includes relevant foreseeable actions within and adjacent to the project area including other Federal Government agencies, state and local agencies, as well as private and commercial entities where information was known.

Table 3.2. Primary reasonably foreseeable future projects considered as part of the Cumulative Impacts Analysis for the I-55 Interchange Project EIS.

Reasonably Foreseeable Future Project	Location	Resource(s) potentially impacted*
Memphis Riverfront Development Plan	Memphis Riverfront	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
Memphis Medical District Development Plan	Directly East of Downtown Core	Land use and infrastructure; soils, and physical environment; social environment; relocation; economics; air quality; noise; water quality; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
Mixed Use development in the areas formerly used as an industrial and warehousing district in the South End area. This area is evolving into a mixed-use neighborhood with a booming residential market. Recently, over $240 million in new development was announced in the South End. Estimates predict that this area will soon be home to more than 5,000 new residents.	South end of downtown Memphis, just northeast of the proposed I-55 Interchange improvement project.	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
Residential development in the Bluffview Residential District north of those commercial uses between Kansas Street and Texas Street. Uses in that District are focused on the retention and reuse of historic warehouse structures and the historic elements associated with them while encouraging new architecturally compatible new development with public infrastructure and amenities that will create an attractive and comfortable environment.	South end of downtown Memphis, just northeast of the proposed I-55 Interchange improvement project.	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
A new fire station planned for the Riverside Residential District on Channel 3 Drive to serve the needs of the South CBID as well as those of the Project area.	South end of downtown Memphis, just north of the proposed I-55 Interchange improvement project.	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
Additional residential uses are proposed in the South Downtown Residential District	South end of downtown	Land use and infrastructure; soils, and physical environment; social

Reasonably Foreseeable Future Project	Location	Resource(s) potentially impacted*
south of E.H. Crump Boulevard from Third Street to South Danny Thomas Boulevard. That District is intended to permit the development of low to moderate income housing in pedestrian-friendly neighborhoods with some subordinate mixture of local commercial and retail activities.	Memphis, just north of the proposed I-55 Interchange improvement project.	environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
Phase II of the I-40/I-240 East Interchange. Provides for the separation of through traffic from traffic using the ramps to I-40 and Sam Cooper Boulevard.	East of downtown Memphis	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
Renovations to the I-40/I- 240 Midtown Interchange. Provides improved safety and traffic flow in this area, where numerous crashes have occurred over the last two decades.	Midtown at I-40/I-240 Interchange	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
Interstate 69 (Corridor 18). This project was designated by Congress as a High Priority Corridor of National Significance. This project has been described as a "North American trade route," an "international trade route," and a "NAFTA corridor." The purpose of this project is to improve international and Interstate trade in accordance with national and state goals; to facilitate economic development in accordance with state, regional, and local policies, plans, and surface transportation.	Running in a general north/south direction through downtown Memphis and an extra route east of Memphis (System Approach).	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
I-55/Mallory Avenue Interchange Modification. This project would enhance access to the proposed Super Terminal and provide additional lanes along mainline I-55 through the interchange area.	Located in southwest Memphis, two interchanges south of the proposed endpoint of the I-55 Interchange project area.	Land use and infrastructure; soils, and physical environment; social environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
Extending South Parkway West to Jack Carley Causeway on Presidents Island.	Located in Southwest	Land use and infrastructure; soils, and physical environment; social

Reasonably Foreseeable Future Project	Location	Resource(s) potentially impacted*
	Memphis, southwest of the I-55 Interchange project.	environment; economics; air quality; noise; water quality; wetlands; water body modifications and wildlife; floodplains; threatened and endangered species; cultural resources; hazardous waste sites; visual impacts; and energy.
Implementation of additional phases of TDOT SmartWay (intelligent transportation system) advanced information technologies in the Memphis area.	Along major roadways within and surrounding downtown Memphis including I-55 within the project area.	Infrastructure; social environment; economics; air quality; noise; cultural resources; visual impacts; and energy.
* A resource "potentially impacted" does not imply that this resource exists or would be directly or indirectly impacted by the project. Please refer to the various resource categories for the specific Cumulative Impacts Analysis.		

3.3 Land Use and Infrastructure

3.3.1 Affected Environment

3.3.1.1 Existing Conditions and Trends

Both Alternative A and Alternative B traverse fully developed urban areas, following fairly closely the existing alignment of I-55, with the primary exception of the intersection with E.H. Crump Boulevard. The French Fort neighborhood, a middle-class neighborhood of single-family residential houses on modest lots developed as part of an urban renewal project in the 1960s, is located west of I-55 in the project area. Named for a fort built nearby in 1739, French Fort contains nearly 150 homes and was one of the first middle-class African-American neighborhoods in the city.

Separating the northern portion of the French Fort neighborhood from I-55 are two parks, two parcels of vacant land now used as open space, the National Ornamental Metal Museum, and a limited strip of commercial uses, including a hotel-motel, offices, a vacant mid-rise motel, and a recreational vehicle park. Light and heavy industrial uses lie to the east of I-55 and include candy manufacturing (Hershey Foods), diesel motor sales and repair facilities, trucking and warehousing, and other light manufacturing facilities.

North of the interchange is the South Central Business Improvement District (South CBID), an area bordering Downtown that is undergoing extensive public-private renewal and investment largely driven by single- and multiple-family residential development and some associated mixed commercial-retail-office uses that are related to the recent and ongoing Downtown revitalization effort. The successful residential development in the South CBID has generated considerable interest in properties immediately south of I-55 in the study area, and they have the potential to be converted to multi-family residential and a variety of residential-related uses.

The project vicinity contains several parks and other sites of interest. Martyr Park lies northwest of the proposed project area, outside of the proposed ROW. It is a small area dedicated to Memphis citizens affected by the yellow fever epidemic of 1870. The park overlooks the Mississippi river and contains a commemorative statue for the citizens and caregivers affected by the outbreak. Other than

the statue and the view, Martyr's Park features only a small parking lot and a sidewalk leading to the statue. Renovations are currently underway to add an illuminated walkway that will eventually connect the area to the Memphis Riverwalk at Mud Island.

E.H. Crump Park lies outside the proposed project right-of-way. It consists of a small area situated between the I-55 Bridge and The Metal Museum. The park contains a few large shade trees and provides parking spaces that overlook the Mississippi River. The park may eventually connect to Martyr Park and become part of the Memphis Riverwalk system. Because of high noise from the interstate, the park appears to be underutilized.

Chickasaw Heritage Park Previously known as Desoto Park or Desoto Mounds was established around 1911 and is on the National Register owing to its archaeological significance as a Chickasaw-Mississippian culture heritage (900 to 1800 CE) area. During the Civil War, the mounds in the park were emptied of artifacts and used to store munitions. This park is adjacent to two vacant parcels that are use for park and open-space purposes but have residential zoning.

The National Ornamental Metal Museum is located west of Metal Museum Drive along the banks of the Mississippi River, outside of the proposed ROW and the study corridor. The National Ornamental Metal Museum, the first of its kind in the country, showcases the artistry of metalworkers from around the world. It is the only museum in the United States devoted exclusively to the exhibition and preservation of fine metalwork. Located in a historic hospital overlooking the Mississippi River, the museum features a series of galleries on two floors.

T.O. Fuller State Park is located approximately four miles south of the proposed I-55 Interchange Improvement project area. It is a historically, ecologically, and culturally important area. It was built in 1937 by the Civilian Conservation Corps and consists of 1,138 acres of mostly bottomland forest and wetland. It is named for Dr. Thomas O. Fuller, an African-American activist and educator during the late 1800's and early 1900's. In 1942 the area opened as Shelby Bluffs State Park and was the first park created for African-Americans east of the Mississippi River. Prior to 1950, much of the bottomland along the Mississippi River looked like T.O. Fuller State Park. T.O. Fuller State Park is culturally important due to relics and mounds from the Chucalissa Indian tribe found within its boundaries.

3.3.1.2 Regional Development

Recent development trends in the larger area surrounding the study area include residential, retail/commercial/office, and industrial growth. Spill-over development from Downtown has directly affected areas to the south, especially in the South CBID, which has E.H. Crump Boulevard as its southernmost boundary making it immediately adjacent to the study area. The aged structures and old industrial and commercial properties in the South CBID have provided locations for new residential construction along the Mississippi River bluffs. These new residential uses include attached and detached single-family units, town homes, lofts, multiple-family apartments, and condominiums that have been constructed in renovated/rehabilitated buildings as well as on cleared or vacant land. In addition, retail/office/commercial uses are co-locating in this area, creating an exciting mixed use environment. Recent industrial development in the area south of E.H. Crump Boulevard largely includes light industrial and trucking/warehouse uses.

3.3.1.3 Land Use Controls

The City of Memphis has in place zoning and subdivision development ordinances that establish and exercise land use controls in and around the study area.

The area traversed by the proposed project includes two zoning districts: residential and highway commercial. Single-family uses are the primary permitted uses in the R-S6 District. The list of uses

permitted in the C-H District is long and varied but is primarily oriented to uses that are accessible to persons in vehicles.

3.3.1.4 Land Use Plans and Policies

Although land use in the study area is discussed in general terms in *Shelby County's Growth Plan* (adopted 1999, revised 2000), more detailed recommendations and guidelines for future land use are contained in two district plans formally adopted by the City: the *South Central Business Improvement District Comprehensive Plan* (November 2002) and the *South Memphis District Plan* (March 1999).

Ongoing and planned projects in the South CBID that lie immediately north of the project area include new and renovated mixed uses for properties in those sections of the Gateway Commercial District that are located on both sides of E.H. Crump Boulevard, from Kansas Street east to Latham Street. Those uses will include higher density residential, office, retail, commercial, and institutional. Immediately adjacent to and north of the Gateway Commercial uses are commercial and office uses in the South CBID, which will provide a campus-like environment adjacent to the CBD and to residential neighborhoods. Other planned projects include residential development in the Bluffview Residential District north of those commercial uses between Kansas Street and Texas Street. Uses in that District are focused on the retention and reuse of historic warehouse structures and the historic elements associated with them while encouraging new architecturally compatible new development with public infrastructure and amenities that will create an attractive and comfortable environment. Additional residential uses are proposed in the South Downtown Residential District south of E.H. Crump Boulevard from Third Street to South Danny Thomas Boulevard. That District is intended to permit the development of low to moderate income housing in pedestrian-friendly neighborhoods with some subordinate mixture of local commercial and retail activities. A new fire station planned for the Riverside Residential District on Channel 3 Drive will serve the needs of the South CBID, as well as those of the project area.

Land uses in the study area are determined by the *South Memphis District Plan*, which was adopted in 1999. The Plan shows that properties in the area south of E.H. Crump Boulevard and east of I-55 are zoned and recommended in the future for light or heavy industrial uses, which corresponds to their existing zoning and uses. That part of the study area south of E.H. Crump Boulevard and west of I-55 is zoned and recommended in the future for various mixed uses. Single-family residential use predominates and commercial/office, institutional, light and heavy industrial, high-density multi-family, and park-recreation are the other permitted uses, which corresponds to their existing zoning and uses.

3.3.2 Potential Land Use and Infrastructure Impacts of the No-Build Alternative

3.3.2.1 Direct Impacts and Infrastructure – No-Build Alternative)

Under the No-Build Alternative existing land uses within the proposed project area would most likely continue into the future without major changes. Some minor planned changes including mixed used developments north and northeast of the project area are anticipated. Highway maintenance activities would continue at current levels.

3.3.2.2 Indirect Impacts (Land Use and Infrastructure – No-Build Alternative)

Because no activities related to the proposed I-55 Interchange project would occur under the No-Build Alternative, there would be no indirect impacts to land use and infrastructure.

3.3.2.3 Cumulative Impacts (Land Use and Infrastructure – No-Build Alternative)

Land use and infrastructure under the No-Build Alternative would likely remain similar to current conditions. There would be new developments in the area, especially north and northeast of the project area, but no dramatic changes in land use would occur as those areas were previously

developed and used for industrial uses. There are no other proposed developments that would noticeably change land use within the project area.

3.3.3 Potential Land Use and Infrastructure Impacts of Alternative A

3.3.3.1 Direct Impacts (Land Use and Infrastructure –Alternative A)

Implementation of the proposed project will result in both adverse and beneficial impacts to existing and future land use within the project area. The primary direct adverse impact will be the conversion of currently developed residential and commercial areas to a highway and associated ROW. Approximately 25 parcels (improved and unimproved) will be directly impacted by ROW acquisition under Alternative A, with approximately 6 acres of new ROW required. Other direct adverse impacts include the displacement of eight residences and one business as a result of project implementation.

Beneficial long-term land use impacts are expected to occur as a result of project implementation. Improved accessibility under Alternative A will benefit the remaining businesses within the southwest quadrant of the project area, and those sites currently available for redevelopment, such as the former Ramada Inn site on Alston Avenue and the former U.S. Army Reserve Center. Highway improvements will update the transportation system to current standards.

3.3.3.2 Indirect Impacts and Infrastructure –Alternative A)

Relocation of the displaced residences may result in loss of existing open space as replacement homes may be constructed on existing vacant lands adjacent to French Fort and Chickasaw Heritage Park. This land is already zoned for residential land uses; therefore this would not result in major changes to anticipated land uses in the project area.

There is some potential that improvements to the existing I-55 Interchange would result in some secondary or induced growth in the general project vicinity, because traffic flow would be improved. However, due to existing zoning and limited amount of developable land in the immediate project vicinity, it is not likely that substantial development would result. Other development and revitalization projects anticipated to occur in the more general project vicinity, especially those areas north and northeast of the project, would likely occur whether or not the I-55 Interchange project is completed. Therefore, the impacts of those developments would not be considered indirect impacts of this project.

3.3.3.3 Cumulative Impacts (Land Use and Infrastructure –Alternative A)

Cumulative impacts associated with this project in combination with other past, present, and reasonably foreseeable future projects would include potential land use changes including increased industrial, commercial, and residential development, overall improvement of the transportation infrastructure resulting in improved traffic flow and freight movement through the region, and a general revitalization of the south and west Memphis areas. It is anticipated that most of the industrial land use increases would occur in areas south or southwest of the project area, such as in the President's Island vicinity. The improved transportation infrastructure, new industrial and commercial developments, and revitalization of former industrial areas may promote increased residential development in the surrounding areas, which would maintain and enhance residential land uses in Memphis and West Memphis just across the Mississippi River in Arkansas.

The combination of all past, present, and reasonably foreseeable future development projects may result in additional infrastructure projects needing to be implemented to continue to provide adequate facilities capable of supporting the growth. In general, most areas where new developments are expected to occur would be located in previously developed areas with much of the infrastructure, such as access roads, utilities, and other essential items already in place. Therefore, it is anticipated that only a small number of measurable infrastructure expansion or improvement projects would be needed in the reasonably foreseeable future in the project vicinity. Overall, the general land uses in

the project vicinity would not change substantially and would continue to be of mixed industrial, commercial, and residential land uses typical of an urban area such as Memphis. The I-55 Interchange project is not expected to contribute to any major land uses changes that would not have occurred if the I-55 improvements were not made. The project will help provide needed transportation support for those projects.

3.3.4 Potential Land Use and Infrastructure Impacts of Alternative B

3.3.4.1 Direct Impacts (Land Use and Infrastructure –Alternative B)

Direct impacts to land use and infrastructure associated with Alternative B would be essentially the same as those discussed under Alternative A.

3.3.4.2 Indirect Impacts (Land Use and Infrastructure –Alternative B)

Indirect impacts to land use and infrastructure associated with Alternative B would be essentially the same as those discussed under Alternative A.

3.3.4.3 Cumulative Impacts (Land Use and Infrastructure –Alternative B)

Cumulative impacts to land use and infrastructure associated with Alternative B would be essentially the same as those discussed under Alternative A.

3.3.5 Mitigation

Mitigation measures, as defined by the Council on Environmental Quality (40 CFR 1508.20), include avoiding impacts, minimizing impacts, rectifying impacts, reducing or eliminating the impact over time, and compensating for the impact. Shelby County has mechanisms in effect to minimize, mitigate, or avoid adverse impacts to land use that could potentially result from project implementation. Potential changes to land use that may result from indirect and cumulative impacts can be addressed through implementation and application of applicable Memphis and Shelby County growth policy plans, zoning and subdivision ordinances, design guidelines, and other special ordinances and/or policies.

All land acquisitions and relocation of displaced households, businesses, and any other affected parties would be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972 and the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646). For this project, it is anticipated that all of the displaced residents will be provided the option to relocate on existing vacant land located adjacent to the west of the French Fort neighborhood.

3.4 Farmland, Soils, and Physical Resources

3.4.1 Affected Environment

3.4.1.1 Farmland

The Farmland Protection Policy Act of 1981 (FPPA) seeks to "to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses, and to insure that Federal programs are administered in a manner that, to the extent practicable, will be compatible with State and local government, and private programs and policies to protect farmland." In accordance with the FPPA, a Farmland Conversion Impact Rating Form was submitted to the USDA, Natural Resources Conservation Service (NRCS) in January 2003. The NRCS response letter stated that because the area in question is already considered to be under urban and transportation land uses the area exempt from further Farmland Protection Policy Act consideration. Therefore, no prime farmland is considered to be present in the project area. The NRCS response letter is included in Appendix A.

3.4.1.2 Soils

Soils in the project area belong to the Memphis-Grenada-Loring association (USDA, 1970). They are nearly level to sloping, well drained and moderately well drained, silty soils located on broad uplands. They are characterized by broad, rolling, low-lying hills, the sides of which are dissected by numerous small drainageways. The tops of the hills are nearly level and fairly wide. The major soils of this association are suited to a wide variety of urban uses.

The soils in this association developed in silty deposits more than 20 feet thick. Memphis soils are on the broader ridge tops and the steeper hillsides. They are well drained and have a brown, silty surface layer and subsoil. Grenada soils are common on nearly level ridge tops and sloping hillsides. They have a surface layer of brown silt loam and a subsoil of yellowish-brown silt loam. A fragipan begins at a depth of 15 to 30 inches. Loring soils are on ridge tops and hillsides. They have a brown silty surface layer and a subsoil of dark-brown silt loam. A weak fragipan begins at a depth of about 28 inches.

The project area is located in a graded land, silty materials (Gr) soil unit according to the USGS soil survey. This land type consists of areas that have been graded in preparation for subdivisions and for commercial and industrial building. Depth of grading ranges from a few inches to five feet or more. The slope after grading is generally 1 to 5 percent. In most areas the original soil profiles have been disturbed to the extent where they are no longer identifiable. Soil material is brown, yellowish brown, and dark brown in color and silty in texture. The soils immediately surrounding the project area soil unit are part of the Memphis series.

3.4.1.3 Topography and Geology

Shelby County is located in the southwest corner of Tennessee and occupies 480,640 acres (751 square miles). The average altitude in Shelby County is 300 feet above sea level. Approximately 90 percent of the county lies on the West Tennessee Plain and is rolling to hilly with various dissecting drainages. The remaining 10 percent of the county is on the Mississippi River Alluvial Floodplain, half occurring on islands within the river. Wolf River, Loosahatchie River, and Nonconnah Creek are responsible for draining the majority of Shelby County’s water into the Mississippi River.

The West Tennessee Plain lies between the West Tennessee Uplands and the Mississippi River Alluvial Floodplain and covers 4,700 square miles. It slopes gently westward from an elevation of approximately 450 feet down to about 300 feet. The area is mostly gently rolling hills interrupted by small ridges and drainage divides. Some gullies have developed in local areas throughout the region and swampy conditions are very common around most of the larger drainage systems. Geologically

the area is composed of sand, gravel, silt, and clay of Tertiary and Quaternary age. A thin surficial deposit of loess (wind deposited silt) covers much of the area.

The Mississippi River Alluvial Valley is the westernmost province in Tennessee. It is an almost flat, narrow belt covering more than 900 square miles from the west edge of the West Tennessee Plain to the Mississippi River. The average altitude is less than 300 feet and much of the area is marshy land below the high water mark of the river. Mud, sand, gravel, and silt (loess) of Quaternary age are the geologic formations that comprise the area.

The project area is located at the western edge of the West Tennessee Plain. Near the project location, the West Tennessee Plain extends to the edge of the Mississippi River and terminates as a bluff line. The Mississippi River Alluvial Valley is non-existent on the Tennessee side of the river adjacent to the project area. The proposed project area is located well above the 100-year and 500-year floodplains. Because the area is above the floodplain, is adjacent to the Mississippi River, and contains soils and topography conducive to urbanization, the majority of the natural surface features and habitats have been altered or completely removed from within the project area over time.

3.4.2 Potential Farmland, Soils, and Physical Resources Impacts of the No-Build Alternative

3.4.2.1 Direct Impacts (Farmland, Soils, and Physical Resources –No-Build Alternative)

Under the No-Build Alternative no direct impacts to farmland, soils, or physical resources would be anticipated. No areas of prime and unique farmland would be directly impacted under the No-Build Alternative.

3.4.2.2 Indirect Impacts (Farmland, Soils, and Physical Resources –No-Build Alternative)

Under the No-Build Alternative no indirect impacts to farmland, soils, or physical resources would be anticipated. No areas of prime and unique farmland would be indirectly impacted under the No-Build Alternative.

3.4.2.3 Cumulative Impacts (Farmland, Soils, and Physical Resources –No-Build Alternative)

Under the No-Build Alternative no cumulative impacts to farmland, soils, or physical resources would be anticipated. No areas of prime and unique farmland would be cumulatively impacted under the No-Build Alternative.

3.4.3 Potential Farmland, Soils, and Physical Resources Impacts of Alternative A

3.4.3.1 Direct Impacts (Farmland, Soils, and Physical Resources –Alternative A)

The NRCS determined that the project area is urban and no areas of prime and unique farmland would be directly impacted by the proposed project, if Alternative A were implemented. Construction and earth moving activities would disturb soils within the project area resulting in minor, direct adverse impacts. The potential for soil erosion would increase during the construction phase. It is unlikely that any additional and substantial long-term adverse impacts to topography would occur in the immediate proximity of the interchange as result of Alternative A. This project involves improvements to an existing interchange so extensive earth-moving activities, such as cut-and-fill, would not be required. Minor impacts to topography would be from construction of retaining walls and from grading. No substantial impacts to geological resources are anticipated.

3.4.3.2 Indirect Impacts (Farmland, Soils, and Physical Resources –Alternative A)

No substantial indirect impacts to farmland, soils, or geology would occur if Alternative A is implemented. Many of the secondary developments that may be promoted by the transportation improvements provided by this project would likely occur in areas that have already been disturbed or graded in the past or in easily developable areas not requiring substantial grading or other impacts to

soils and geology. It is anticipated that most new development that is anticipated in the project vicinity would occur regardless of the I-55 Interchange improvements, therefore the impacts of those project would not be considered to be indirectly caused by this project.

3.4.3.3 Cumulative Impacts (Farmland, Soils, and Physical Resources –Alternative A)

Any impacts to farmland, soils, and geological features resulting from this project would be cumulative to similar impacts associated with other past, present, and reasonably foreseeable future projects. However, it is not anticipated that substantial new impacts would occur as both this project and many of the developments would occur in previously developed urban areas. Therefore, no substantial cumulative impacts to farmland, soils, or physical resources are anticipated.

3.4.4 Potential Farmland, Soils, and Physical Resources Impacts of Alternative B

3.4.4.1 Direct Impacts (Farmland, Soils, and Physical Resources –Alternative B)

Direct impacts to farmland, soils, and physical resources associated with Alternative B would be essentially the same as those discussed under Alternative A.

3.4.4.2 Indirect Impacts (Farmland, Soils, and Physical Resources –Alternative B)

Indirect impacts to farmland, soils, and physical resources associated with Alternative B would be essentially the same as those discussed under Alternative A.

3.4.4.3 Cumulative Impacts (Farmland, Soils, and Physical Resources –Alternative B)

Cumulative impacts to farmland, soils, and physical resources associated with Alternative B would be essentially the same as those discussed under Alternative A.

3.4.5 Mitigation

The NRCS determined that the project area is urban, and no areas of prime and unique farmland would be impacted by the proposed project, and therefore, no mitigation for farmland would be required under Alternatives A or B.

Although only short-term adverse impacts to soils are anticipated, all reasonable precautions will be taken to ensure that any potential adverse impacts to soils are minimized. Soil protection measures are described in the following documents:

1. *Tennessee Erosion and Sediment Control Handbook* (TDEC, 2001c).
2. *Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites* (Smoot, 1992).
3. *Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction* (TDOT, 2006).

Examples of mitigation measures include:

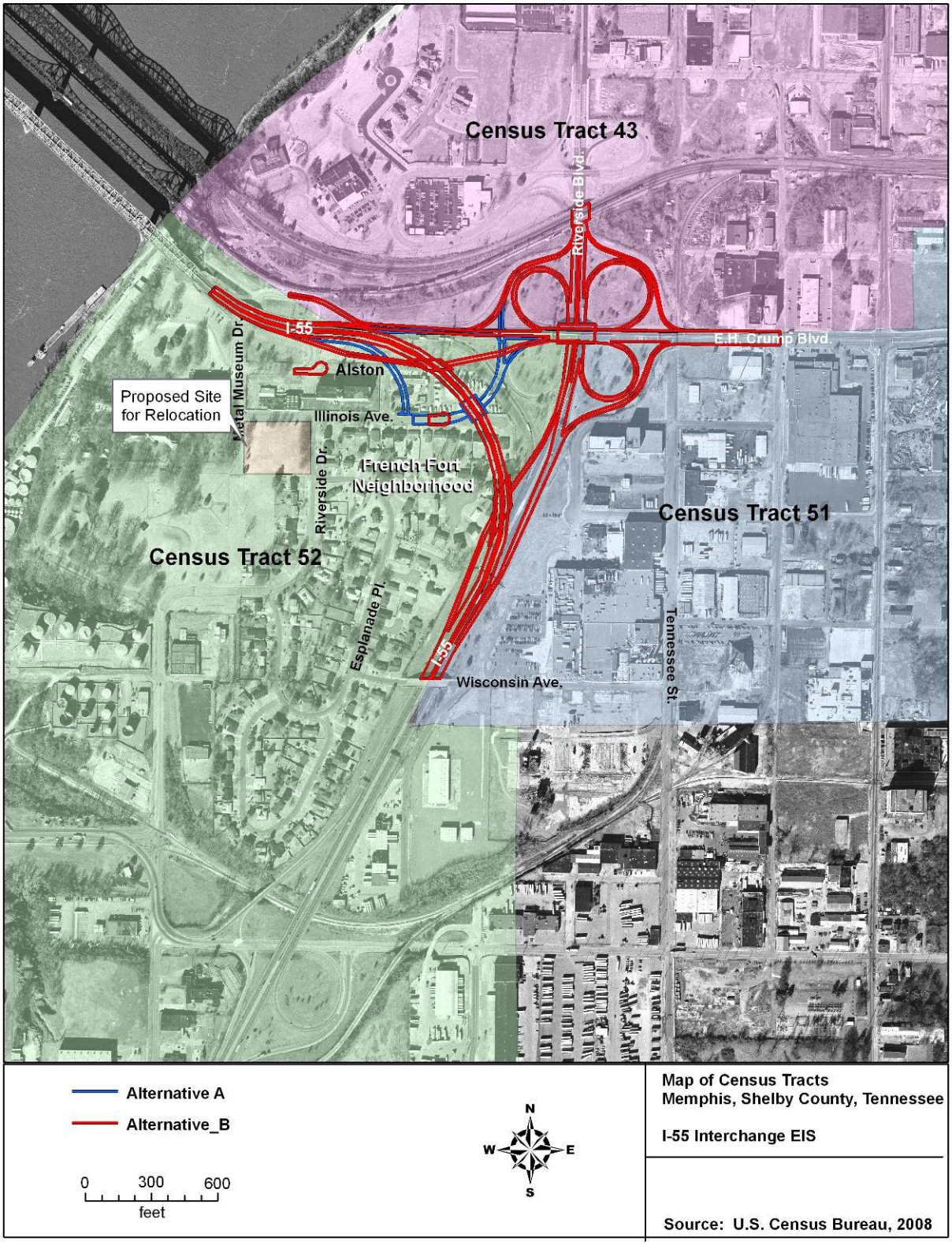
- The unnecessary removal of existing vegetation would be avoided. Canopy removal along all working or staging areas would be limited to the extent practicable.
- Where removal of vegetation is necessary, sediment control measures would be employed immediately at the start of construction.
- Areas disturbed during construction will be revegetated as soon as possible.
- Control structures would be inspected and properly maintained throughout the life of the project.

3.5 Social Environment

3.5.1 Affected Environment

Detailed population, housing, and household data were obtained from the 1990 and 2000 U.S. Census. The U.S. Census geographic areas in the project area include Shelby County, City of Memphis, Census tracts, Census block groups, and Census blocks. Each Census tract within the project area is comprised of only one block group and, thus, the data presented for the Census tract is identical to that available for the associated Census block group. A map of the Census Tracts is shown on Figure 3.2. However, each Census block group consists of various Census blocks. For example, Census tract 43 contains one Census block group and two Census blocks within the project area. Census tract 51 contains one Census block group and three Census blocks within the project area and Census tract 52 contains one Census block group and 13 Census blocks within the project area.

Figure 3.2. Map of Census Tracts for the I-55 Interchange Project in Memphis, Tennessee.



3.5.1.1 Population Trends

Population trends for the census geography areas are shown on Table 3.3. Although the population increased in Shelby County and the City of Memphis between 1990 and 2000, the population decreased in two of the three Census tracts within the project area. Census tract 52, which includes the southwest quadrant of the I-55 Interchange at E.H. Crump Boulevard, experienced an 11 percent decrease in population during this period, while Census Tract 51 had a 60 percent decrease. None of the population decrease in Census tract 52 occurred within the French Fort neighborhood directly impacted by the proposed project. However, the population of Census tract 43 increased by a substantial percentage (208%) between 1990 and 2000. Although no Census block data is available for 1990, it is assumed that this population increase did not occur within the project area as only two blocks within Census tract 43 are included in the project area.

Table 3.3 Population Trends, 1990-2000.

Geographic Area	2000 Population	Percent Population Change (1990-2000)
Shelby County, TN	897,472*	8.6
City of Memphis	650,100**	6.5
Census Tract 43	870	208
Block Group 1	870	208
Block 1031	3	NA
Block 1043	0	NA
Census Tract 51	159	-60
Block Group 1	159	-60
Block 1022	0	NA
Block 1067	0	NA
Block 1070	0	NA
Census Tract 52	461	-11
Block Group 1	461	-11
Block 1000	100	NA
Block 1001	0	NA
Block 1002	0	NA
Block 1003	0	NA
Block 1004	0	NA
Block 1005	24	NA
Block 1009	0	NA
Block 1010	105	NA
Block 1012	48	NA
Block 1013	77	NA
Block 1014	17	NA
Block 1015	33	NA

NA = data are not available.
* Shelby County population estimate in 2006 was 911,438
** Memphis Certified 2007 Population is 689,198

Source(s): U.S. Census Bureau, 1990 and 2000 Census and 2006 American Community Survey; Department of Economic and Community Development., 2007

3.5.1.2 Neighborhood and Community Cohesion

The French Fort residential neighborhood, located adjacent to the southwest quadrant of the existing interchange area, will be directly impacted by implementation of the proposed project. Although access will not be impacted and no division or splitting of this neighborhood will occur, implementation of Alternatives A or B would require the potential displacement and relocation of up to eight residences. In addition, up to two businesses would be potentially displaced and relocated under the Build Alternatives. All of these potential displacements would occur at the northeastern edge of the French Fort subdivision.

3.5.1.3 Environmental Justice

On February 11, 1994, President Clinton issued Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.* This EO was issued to provide that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations."

A Presidential memorandum that accompanied EO 12898 specified that Federal agencies "shall analyze the environmental effects, including human health, economic, and social effects, of Federal actions, including effects on minority communities and low-income communities when such analysis is required by the National Environmental Policy Act (NEPA) of 1969." The memorandum further stated that Federal agencies "shall provide opportunities for community input into the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities."

The initial step in this process is the identification of minority and low-income populations that might be affected by implementing the proposed action. FHWA Order 6640.23 defines minority as a person who is Black, Hispanic, Asian American, or American Indian/Alaskan Native and low-income means a household income at or below the U.S. Department of Health and Human Services Poverty Guidelines. For environmental justice considerations, these populations are defined as individuals or groups of individuals that are subject to an actual or potential health, economic, or environmental threat arising from existing or proposed Federal actions and policies.

Minority and low-income population data were collected for Shelby County, the City of Memphis, Census tracts, Census block groups, and Census blocks in the project area. Table 3.4 contains a summary of the minority and low-income population data. African American is the predominant minority population within Census tract 51 and 52 at 100% and 93% respectively. Census tract 43 was 21% African-American and 78% Caucasian. The weighted average poverty threshold for a family of four in 1999 in the United States was $17,029. The three Census tracts within the project area had a wide range of the population below the poverty level.

Table 3.4 Summary of Minority and Income Data for the I-55 Interchange Project Area.

Geographic Area	Percent Minority	Percent Below Poverty
Shelby County, TN	53%	16%
City of Memphis	66%	20%
Census Tract 43: Block Group 1	21%	13%
Census Tract 51: Block Group 1	100%	67%
Census Tract 52: Block Group 1	93%	6%
Source(s): U.S. Census Bureau, American Fact Finder 2000		

Because the area most impacted includes primarily minority populations, TDOT and FHWA have provided several opportunities for community input into the NEPA process, including identifying potential effects and mitigation measures in consultation with affected communities, or in this case the French Fort Neighborhood. As mentioned previously, the French Fort neighborhood is a middle-class neighborhood consisting of approximately 150 single-family residential houses on modest lots and was developed as part of an urban renewal project in the 1960s. This was one of the first middle-class African-American neighborhoods in the city.

TDOT, City of Memphis officials, and members of the French Fort neighborhood, where the primary impacts of the project would occur, have worked to find ways to minimize and compensate for the unavoidable impacts to the community. TDOT, the City of Memphis, and representatives of the French Fort neighborhood have agreed upon an option that would provide the displaced residents from the French Fort neighborhood an option to purchase property, currently owned by the City of Memphis, on which they could build comparable replacement housing. Mitigation measures are defined in more detail in Section 3.5.5 below and again in the discussions related to residential displacements in Section 3.6.

3.5.2 Potential Social Environment Impacts of the No-Build Alternative

3.5.2.1 Direct Impacts (Social Environment –No-Build Alternative)

No direct impacts to the social environment would be anticipated under the No-Build Alternative as no substantial changes from the baseline conditions would occur. No relocations of homes or businesses would be required under the No-Build Alternative.

3.5.2.2 Indirect Impacts (Social Environment –No-Build Alternative)

No substantial indirect impacts to the social environment would be anticipated under the No-Build Alternative. However, some adverse impacts to the social environment would be anticipated due to continued decreases in the already poor LOS of the I-55 Interchange. Decreasing LOS would have potential secondary impacts on other local roadways as drivers attempt to find alternative routes to avoid the highly congested I-55 Interchange. This would ultimately decrease LOS in other areas that would otherwise function better. Decreasing LOS in other areas would result in further potential adverse impacts to the local neighborhoods and communities. Increasing traffic in areas that would otherwise be utilized primarily by local traffic would result in potential increases in local congestion, commuting times, noise, and other adverse social impacts. Many of the local streets were not designed to handle large volumes of through traffic, especially large trucks. The integrity of the local roadways could be compromised, if they were used as long-term bypasses of the congested I-55 Interchange. Also, the safety of residents living along such bypass routes would decrease.

3.5.2.3 Cumulative Impacts (Social Environment –No-Build Alternative)

Some adverse cumulative impacts to the social environment would be expected due to increased industrial, residential, and commercial developments expected to occur in the general project vicinity regardless of whether the I-55 Interchange improvements are made. With no major improvement to the interchange, it would be expected that the additional traffic generated by other non-related projects would result in further decreases in LOS on local roadways. This would result in adverse impacts to the social environment due to increases in traffic congestion and noise and decreases in air quality and safety in and around the local neighborhoods. It is likely that more traffic may attempt to use the local neighborhood roadways to avoid traffic jams on I-55.

3.5.3 Potential Social Environment Impacts of Alternative A

3.5.3.1 Direct Impacts (Social Environment –Alternative A)

Alternative A would require the potential displacement and relocation of eight residences. In addition, two businesses would be potentially displaced and relocated under Alternative A. The

proposed realignment will have adverse impacts on minority populations. The Census data for the project area shows that the areas where reasonable alternatives could be identified for the project are also primarily populated by minorities. No reasonable alternatives could be identified that would meet the project purpose and need while eliminating impacts to minority populations. The impacts would not be considered disproportionate to minority population because there is no substantial human or environmental health impact anticipated that would differ from baseline conditions. The minority population in the project area would not suffer a greater impact than non-minority populations from the realignment.

There would be some beneficial impacts to the minority populations in the vicinity from improved traffic flow in the project vicinity. This would result in less traffic congestion, improved safety, and minor improvement to noise and air quality. Some loss of open space would occur due to development of the new interchange and on the vacant land where displaced residents are anticipated to relocate.

There are no anticipated disproportionate impacts to low-income populations in the project area since the population of census tract most impacted by the proposed realignment has only 6% below the poverty level. The surrounding census tracts households below the poverty level are 13% and 67%. Low-income populations would not suffer a greater magnitude of impacts than those above poverty levels.

3.5.3.2 Indirect Impacts (Social Environment –Alternative A)

The improved traffic circulation and enhanced accessibility will indirectly benefit the project area by enhancing community cohesion and providing connections between adjacent areas. In addition, relieving some of the congestion and improving access in the area would also improve response times for emergency vehicles attempting to reach the project vicinity.

3.5.3.3 Cumulative Impacts (Social Environment –Alternative A)

Opportunities for potential social and economic growth of the region would be improved as the infrastructure is modernized, which would facilitate connections between adjacent areas. The I-55 Interchange improvements would combine with all other transportation improvements in and around the City of Memphis to help relieve some of the existing traffic issues making commuting times and interconnectivity of the entire area better.

The I-55 Interchange project would combine with other new developments in the project vicinity, especially the mixed use developments anticipated for areas to the north and east of the project area. All of these projects would combine to help revitalize several former industrial areas that have become rundown over the years and provide potential increases in quality of life and new opportunities for some of the residents within and adjacent to those areas, especially for some of the census tracts that exhibit high rates of poverty.

3.5.4 Potential Social Environment Impacts of Alternative B

3.5.4.1 Direct Impacts (Social Environment –Alternative B)

Impacts associated with Alternative B would be similar to those discussed under Alternative A, except there is a possibility that only one business would be impacted by Alternative B versus the two impacted under Alternative A. If the second business, the Southern Cotton Ginners Association, is able to remain in place and function at its current capacity, then the social impacts of Alternative B would be slightly reduced compared to Alternative A. Alternative B would also eliminate the current direct access to Metal Museum Drive, which would eliminate some current through traffic in the local neighborhood, but would also adversely affect the commuting options of the local residents and may adversely affect access by emergency vehicles, such as fire and ambulance service. These impacts would be considered long term but minor.

3.5.4.2 Indirect Impacts (Social Environment –Alternative B)

Indirect impacts associated with Alternative B would be essentially the same as those discussed under Alternative A. However, if the second business is not displaced then the potential social impacts would be slightly reduced. Alternative B would also eliminate the current direct access to Metal Museum Drive, which would eliminate some current through traffic in the local neighborhood, but would also adversely affect the commuting options of the local residents.

3.5.4.3 Cumulative Impacts (Social Environment –Alternative B)

Cumulative impacts associated with Alternative B would be essentially the same as those discussed under Alternative A.

3.5.5 Mitigation

To make sure that the proposed project is conducted in accordance with Executive Order 12898 "Environmental Justice", issued on February 11, 1994, this action has been sent to TDOT Civil Rights Staff for review. TDOT Civil Rights Staff will review the project to ensure that there are not disproportionately high and adverse health or environmental effects on minority and low-income populations. Upon their review and if modifications are needed, every attempt to comply with EO 12898 will be made.

Because no other alternatives were identified that would allow the I-55 Interchange improvements to occur without impacting at least some of the homes in the French Fort neighborhood, TDOT, City of Memphis officials, and members of the French Fort neighborhood, where the primary impacts of the project would occur, have worked to find ways to minimize and compensate for the unavoidable impacts to the community. TDOT, the City of Memphis, and representatives of the French Fort neighborhood have agreed upon an option that would provide the displaced residents from the French Fort neighborhood an option to purchase property, currently owned by the City of Memphis, on which they could build comparable replacement housing. The property consists of vacant land located adjacent to the west side of the existing French Fort neighborhood. This land would allow those displaced residents who wish to remain part of the French Fort neighborhood and local community enough space to relocate in the area and would therefore help to maintain neighborhood cohesion.

3.6 Relocation

3.6.1 Affected Environment

A total of ten potential displacements, consisting of eight single-family residences and two businesses, would occur as a result of implementation of Alternative A. The same potential residential displacements would occur under Alternative B, but with only one potential business displacement.

3.6.1.1 Residential Displacements

The potentially displaced single-family residences are located in the Southwest Quadrant of the existing I-55 and E.H. Crump Boulevard interchange. These households consist of eight single family residences within the French Fort Neighborhood. Four of these residences are on Illinois Avenue and four are located on Napoleon Place. A visual field survey indicated that all of the potentially displaced residences are in standard or sound condition. Based upon Shelby County Assessor of Property records, seven of the eight potentially displaced residences are owner-occupied. All of the potentially displaced residences are three-bedroom ranch style homes of frame and brick veneer construction built during the period from 1969 – 1975. The typical lot size ranges from 0.25 acres to 0.33 acres. Real property appraisals, including both improvements and land, range from $61,900 to $108,500 for the potentially displaced residences based upon the 2007 records of the Shelby County Assessor of Property. According to the 2000 U.S. Census, the median value of

owner-occupied housing was $72,800 in Census Tract 52, block group 1, compared to $92,200 for Shelby County and $72,800 for the City of Memphis.

The 1999 median household income for Census Tract (CT) 52, block group 1 was $40,583. All of the potential residential displacements would occur in this block group. In 1999 the median household income was $30,593 for Shelby County. It is estimated that none of the potential displacees would consist of a low-income household (below poverty level) based upon 1999 U.S. Census data on persons below poverty level for Census Tract 52.

The 2000 U.S. Census data for Census tract 52, block group 1, blocks 1000 through 1005 and 1014 were analyzed in order to determine general characteristics of the households to be displaced and relocated. The potential displacees are assumed to be representative of a cross-section of households within the census tract and include primarily families and elderly households. Since the majority of the residential properties are family households, there would be minimal displacement of elderly households and handicapped individuals. All of the potential residential displacees are African American. The typical household ranges in size from two to four persons, with the median age of the persons in block group 1 being 47.4 years.

3.6.1.2 Business Displacements

Minimal potential business displacement will occur with implementation of Alternatives A or B as two businesses will be displaced under Alternative A, and one business will be displaced under Alternative B. Both of these businesses, which are located in the southwest quadrant of the project area, represent small businesses with less than 25 employees. These businesses include the Southern Cotton Ginners Association at 874 Cotton Gin Place and the Mississippi River RV Park at 870 Cotton Gin Place. The first business represents an office and supply storage area for the Southern Cotton Ginners Association, while the second business involves the storage of RV campers and overnight RV camping.

3.6.1.3 Non-Profit Organization Displacements

There will be no displacement of non-profit organizations or agencies within the project area.

3.6.2 Available Replacement Housing in the City of Memphis

A review of residential properties listed for sale in the Memphis Area Multiple Listing Service (MLS) revealed an adequate supply of comparable replacement dwellings within the area. Considering the appraised valuations of the potentially displaced housing, the general price range for comparable housing is considered to be within the $60,000- $125,000 price range. As indicated in Table 3.5, there were a total of 486 one-story, single-family homes listed for sale in the $60,000 - $125,000 price range in the general project vicinity in November 2007 (search area included the 38106 zip code and the zip codes that share a border with the 38106 zip code). Approximately 75 percent of these listed homes are in the $75,000 - $125,000 price range. Similar to the potentially displaced residences, all of these listed properties have three bedrooms.

Table 3.5. Single-Family Homes for Sale by Price Range in the City of Memphis.

Price Range	Single-Family (3BR/2BA)	Single-Family (3BR/1.5 BA)	Total
$60,000 - $ 74,999	49	73	122
$75,000 - $125,000	156	208	364
TOTAL	**205**	**281**	**486**

Source: Memphis Area Association of Realtors, Multiple Listing Service, November 2007.
The search area included the Memphis 38106 zip code and the Memphis zip codes that share a border with the 38106 zip code.

According to local real estate brokers, there is a sufficient supply of single-family residences and apartments for rent in the City of Memphis. Monthly rental rates for 2-bedroom apartments/single-family homes generally range from $550-$800, and 3-bedroom apartments/single-family homes range from $600-$950 in Memphis and the immediate area. Monthly rental rates vary depending upon location of the property, age of dwelling unit, associated dwelling amenities, length of lease period, and other factors.

3.6.2.1 Other Relocation Options Identified for Displaced Residents

The City of Memphis, TDOT, and the members of the French Fort Neighborhood have been in coordination throughout the early planning stages of this project to discuss potential options for minimizing the impact to the French Fort Neighborhood. One option that has received support from the affected parties is that the displaced residents would have the option to purchase available vacant land located immediately adjacent to the existing French Fort neighborhood near Chickasaw Heritage Park that is currently owned by the City of Memphis. There is enough space available to provide enough lots for all of the displaced residents to relocate to this land. This would allow the displaced residents an option to construct new homes on the property and remain part of the French Fort Neighborhood while still allowing the I-55 Interchange improvements to occur. There may also be other developable land and/or abandoned properties located near the project area that could potentially be used to provide space to help relocate the displaced businesses within the general vicinity of the project area. TDOT will continue to follow the Uniform Relocation Assistance and Real Property Acquisition Act guidelines to ensure that all displacees are adequately relocated and/or compensated.

3.6.3 Potential Relocation Impacts of the No-Build Alternative

3.6.3.1 Direct Impacts (Relocation –No-Build Alternative)

Because no activities related to the proposed I-55 Interchange would occur under the No-Build Alternative, there would be no direct relocation impacts.

3.6.3.2 Indirect Impacts (Relocation –No-Build Alternative)

Because no activities related to the proposed I-55 Interchange would occur under the No-Build Alternative, there would be no indirect relocation impacts.

3.6.3.3 Cumulative Impacts (Relocation –No-Build Alternative)

Because no activities related to the proposed I-55 Interchange Project would occur under the No-Build Alternative, there would be no cumulative relocation impacts.

3.6.4 Potential Relocation Impacts of Alternative A

3.6.4.1 Direct Impacts (Relocation –Alternative A)

A total of ten potential displacements, consisting of eight single-family residences and two businesses, would occur as a result of implementation of Alternative A. A review of current residential properties listed for sale in the Memphis Area MLS revealed an adequate supply of comparable replacement dwellings within the general project area. However, because of the direct impacts this project would have on minority populations and because the impacted neighborhood is highly cohesive, additional efforts have been made for this project to ensure that the cohesiveness of this neighborhood is maintained to the extent possible. Those efforts have been successful in identifying vacant land, currently owned by the City of Memphis, which will be made available for purchase by the displaced residents. This land would provide those residents space to construct new homes that could still be considered part of the French Fort neighborhood. The vacant land is located almost directly west of the displaced residents existing homes on the west side of the existing neighborhood. The two displaced businesses relocations would be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972 and the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646).

3.6.4.2 Indirect Impacts (Relocation –Alternative A)

Although it is likely that the majority of displaced residents would be relocated on the vacant land adjacent to the existing French Fort Neighborhood, at least some housing resources within the City of Memphis or the region may be necessary for relocation of some of the displaced households. If needed, current vacant housing in the area would be utilized for this purpose. Due to the relatively small number of houses that would be needed, it is not expected that this project would have noticeable impacts in terms of affects on the housing market. It is possible that some of the displaced households may be relocated in housing of higher quality and value than their existing residence under the policies and guidelines of the Uniform Relocation Assistance and Real Property Acquisition Act.

3.6.4.3 Cumulative Impacts (Relocation –Alternative A)

No cumulative impacts in terms of relocation are anticipated under Alternative A. Even when combined with potential relocations of other past, present, and reasonably foreseeable projects in the region, it is not anticipated that any impacts to the local or regional housing market would occur. There are currently no shortages in available homes in the region, and it is anticipated that additional residential developments would occur in the general project vicinity in the foreseeable future.

3.6.5 Potential Relocation Impacts of Alternative B

3.6.5.1 Direct Impacts (Relocation –Alternative B)

Direct impacts associated with Alternative B would be the same as those discussed for Alternative A. However, it is possible that there would be one less business displacement under Alternative B. If it is determined that the second business, the Southern Cotton Ginners Association, can remain at their present facility, there would be a total of nine potential displacements, consisting of eight single-family residences and one business.

3.6.5.2 Indirect Impacts (Relocation –Alternative B)

Indirect impacts associated with Alternative B would be the same as those described for Alternative A.

3.6.5.3 Cumulative Impacts (Relocation –Alternative B)

No cumulative impacts in terms of relocation are anticipated under Alternative B.

3.6.6 Mitigation

The State's Relocation Assistance Program will be utilized to ensure to the maximum extent possible the prompt and equitable relocation and reestablishment of persons and businesses displaced as a result of this project. The Relocation Assistance Program helps to ensure that displaced parties do not suffer disproportionate harm as a result of programs designed to benefit the public as a whole.

The relocation of displaced households, businesses, and any other affected party will be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972, and the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646). Comparable replacement housing will be provided to all residential relocatees under the provisions of the above laws. Comparable replacement housing is defined as follows: a decent, safe, and sanitary dwelling; functionally equivalent to the existing displaced dwelling; in a location not less desirable than the existing displaced dwelling; on a site that is typical in size for residential development; currently available on the private market; and within the financial means of the displaced person. It is anticipated that all displaces will be relocated successfully. However, if any situation should exist where comparable decent, safe, and sanitary housing within the financial means of the displaced person is not available; such housing will be made available under the replacement housing of "last resort" provisions of the above laws. Relocation services will be provided without regard to race, color, religion, or national origin. Relocation payments and financial assistance will be in accordance with the above laws.

It is anticipated that at least some of the displaced residents would choose to construct new homes on the vacant land adjacent to the French Fort Neighborhood that will be made available by the City of Memphis for private purchase for residential development. This would allow those residents, who choose the option, to remain part of the neighborhood and help maintain the cohesiveness of the area. The City of Memphis, TDOT, and the residents will continue to coordinate the details of the potential relocation to the vacant property. Other displaced residents may choose to relocate to other portions of Memphis, or elsewhere.

3.7 Economics

3.7.1 Affected Environment

There are various key indicators of economic conditions and growth within an area, including changes in labor force, employment, capital investment, retail sales, and property values. These economic variables are discussed in the context of Shelby County.

3.7.1.1 Major Industries and Commercial Activity

At the center of a major distribution network, Memphis works from a broad economic base as it continues to diversify its employment opportunities. Historically, a trading center for cotton and hardwood, Memphis is the headquarters for major manufacturing, services, and other business concerns. Items and goods produced in the Memphis area include chemicals, machinery, clothing, foodstuffs, electronic equipment, pharmaceuticals, cosmetics, ceiling fans, smokeless tobacco, gift wrap, and bubble gum.

The city is home to three Fortune 500 company headquarters: FedEx, AutoZone, and International Paper. FedEx began its operations in 1973, with 14 small aircraft delivering packages from Memphis International Airport. Today, FedEx averages more than 6 million shipments per day, and serves more than 220 countries and territories. AutoZone opened its first Auto Shack in Forrest City, Arkansas in 1979; the company is now a leading auto parts retailer, with more than 3,400 stores nationwide. International Paper, organized in 1878, is the largest paper and forest products company in the world, with operations in more than 40 countries.

Memphis's economy is diverse. Services centered in Memphis include banking and finance (First Tennessee, National Commerce Bancorp, and Union Planters); real estate (Belz Enterprises, Boyle Investment Co., and Weston Co.); nonprofits including the world's largest waterfowl and wetlands conservation organization (Ducks Unlimited); and a restaurant chain (Backyard Burgers). Science and technology business is very well represented in Memphis; Brother Industries USA, Buckman Laboratories, Medtronic Sofamor Danek, Morgan-Keegan, Sharp Manufacturing of America, Smith & Nephew, and Wright Medical Technologies all have headquarters in Memphis.

Memphis is considered a mid-South retail center and an attractive tourist destination. Its early and continued role as a major cotton market makes agribusiness an economic mainstay in Memphis. Forty percent of the nation's cotton crop is traded in Memphis, home of three of the world's largest cotton dealers: Dunavant Enterprises; Hohenburg Brothers (now Cargill Cotton); and the Allenberg Company. Memphis is important in other areas of agribusiness. The city has long been established as a prime marketing center for hardwood, as well as wood and paper products. Memphis businesses are also major processors of soybeans, meats, and other foods. Enhancing Memphis's position at the center of agribusiness is Agricenter International, an $8 million, 140,000 square foot exhibition center for agricultural exhibitions, experimentation, and information exchange. It brings together the most technologically advanced methods of farming and farm equipment available in one location.

Commercial Shipping

Memphis' Uniport combines a Foreign Trade Zone with river, air, rail, and road facilities to make Memphis one of the nation's most important distribution centers. The Memphis River Port, which connects the City to 25,000 miles of interconnected inland waterways, is the second largest inland port on the Mississippi River, and the fourth largest port in the nation. There are three still-water harbors, which include public terminals, loading facilities, grain elevators, and intermodal connections.

Memphis International Airport is less than 15 minutes from most business centers in the area and serves major airlines and commuter lines. One of the nation's fastest-growing airports, it is often the site of expansion projects, including improvements to cargo facilities. It is the world's busiest cargo airport because of FedEx, UPS, and other air freight companies that move approximately 2.4 million tons of cargo annually.

Transport Topics, a national newspaper for the trucking industry, has called Memphis "an intermodal transportation hub like no other." The area is served by over 300 common carriers, including all major truck lines. Over 100 terminals offer direct services to all 48 contiguous states, as well as to Canada and Mexico. The presence of five Class I rail systems makes Memphis a center for world distribution in the new economy. Memphis is one of only three U.S. cities served by five or more such systems. Eight federal highways, three interstate highways, and seven state highways connect the Memphis trucking industry with the nation and with other vital forms of transportation.

Retail

Retail sales trends for Shelby County for the 1996 to 2001 time period are shown in Table 3.6. The majority of Shelby County’s retail sales occur in Memphis. Shelby County experienced an approximate six percent increase in retail sales between 1999 and 2001. Retail sales trends for the post-1998 period cannot be accurately compared to the pre-1998 period because of changes in retail classification in 1998.

Table 3.6. Retail Sales Trends, 1996-2001 ($billion).

Region	2001	2000	1999[1]	1998	1997	1996
Shelby County	$12,024	$10,649	$11,291	$10,600	$9,107	$8,790

[1] Due to changes in retail classification in 1998, sales are not comparable to prior years.

Source: Tennessee Department of Economic and Community Development, 2003.

3.7.1.2 Employment

In 2007, Shelby County's annual civilian labor force and total employment approximated 451,670 and 429,950 respectively based on data from the Tennessee Department of Labor and Workforce Development. The annual average unadjusted unemployment rate in 2007 in Shelby County was 4.8 percent, with the statewide average being 4.4 percent.

Total non-farm employment within Shelby County increased by approximately 19 percent between 1990 and 2000, less than the statewide increase of 26 percent during this same period. Employment by the major industry sectors in 2006, including the government sector, is shown on Table 3.7. The services and retail trade sectors account for almost one-half of the employment in Shelby County, with government and transportation/public utility being other major employment sectors. Overall, Shelby County has a balanced and diversified employment base. The major employers in Shelby County, which are listed in Table 3.8, reflect the predominance of service sector employment.

Table 3.7. Non-Farm Full and Part-Time Employment by Major Industry Sector, Shelby County, Tennessee (by place of Work), 2006.

Industry Sector	Shelby County	
	Employment	Percent of Total
Total Non-Farm Employment	410,560	-
	Sector Employment	
Ag. Services, Forestry, Fishing, Hunting, and Mining	445	<1
Construction	25,209	6
Manufacturing	40,096	10
Wholesale Trade	20,357	5
Retail Trade	49,851	12
Transportation and warehousing, and utilities	49,171	12
Information	7,088	2
Finance and insurance, and real estate and rental and leasing	27,047	7
Professional, scientific, management, administrative and waste management services	39,377	10
Educational services, health care, and social assistance	80,233	20
Arts, entertainment, and recreation, and accommodation, and food services	31,641	8
Other services, except public administration	22,866	6
Public administration	17,179	4

Source: U.S. Census Bureau, 2006.

Table 3.8. Major Employers in Memphis, Shelby County, Tennessee in 2007.

Employer*	Number Employees
Federal Express (FedEx)	30,000
Memphis City Schools	16,000
United States Government	14,800
Methodist Healthcare	10,000
Baptist Memorial Health Care Corp.	8,000
Shelby County Government	7,183
Memphis City Government	6,680
Wal-Mart Stores, Inc.	6,500
Naval Support Activity Mid-South	6,500
Tennessee State Government	5,247
Shelby County Schools	5,014
Methodist Health Care	4,335
University of Tennessee, Memphis	4,000
** Several other major employers not listed in this table employ over 1,000 employees in the Memphis Area. Source: Memphis Regional Chamber of Commerce, 2007*	

3.7.1.3 Economic Growth and Incentive Programs

Table 3.9 portrays the trends in industrial growth investment (i.e., manufacturing, distribution, headquarters, selected service projects, etc.) during the 1992 to 2000 time period. During this nine-year period, approximately $8,859 million was invested in new industries and expansion of existing industries in Shelby County. The majority of this growth and investment has occurred since 1997.

Table 3.9. Announced Industrial Growth/Capital Investment, 1992-2001($million).

Region	2000	1999	1998	1997	1996	1995	1994	1993	1992	Total 1992-2000
Shelby County	$1,345	$1,945	$1,137	$1,612	$871	$793	$503	$396	$256	$8,859
[1] Includes new industry and expansion of existing industries. Numbers rounded to the nearest million. *Source: Tennessee Department of Economic and Community Development, 2003.*										

Incentive Programs - New & Existing Industries

Local programs

Think Memphis: Partnership for Prosperity is a public-private initiative whose goal is to make Memphis and Shelby County more globally competitive and attractive to businesses looking to relocate and expand. The program is in part a continuation of Memphis 2005, an economic development program begun in 1996 that aimed to diversify the economy, raise the per capita income, generate 12,000 net new jobs annually, increase minority and woman-owned business development, and lower the crime rate. Memphis 2005 has been credited with Memphis' average nonresidential capital investment of more than $1 billion a year, 10,000 net new jobs annually, and increased per capita income above the national average. *Think Memphis* also aims to enhance the economic vitality of the Memphis area through collaboration with its chambers of commerce, local and state

governments, and other organizations. The initiative, a ten-year multi-million dollar marketing effort, aims to attract 10,000 newcomers to the region, and encourage Memphis residents to remain.

State programs

Tennessee is a right-to-work state, and its overall state and local tax burden is among the lowest of all 50 states. Tennessee has no personal income tax on wages or salaries. Finished goods inventories are exempt from personal property tax, and industrial machinery is totally exempt from state and local sales taxes. Manufacturers receive other tax exemptions under specified circumstances and reduced property assessments. State-administered financial programs for businesses include: the Small and Minority-Owned Business Assistance Program, currently being developed by the state Treasury Department and expected to provide assistance to small and minority-owned businesses through loans, technical assistance, and program services; the Small Business Energy Loan Program, which helps qualified Tennessee-based businesses upgrade their level of energy efficiency in their buildings and manufacturing processes; the FastTrack Infrastructure Program, which assists in the funding of infrastructure improvements for businesses locating or expanding in Tennessee; and the FastTrack Training Services Program, which helps companies provide training for their staff.

The State of Tennessee provides funds for eligible projects that can offset costs that are incurred during the training process. Each project is considered separately based on its economic impact to the state. This program does not include wage payments to persons involved in the training program. Vocational training in Memphis is available through the Tennessee Technology Center, State Technical Institute of Memphis, Mid-South Quality Productivity Center, Southeast College of Technology, and through the public schools.

Development Projects

In January of 2003, Cannon Center, a world-class performing arts center at the north end of Main Street, opened its doors. On the south end, Peabody Place Entertainment and Retail Center, a multifaceted entertainment center, opened in fall of 2001. This city within a city attracts more than 8 million visitors annually; it encompasses three blocks of Beale Street, and includes the Peabody Hotel, the Orpheum Center, FedEx Forum (home of the NBA Memphis Grizzlies) and AutoZone Park (home of the AAA Memphis Redbirds), plus 80 restaurants. A $30 million Westin Hotel is being built next to the FedEx Forum, replacing a parking lot. AutoZone Park is a world-class baseball stadium that has been credited with stimulating nearby developments ranging from restaurants, night clubs, retail developments, and commercial and residential projects. The major one is Echelon at the Ballpark, a residential/business facility whose amenities include nine-foot ceilings, pass-through fireplaces, balconies with a ballpark view, a fitness center, and business facilities. Other recent projects include the renovation of the Kress Building (listed in the National Historic Register) into an annex of the adjacent Marriot Hotel, and renovation of the Lawrence Building into a luxury condominium with unique "live/work" areas on the first floor for professionals who work at home.

3.7.1.4 Property Values

Property value trends for the 2000 to 2006 time period are shown in Table 3.10. Shelby County had a 28 percent increase in total property value during this six-year period. The City of Memphis accounts for approximately 61 percent of Shelby County's total property value. Property value increases reflect primarily real property and improvements through new construction of buildings and facilities that are added to the tax rolls. However, some of the increases in property valuations during this time period were due to reassessments. Nonetheless, property valuation trends are a good indicator of economic growth and construction activity within a region or political jurisdiction.

Table 3.10. Estimated Property Values[1], 2000-2006 ($billion).

Region	2006	2000	Percent Change, 2000-2006
Shelby County	$59,086	$46,097	28

[1] Appraised values. Includes real, personal, and public utility property.
Source: Tennessee Comptroller of the Treasury, Division of Property Assessments, Tax Aggregate Report, 2006 and 2000.

Real property appraisals for residences that would be impacted by the I-55 Interchange improvements, including both improvements and land, range from $61,900 to $108,500 for the potentially displaced residences based upon the 2007 records of the Shelby County Assessor of Property. According to the 2000 U.S. Census, the median value of owner-occupied housing was $72,800 in Census Tract 52, block group 1, compared to $92,200 for Shelby County and $72,800 for the City of Memphis.

3.7.2 Potential Economic Impacts of the No-Build Alternative

3.7.2.1 Direct Impacts (Economic –No-Build Alternative)

Most of the existing economic conditions and trends would likely continue into the foreseeable future under the No-Build Alternative. However, not improving the existing I-55 Interchange at E.H. Crump Boulevard and South Riverside Boulevard would likely slow economic growth and development in the portions of Memphis that rely on I-55, E.H. Crump Boulevard, and/or South Riverside Boulevard as primary access routes to or from the region. As traffic volumes continue to increase in the Memphis area, the already poor LOS at the I-55 Interchange will continue to decline, if no major changes are made. This would make the areas that rely on these roadways much less attractive. Because I-55 is a primary truck route, many industries rely heavily on it for transporting goods to and from their facilities. If traffic issues continue to deteriorate due to the existing interchange design, existing industries and potential new industries may not choose to continue utilizing the area. This would be detrimental to the local and regional economies. Although truck access in other portions of Memphis may be suited to continued industrial and economic growth, the southwest portion of Memphis would be adversely impacted. These adverse impacts to the economy would primarily affect the important intermodal transportation facilities available along the Mississippi River in the southwest Memphis area. This portion of the City is important to the overall economy, both locally, regionally, and for the State of Tennessee.

3.7.2.2 Indirect Impacts (Economic –No-Build Alternative)

Not improving the existing I-55 Interchange would result in potential adverse economic impacts that could continue well into the future. Not only would declining LOS have immediate impacts to the local and regional economies, but the effects would become worse with time. Decreased transportation capabilities would ultimately influence choices made by commercial and industrial leaders whether to locate or expand facilities in the Memphis area, versus moving to other cities that may be able to provide better transportation service. Any loss of prospective industrial development in the area due to the declining traffic conditions from not improving the I-55 Interchange would be detrimental to continued economic growth and prosperity. The impacts would ultimately result in fewer new job openings in the region and ultimately adversely impact unemployment rates, income, and other economic factors. It is not possible to quantify or determine exactly what those impacts would be at this time, but some adverse impacts would be anticipated.

Continued decreases in the already poor LOS of the I-55 Interchange would have potential secondary impacts on other local roadways as drivers attempt to find alternative routes to avoid the highly congested I-55 Interchange. This would ultimately decrease LOS in other areas that would otherwise

function at better LOS. Decreasing LOS in other areas would result in further potential adverse impacts to the local and regional economies.

3.7.2.3 Cumulative Impacts (Economic –No-Build Alternative)

Manufacturers, business vendors, and suppliers dependent upon product transport would not have optimum transportation infrastructure available under the No Build Alternative. The lack of optimum transportation infrastructure could curtail business potential for increased production, thereby adversely affecting employment opportunities and associated personal income in the region. Any adverse economic impacts would likely result in long-term impacts that would be difficult to mitigate or counteract. This would be especially true, if a large business/employer were to choose not to locate, or expand operations, in Memphis due to the poor LOS along I-55 at the existing subject interchange. If such an employer were to choose another City outside of the region, it would adversely affect the local economy.

Even when combining the benefits of other past, present, and reasonably foreseeable transportation improvements in the region, it would be expected that not implementing the I-55 Interchange improvement project would be capable of resulting in adverse impacts to the local and regional economies. This is primarily due to I-55 being an important route to, from, and through the area, especially for trucks carrying freight and supplies.

Decreases in LOS on I-55 would have potential secondary impacts on other local roadways as drivers attempt to find alternative routes to avoid the highly congested I-55 Interchange. This increased traffic using local roadways would combine with any new traffic generated by other reasonably foreseeable developments in the project vicinity that may also require the use of local roadways for access. Overall decreases in LOS of local roadways could have adverse impacts to the local economy if it deters future development in an area. It is not possible to determine the extent of those impacts at this time, but it is anticipated that at least some adverse economic impacts would result under such conditions.

3.7.3 Potential Economic Impacts of Alternative A

3.7.3.1 Direct Impacts (Economic –Alternative A)

Both short-term and long-term beneficial and adverse economic impacts would occur under Alternative A. Short-term adverse impacts will occur due to a decrease in the real property tax base and real property tax revenues as a result of the eight residential and two business displacements. Based on the Shelby County Assessor of Property records Memphis and Shelby County real property tax revenue loss from these displacements will approximate $18,940 annually based on current county and city tax rates and the assessed valuations (year 2007) of the structure and associated land. Real property tax revenue would also be adversely impacted by the removal of small portions of additional properties from the tax rolls for ROW acquisition.

Additional tax revenue losses could also occur due to losses of business-related taxes (e.g., sales, utility, inventory taxes, etc.). However, the tax revenue losses may only be temporary (i.e., limited to the construction phase of the project) if the displaced businesses relocate within the project vicinity. Other short-term adverse economic impacts would include relocation expenses and the temporary loss of business income during the relocation period. Employees of the displaced businesses may become temporarily unemployed during the relocation period, unless the displaced businesses can utilize them or place them at a temporary location during that period. It is expected that the businesses would be able to locate within the general project vicinity, but if they choose not to reestablish the business, the employees would become unemployed.

Short-term beneficial impacts would be realized by employment associated with the construction of the I-55 Interchange. This new construction-related employment would create additional personal

income for the local and regional purchase of consumer goods and services during the construction period, which would most likely occur intermittently over a period of several years.

Over the long term, the economic impacts of this project would be beneficial both locally and regionally. Travel benefits would include decreased travel times, lower operating expenses, and reduced crash rates for both local daily commuters and travelers passing through the area. The project would also result in improved access to the Memphis area providing benefits to local businesses whose customers utilize the I-55 Interchange area. Manufacturing companies that rely on I-55 to transport goods to and from the Memphis area would likely receive additional savings due to more efficient travel through the area, which would reduce delivery time and fuel consumption.

3.7.3.3 Indirect Impacts (Economic –Alternative A)

Indirect short-term beneficial impacts would be realized from the additional jobs created both on- and off-site during construction and project development. Indirect employment would result in the form of jobs associated with the provision of supportive goods, supplies, and services necessary for the construction phase of the project. This creation of indirect employment would result in additional indirect personal income for the purchase of goods and services within the region.

It is possible that the I-55 Interchange improvements may promote additional commercial, industrial, and/or residential development, especially in the southern and western portions of Memphis in addition to that which is already planned or anticipated. New development would likely result in long-term economic benefits for the local and regional economies.

As new development occurs in the project vicinity, property values may increase. Some of the abandoned industrial properties located north and east of the project area may become more attractive, if access to the area is improved. This would make these areas more valuable. Property values for some locations outside of the immediate project area may also be somewhat impacted by the project, if additional residential developments are needed to supply housing for the additional workforce that would be needed to support any new or expanded industrial development in the area. Areas once perceived as too far from downtown Memphis may become more attractive as commuters may be able to drive the extra distances while maintaining similar commuting times as they currently encounter due to congestion.

Minor indirect impacts to local businesses and the local economy may occur in the short term due to loss of secondary business that may be generated by the two businesses being displaced. This would be especially true of the RV park located in the project area as its tenants likely patronize local businesses for their supplies, food, fuel, and other items. Assuming the displaced businesses are able and/or willing to relocate in the area, the impacts to the secondary businesses would be short term, as well.

3.7.3.4 Cumulative Impacts (Economic –Alternative A)

The proposed I-55 Interchange under Alternative A would create improved and expanded transportation services in the region by providing for a more efficient and safe route to travel within Memphis and between Memphis and other cities in the region. Optimum transportation infrastructure could increase business potential, thereby positively affecting employment opportunities and associated personal income in the region. The combination of all of the past, present, and future transportation improvements, revitalization of some of the former industrial areas, and other new residential, industrial, and commercial developments would result in continued economic growth in the region. Although some of this development would likely occur without the I-55 Interchange Improvements, it is likely that the project would increase the rate at which some of the development happens and may result in some development that otherwise would not have occurred.

Areas in West Memphis, Arkansas would likely receive some of the economic benefits that would occur due to this project, because some of the commercial, industrial, and residential development would likely occur on available properties in that area. The West Memphis area is conveniently juxtaposed to downtown Memphis and has the potential to provide commuters with easy access to the area. At the present time this access is compromised by the heavy congestion on I-55 primarily at the I-55 Interchange with E.H. Crump Boulevard and South Riverside Boulevard. Commuters would likely be more willing and able to travel the I-55 corridor through the project area to reach their destinations in Memphis once some of the existing traffic issues are resolved by improving the interchange.

The ongoing and future businesses being promoted by the Memphis Regional Chamber, Memphis Center City Commission in the Central Business Improvement District, and by the President's Island Industrial Association would experience long-term beneficial cumulative economic impacts. No other reasonably foreseeable future projects were identified in the cumulative impact analysis area that could provide measurable cumulative economic impacts.

3.7.4 Potential Economic Impacts of Alternative B

3.7.4.1 Direct Impacts (Economic –Alternative B)

Direct economic impacts of Alternative B would be essentially the same as those of Alternative A, except it is possible that one less business would be displaced by the project. Therefore, there would be a slight decrease in the amount of real property tax base and real property tax revenues that could be lost as a result of the business displacements. Assuming the Southern Cotton Ginners Association would not need to be displaced, the short-term property tax loss from displacements under Alternative B would be $14,164 annually based on Shelby County Assessor of Property records (year 2007).

Alternative B would eliminate the current direct access to Metal Museum Drive, which would eliminate some current through traffic in the local neighborhood, but would also adversely affect the commuting options of the local residents. These impacts would be considered long term but minor to local residents. Consumer access to some local businesses off of Metal Museum Drive would be adversely affected.

3.7.4.2 Indirect Impacts (Economic –Alternative B)

Indirect economic impacts of Alternative B would be the same as Alternative A, except one less business may be impacted by Alternative B. If the Southern Cotton Ginners Association office is not displaced, there would be fewer short-term indirect impacts associated with loss of business during construction. Also, secondary business that is generated by employees or visitors to the Southern Cotton Ginners Association facilities would continue to provide income for other area businesses. Therefore, the potential for adverse economic impacts would be slightly reduced compared to Alternative A.

3.7.4.3 Cumulative Impacts (Economic –Alternative B)

Cumulative Impacts associated with Alternative B would be the same as those discussed under Alternative A except that Alternative B would eliminate the current direct access to Metal Museum Drive. This would eliminate some current through traffic in the local neighborhood, but would also adversely affect the commuting options of the local residents. These impacts would be considered long term but minor to local residents. The cumulative impact from the I-55 Interchange project coupled with likely improvements in the neighboring industrial areas would result in long-term beneficial cumulative impacts to the economy.

3.7.5 Mitigation

The overall economic benefits the improved I-55 Interchange would provide to the local and regional economy in the long term would mitigate potential short-term adverse impacts. The improvements

would provide for better access to existing properties in the project area that are currently limited due to traffic congestion issues at the current interchange. This improved access and traffic flow may promote additional development and economic growth in the immediate project area and for the region in general.

The State's Relocation Assistance Program will be utilized to ensure to the maximum extent possible the prompt and equitable relocation and reestablishment of businesses displaced as a result of this project. The Relocation Assistance Program helps to ensure that displaced parties do not suffer disproportionate harm as a result of programs designed to benefit the public as a whole.

The relocation of displaced businesses will be administered in accordance with the provisions and procedures of the Tennessee Uniform Relocation Assistance Act of 1972, and the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Public Law 91-646).

3.8 Pedestrians and Bicyclists Considerations

3.8.1 Affected Environment

The Build Alternatives for this project do not currently include adding facilities for pedestrians or bicycles such as sidewalks or bike lanes as this project is being designed primarily for interstate traffic. The proposed alignments would not sever existing routes for non-motorized vehicle or pedestrian traffic.

Alternative A would provide a direct connection between Illinois Avenue and Crump Boulevard by including an underpass under I-55. This underpass would provide a direct connection to downtown Memphis for residents and businesses in the French Fort neighborhood and areas to the south and west. There is potential that sidewalks or bicycle lanes could be added to this new connection unless it is determined to be a safety issue. Provision of bicycle or pedestrian accommodations will be determined during the final design phase of the project. Maintaining direct access to the French Fort neighborhood and surrounding areas via the exit ramp from Southbound I-55 to Illinois Avenue under Alternative A would result in additional through traffic in the local neighborhood, which could reduce safety for pedestrians and bicycles in the vicinity. However, the current facilities already provide access to the general area for traffic leaving I-55 so no measurable impacts, in terms of pedestrian and bicycle safety, would be expected if Alternative A were implemented.

Alternative B would eliminate the current direct access to the French Fort neighborhood from southbound I-55 to Alston Avenue and would therefore eliminate some current through traffic and result in potential increased safety for pedestrians and bicyclists. The proposed ramp connecting southbound I-55 to eastbound Crump Boulevard would not be expected to provide pedestrian or bicycle access due to safety concerns. Therefore, no measurable impacts would be anticipated for pedestrian and bicycle facilities under Alternative B.

3.9 Air Quality

3.9.1 Affected Environment

3.9.1.1 Regulations

The Clean Air Act (CAA), which was last amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The EPA Office of Air Quality Planning and Standards has set NAAQS for six principal pollutants as shown in Table 3.11. These six are called criteria pollutants. Areas in which air pollution levels persistently exceed the NAAQS may be designated as "nonattainment". States in which a nonattainment area is located must develop and implement a State Implementation Plan (SIP) containing policies and regulations that will bring about attainment of the NAAQS.

3.9.1.2 Existing Air Quality

In 1991, the EPA designated Shelby County, Tennessee, a moderate nonattainment area for carbon monoxide (CO) and a marginal nonattainment area for ozone. Due to improvement in the ambient air quality, the EPA redesignated Shelby County to attainment for CO on August 31, 1994 and for ozone on February 16, 1995.

In April 2004, the EPA designated Memphis as an 8-hour ozone moderate nonattainment area (69 FR 23858). Included in this designation are two counties: Shelby County, Tennessee, and Crittenden County, Arkansas. On September 15, 2004, the EPA reclassified the area from moderate to marginal. The reclassification means that the area is expected to achieve clean air sooner. An earlier 1-hour ozone standard was revoked on June 15, 2005. In 1978 the EPA designated Memphis, Tennessee a moderate (less than 12.7 ppm) non-attainment area for carbon monoxide (CO), with regard to the NAAQS. Due to improvements in ambient air quality, EPA redesignated Shelby County to attainment for the CO standard on August 31, 1994. Memphis' attainment status for CO was revisited in the 10 year maintenance plan for CO and the motor vehicle emission budget (MVEB) contained in it. In addition to a new budget value established for the MVEB in the 10-year plan, the last year of the plan is now 2017.

In 2006, there were three ozone monitoring stations located in Shelby County. Monitoring data for these sites was obtained from the EPA AirData website (http://www.epa.gov/air/data/index.html). To attain the 8-hour ozone standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 parts per million (ppm). In 2006, the fourth-highest daily maximum 8-hour average exceeded 0.08 ppm at two of the three ozone monitoring stations in Shelby County.

3.9.1.3 Conformity

The EPA's "Transportation Conformity Regulations" were updated in January 2008. The 1990 Clean Air Act Amendments (CAAAs) and the Tennessee Transportation Conformity Rule require that each new regional Long-Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP) must be demonstrated to conform to the Tennessee State Implementation Plan (SIP). In August 2007, the Memphis MPO Transportation Policy Board approved the FY 2008-2011 TIP. The Memphis Urban Area 2030 LRTP was approved by the Memphis MPO Transportation Policy Board in March 2008.

The previous conformity determination conducted by the Memphis MPO was approved by the U.S. DOT on May 12, 2005. This conformity analysis considered projects from the 2026 Long Range Transportation Plan Amendments and the 2004-2006 Transportation Improvement Program (TIP), both of which included the I-55 Interchange Project being studied in this EIS. Neither the scope nor design of the I-55 Interchange project have changed since the May, 12, 2005 conformity determination.

According to the July 2004 Companion Guidance, states in a multi-state area have the option of submitting SIPs with budgets for just their own portion of the area that, when taken together, meet the applicable Clean Air Act requirement. Where states have done so and EPA has found such budgets adequate, the MPO or MPOs in each state with such budgets can determine conformity independently of the other states (Companion Guidance for the July 1, 2004, Final Transportation Conformity Rule: Conformity Implementation in Multi-jurisdictional Nonattainment and Maintenance Areas for

Existing and New Air Quality Standards). Shelby County has budgets of its own. Crittenden County (AR) does not have budgets. After extensive interagency consultation, both counties agreed that it is best to perform this conformity demonstration independently. Therefore, the conformity determination is only for the Shelby County portion of the 8-hour ozone non-attainment area. Crittenden County is an attainment area for CO pollutant.

After utilizing the Travel Demand Model and MOBILE6.2 to obtain the necessary input factors, total emissions were calculated for the ozone precursor pollutants volatile organic compounds (VOCs) and nitrogen oxides (NOx) as well as for carbon monoxide (CO). As a result of this analysis, it was determined that all pollutants fall within their established SIP and federally-established motor vehicle emission budgets. Therefore, it was determined that the FY 2008-2011 TIP and the Memphis Urban Area 2030 Long-Range Transportation Plan conform under the 8-hour ozone and CO NAAQS. The I-55 Interchange project is included in the Memphis Urban Area 2030 Long-Range Transportation Plan.

3.9.1.4 Microscale Carbon Monoxide Hot-Spot Analysis

Since carbon monoxide is a site-specific pollutant, with its major concentrations generally found immediately adjacent to roadways, it is usually of concern on a local or microscale basis. Therefore, the study of air quality impacts as a result of project-generated traffic is typically evaluated through a microscale analysis of traffic-related CO levels. The microscale air quality analysis for this study evaluated local CO levels at receptor sites located adjacent to the project area. Carbon monoxide was selected as the air pollutant indicator to be evaluated for this project, because automobiles and trucks are major sources of CO emissions. Ozone is not a concern at the microscale level, because it is a regional pollutant that is analyzed as part of the State Implementation Plan development and conformity process. In addition, ozone, unlike CO, is reactive in that it results from a chemical interaction between volatile organic compounds (VOCs) and oxides of nitrogen (NO_x). Meteorology plays a key role in the concentration and dispersion of ozone.

Microscale CO concentrations are estimated through the use of computerized mathematical models (MOBILE6 and CAL3QHC) since data on street level CO concentrations is not available for most projects. The carbon monoxide microscale dispersion analysis conducted is consistent with the latest mobile source emissions factors issued by the EPA known as MOBILE6 and Conformity Regulations dated November 11, 1993 (40 CFR Part 93). The CAL3QHC model, Version 2.0 (USEPA, 1992), is the model used for the microscale analysis.

Using these models, CO levels were calculated for the peak one-hour period to determine the potential highest CO concentrations for Build Alternatives A and B. A default background CO concentration of 3.2 ppm was used (i.e., the highest concentration recorded at an air quality monitoring site in Shelby County in 2006). Carbon monoxide concentrations were calculated for receptors for the years 2012 (base year) and 2032 (design year). For this analysis, receptors were located along I-55 and Illinois Avenue.

For both Build Alternatives, the maximum future one-hour CO concentrations are projected to be 5.3 ppm in 2012 and 5.4 ppm in 2032. These are well below the NAAQS one-hour standard of 35.0 ppm. The highest projected CO concentrations are located along the proposed right-of-way of I-55. Since the highest projected one-hour concentration is lower than the eight-hour NAAQS of 9.0 ppm, calculation of eight-hour concentrations is not required for this project.

Table 3.11. Summary of National Primary Ambient Air Quality Standards.

Pollutant	Primary Standard	Averaging Time	Secondary Standard
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour[(1)]	None
	35 ppm (40 mg/m^3)	1-hour[(1)]	None
Lead	1.5 µg/m^3	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM_{10})	Revoked[(2)]	Annual[(2)] (Arith. Mean)	
	150 µg/m^3	24-hour[(3)]	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual[(4)] (Arith. Mean)	Same as Primary
	35 µg/m^3	24-hour[(5)]	
Ozone	0.08 ppm	8-hour[(6)]	Same as Primary
	0.12 ppm	1-hour[(7)] (Applies only in limited areas)	Same as Primary
Sulfur Oxides	0.03 ppm	Annual (Arith. Mean)	-------
	0.14 ppm	24-hour[(1)]	-------
	-------	3-hour[(1)]	0.5 ppm (1300 µg/m^3)

[(1)] Not to be exceeded more than once per year.
[(2)] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard in 2006 (effective December 17, 2006).
[(3)] Not to be exceeded more than once per year on average over 3 years.
[(4)] To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.
[(5)] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).
[(6)] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
[(7)] (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is $\leq$ 1.
(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

3.9.1.5 Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, the EPA examined the impacts of existing and newly promulgated mobile source control programs, including

its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

The Clean Air Act identified 188 air toxics, also known as hazardous air pollutants. The Environmental Protection Agency (EPA) has assessed this expansive list of toxics and selected a group of 21 that it considers mobile source air toxics (MSATs). More recently, the agency has extracted a subset of this list of 21 and developed what the EPA now labels the six priority MSATs. These are benzene formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-buadiene. While the EPA has identified these as the higher priority MSATs, the agency has not proposed to establish ambient standards for any of these pollutants.

The EPA issued a final rule on *Control of Emissions of Hazardous Air Pollutants from Mobile Sources* (66 FR 17235) in March 2001 under provisions of the Clean Air Act requiring EPA to characterize, prioritize, and control these emissions as appropriate. In addition to highlighting the 21 MSATs, the final rule summarized the mobile sources contribution to national inventories of hazardous air pollutants. Since MSATs can be loosely defined as volatile organic compounds, nonvolatile organics, diesel particulate matter/diesel exhaust gasses, or metals, the linkage with transportation vehicles and fuels is direct.

The EPA has issued a number of regulations that will dramatically decrease MSATs through cleaner fuels and cleaner engines. According to a FHWA analysis, even if U.S. Annual Vehicle Miles Traveled (VMT) increases by 64 percent, reductions 57 percent to 87 percent in MSATs are projected from 2000 to 2020 (EPA, 2006). Despite national trend information on MSATs, reductions, many questions remain unanswered about the overall health risk of these air toxics. In particular, the tools and techniques for assessing project-specific health impacts from MSATs are limited. These limitations impede the FHWA's ability to evaluate how mobile source health risks should factor into project-level decision-making under NEPA. In addition, the EPA has not established regulatory concentration targets for the six priority MSAT pollutants appropriate for use in the project development process.

Unavailable Information for Project Specific MSAT Impact Analysis

The EIS for the I-55 Interchange project includes a basic analysis of the likely MSAT emission impacts for the project. However, available technical tools do not provide the ability to predict the project-specific health impacts of the emission changes associated with the alternatives carried forward in this EIS. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Information that is Unavailable or Incomplete

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical

shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

- **Emissions**: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model–emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of Particulate Matter (PM) under the conformity rule, EPA has identified problems with MOBILE 6.2 as an obstacle to quantitative analysis. These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE 6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.
- **Dispersion**: The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.
- **Exposure Levels and Health Effects**: Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis prevent the ability to make meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between

alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from the EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- Benzene is characterized as a known human carcinogen.
- The potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- Formaldehyde is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- 1,3-butadiene is characterized as carcinogenic to humans by inhalation.
- Acetaldehyde is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- Diesel exhaust (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.
- Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

Additionally, the following are identified by the EPA as non-cancer health endpoints of potential concern:

- Benzene (decreased lymphocyte count)
- Acrolein (nasal lesions)
- Formaldehyde (respiratory)
- 1,3-butadiene (ovarian atrophy)
- Acetaldehyde (degeneration of the olfactory epithelium)

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by the EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes– particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based Upon Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects. Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

In this document, FHWA has provided a qualitative analysis of MSAT emissions relative to the various alternatives, and has acknowledged that the project alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

Mobile Source Air Toxics (MSAT) Qualitative Assessment

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions–if any– from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives,* found at:

www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm

For each alternative in this EIS, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No-Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the I-55 Interchange under the Build Alternatives, along with a corresponding decrease in MSAT emissions along the other routes or secondary routes currently used to bypass the highly congested portions of I-55 near the existing I-55/E.H. Crump Boulevard Interchange. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated VMT under each of the alternatives are nearly the same, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the project area are likely to be lower in the future in nearly all cases.

The additional travel lanes and proposed realignment contemplated as part of the project Build Alternatives will have the effect of moving some traffic closer to nearby homes and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSATs could be higher under certain Build Alternatives than the No-Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded and realigned roadway sections that would be built as part of Alternatives A and B. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models. When a highway is widened and realigned, and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-Build Alternative. However, this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be substantially lower than present levels.

3.9.1.6 Global Warming

FHWA's current approach on the issue of global warming is summarized in this section. To date, no national standards have been established regarding greenhouse gases, nor has EPA established criteria or thresholds for greenhouse gas emissions. On April 2, 2007, the Supreme Court issued a decision in Massachusetts et al v. EPA et al that the EPA does have authority under the CAA to establish motor vehicle emissions standards for CO2 emissions. The EPA is currently determining the implications to national policies and programs as a result of the Supreme Court decision. However, the Court's decision did not have any direct implications on requirements for developing transportation projects.

FHWA does not believe it is informative at this point to consider greenhouse gas emissions in an EIS. The climate impacts of CO2 emissions are global in nature. Analyzing how alternatives evaluated in an EIS might vary in their relatively small contribution to a global problem will not better inform decision-makers. Further, due to the interactions between elements of the transportation system as a whole, emissions analyses would be less informative than ones conducted at regional, state, or national levels. Because of these concerns, FHWA concludes that they cannot usefully evaluate CO2 emissions in this EIS in the same way that we address other vehicle emissions.

FHWA is actively engaged in many other activities with the DOT Center for Climate Change to develop strategies to reduce transportation's contribution to greenhouse gases, particularly CO2 emissions, and to assess the risks to transportation systems and services from climate change. FHWA will continue to pursue these efforts as productive steps to address this important issue. FHWA will review and update its approach to climate change at both the project and policy level as more information emerges and as policies and legal requirements evolve.

3.9.2 Potential Air Quality Impacts of the No-Build Alternative

This EIS includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impact of emission changes associated with the construction of the new six-lane highway. Due to these limitations, discussion in accordance with CEQ regulations [40 CFR 1502.22(b)] regarding incomplete or unavailable information has also been included in this EIS.

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives,* found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm

Under the No Build Alternative, the amount of MSATs emitted would be proportional to VMT. Over a long period of time, MSATs would be expected to decrease in the immediate area due to implementation of the EPA's vehicle and fuel regulations despite increases in ADT. On a regional basis, MSATs under this alternative would be higher than those expected under The Build Alternatives due to the continued increase in traffic congestion.

Under the Build Alternatives, operation of construction vehicles would result in short-term, localized increases in MSATs along new roadway sections. In addition, the amount of MSATs emitted would be proportional to VMT. The VMT estimated for the Build Alternatives is higher than that for the No Build Alternative, because the additional capacity of the improved highway would increase traffic efficiency and may attract rerouted trips from elsewhere in the Memphis and West Memphis transportation network. This increase in VMT would lead to a localized higher MSATs emitted for

the Build Alternatives along the improved highway. However, these increases would be reduced in the future due to the implementation of the EPAs vehicle and fuel regulations.

According to the EPA's MOBILE6 emissions model, emissions of all the priority MSATs, except for diesel particulate matter, decrease as speed increases. Upon completion of the interchange improvements, traffic flow in and around the Memphis and West Memphis transportation network would be more efficient resulting in increased speeds and an immediate reduction in MSATs emitted on a regional level. In addition to these immediate reductions, MSATs would continue to be reduced in the future due to the implementation of the EPA's vehicle and fuel regulations.

3.9.2.1 Direct Impacts (Air Quality –No-Build Alternative)

If the No-Build Alternative were selected, it is anticipated that local air quality may be adversely impacted as LOS would continue to decline and traffic congestion would continue to increase. Increased emissions from vehicles forced to idle in the area would result in potential health risks for adjacent residents. However, the extent of those risks can not be predicted at this time.

It is likely that in the long-term, there would be some reduction in MSAT levels due to new EPA regulations and eventual fleet turnover that would provide for cleaner engines and fewer MSAT emissions. However, with no improvement to the traffic flow in the I-55 Interchange area, it is likely that at least some potential adverse air quality impacts would occur throughout the reasonably foreseeable future.

3.9.2.2 Indirect Impacts (Air Quality –No-Build Alternative)

If no improvements were made to help reduce traffic congestion at the existing I-55 Interchange, it is likely that some long-term adverse air quality impacts would occur, at least locally and possibly regionally. Continued decreases in LOS on I-55 at the existing interchange would eventually result in more traffic being forced to utilize other routes in the area resulting in potential decreased LOS on those alternative routes as well as increased VMT. Decreased LOS on other routes would likely eventually result in increased traffic congestion in those other areas. This could result in additional areas being exposed to increased vehicle emissions due to congestion. Also, use of alternative routes would result in additional VMT than would otherwise be necessary if improvements were made at the existing I-55 Interchange to help reduce congestion. Increased VMT would result in potential increases in air quality impacts.

3.9.2.3 Cumulative Impacts (Air Quality –No-Build Alternative)

It is anticipated that adverse impacts to air quality would occur if no improvements were made to the existing I-55 Interchange because traffic conditions would continue to deteriorate. Reduced LOS on the existing roadway would combine with potential increased traffic volumes generated by continued regional urban growth and increases in truck traffic. Even if other planned transportation improvements are implemented as planned around the region, potential adverse regional air quality impacts would be anticipated if the I-55 Interchange is not improved. This is because I-55 is a major corridor that carries a substantial amount of traffic, especially trucks, through the region. The existing cloverleaf ramps result in congestion and force traffic to continuously transition between deceleration, idling, and acceleration resulting in increased emissions.

3.9.3 Potential Air Quality Impacts of Alternative A

3.9.3.1 Direct Impacts (Air Quality –Alternative A)

This project is not expected to cause or contribute to any violation of the NAAQS. The maximum future one-hour CO concentrations for Alternative A are projected to be 5.3 ppm in 2012 and 5.4 ppm in 2032. These are well below the NAAQS one-hour standard of 35.0 ppm. The highest projected CO concentrations are located along the proposed ROW of I-55. Since the highest projected one-

hour concentration is lower than the eight-hour NAAQS of 9.0 ppm, calculation of eight-hour concentrations was not required for this project.

The amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for Alternative A is slightly higher than that for the No-Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for Alternative A along the I-55 Corridor, along with a corresponding decrease in MSAT emissions along the secondary routes currently used to avoid the congestion at the existing I-55/E.H. Crump Boulevard Interchange. The emissions increase would be offset somewhat by lower MSAT emission rates due to increased speeds, because according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Regardless of the alternative chosen for this project, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the project area are likely to be lower in the future in nearly all cases.

The additional travel lanes and proposed realignment contemplated as part of Alternative A will have the effect of moving some traffic closer to nearby homes and businesses; therefore, there may be localized areas where ambient concentrations of MSATs could be higher than the No-Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded and realigned roadway sections that would be built. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models. When a highway is widened and realigned, and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-Build Alternative. However, this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be substantially lower than present levels.

Overall, this project alone is not expected to result in any substantial impacts to air quality.

3.9.3.2 Indirect Impacts (Air Quality –Alternative A)

Implementation of Alternative A may result in minor secondary impacts to air quality in terms of relieving traffic congestion on secondary roads used to bypass the existing Interchange. Improvements to the interchange could promote secondary developments in and around the project area which could result in additional impacts to air quality. Most of those impacts would likely be considered short-term due to construction equipment exhaust, dust, and other construction related activities. Secondary developments may increase the amount of traffic in the area which could eventually influence air quality if new areas of traffic congestion result. Such impacts can not be predicted accurately at this time. However, due to the EPA vehicle and fuel regulations, coupled with fleet turnover, it is likely that air quality impacts would be minor.

3.9.3.3 Cumulative Impacts (Air Quality –Alternative A)

The improvements to traffic flow resulting from the I-55 Interchange project would likely result in overall improvements to air quality when combined with other past, present, and reasonably foreseeable transportation projects and changes in EPA vehicle and fuel regulations. Overall regional air quality is expected to improve into the future even with additional development expected in the area.

3.9.4 Potential Air Quality Impacts from Alternative B

3.9.4.1 Direct Impacts (Air Quality –Alternative B)

Air quality impacts associated with Alternative B would be essentially the same as those discussed for Alternative A.

3.9.4.2 Indirect Impacts (Air Quality –Alternative B)

Indirect air quality impacts associated with Alternative B would be essentially the same as those discussed for Alternative A.

3.9.4.3 Cumulative Impacts (Air Quality –Alternative B)

Cumulative impacts to air quality associated with Alternative B would be essentially the same as those discussed for Alternative A.

3.9.5 Mitigation

No violations of the NAAQS are projected for this project. Therefore, no air quality mitigation measures are required for the project improvements.

During construction the contractor must comply with all federal, state, and local laws and regulations governing the control of air pollution. Adequate dust-control measures would be maintained so as not to cause detriment to the safety, health, welfare, or comfort of any person or cause any damage to any property or business.

Demolition and construction activities can result in short-term increases in fugitive dust and equipment-related particulate emissions in and around the project area. (Equipment-related particulate emissions can be minimized if the equipment is well maintained.) The potential air quality impacts would be short-term, occurring only while demolition and construction work is in progress and local conditions are appropriate. The potential for fugitive dust emissions typically is associated with building demolition, ground clearing, site preparation, grading, stockpiling of materials, on-site movement of equipment, and transportation of materials. The potential is greatest during dry periods, periods of intense construction activity, and during high wind conditions.

Dust and airborne dirt generated by construction activities would be controlled through dust control procedures or a specific dust control plan, when warranted. The contractor and TDOT will meet to review the nature and extent of dust-generating activities and would cooperatively develop specific types of control techniques appropriate to the specific situation. Techniques that may warrant consideration include measures such as minimizing track-out of soil onto nearby publicly-traveled roads, reducing speed on unpaved roads, covering haul vehicles, and applying chemical dust suppressants or water to exposed surfaces, particularly those on which construction vehicles travel. With the application of appropriate measures to limit dust emissions during construction, this project would not cause any short-term particulate matter air quality impacts.

3.10 Noise

3.10.1 Affected Environment

3.10.1.1 Regulations

The Federal Aid Highway Act of 1970 established the requirement that noise control be a part of the planning and design of all federally-aided roadways. The FHWA has developed guidelines for conducting noise studies and has established noise abatement criteria for different land use activity categories. FHWA guidelines are set forth in 23 CFR 772. Noise impacts for this project were evaluated in accordance with FHWA noise assessment guidelines.

3.10.1.2 Noise Assessment Guidelines

Traffic noise levels are expressed in terms of the hourly, A-weighted equivalent sound level in decibels (dBA). The A-weighted sound level is a single number measure of the sound intensity with weighted frequency characteristics that correspond to a human's response to noise. However, because most environmental noise fluctuates from moment to moment, it is common practice to condense information into a single number called the equivalent sound level (L_{eq}). The L_{eq} is the value of a steady sound level that represents the same sound energy as the actual time-varying sound evaluated over the same time period. For traffic noise assessment, L_{eq} is typically evaluated over a one-hour period and is denoted in $L_{eq}(h)$.

Within the urban and rural environment, noise generated by vehicular traffic is one of the most substantial of the common noises because of its prevalence and its intensity or loudness. The increase in noise levels that accompany the routing of high volumes of automobiles and truck traffic onto expressway facilities, which are located in areas of diversified land use, necessitates that a quantitative environmental noise impact analysis be conducted during the planning and design stages.

A highway noise impact would occur when predicted noise levels approach (1 dBA less than the criteria), equal, or exceed the FHWA Noise Abatement Criteria (NAC) shown on Table 3.12. Also, TDOT has defined a substantial increase in existing noise levels to be greater than 10 dBA. Highway traffic noise impacts would also occur if there is a substantial increase in design year noise levels above the existing noise levels when the predicted design year noise levels are between 57 and 66 dBA Leq. The criteria for a noise level increase are shown on Table 3.13.

Table 3.12. Noise Abatement Criteria.

Activity Category	L_{eq}(h) (dBA)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic area, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.
Source: 23 Code of Federal Regulations Part 772		

Table 3.13. Noise Level Impacts.

Increase (dBA)	Subjective Description
0 – 5	Minor Increase
6 – 9	Moderate Increase
More than 10	Substantial Increase
Source: TDOT Policy on Highway Traffic Noise Abatement	

Federal guidance for the identification of highway traffic noise impacts is contained in 23 CFR Part 722. Predicted noise levels have been compared to existing levels and to the Federal Noise Abatement Criteria to determine the impact of highway-generated noise on the population in the vicinity of the project Build Alternatives. The results of this comparison are shown later in this section on Table 3.15.

3.10.1.3 Existing Noise Levels

Noise measurements were taken in the project area to identify existing background L_{eq}, A-weighted sound levels. These noise level readings were used to confirm modeled existing noise levels were reasonable. Noise levels recorded for this project are listed in Table 3.14.

Table 3.14. Existing Noise Levels.

Location	Noise Level (dBA)
1055 Esplanade Place	58
1098 Esplanade Place	58
221 Rampart Place	59
1111 Esplanade Place	60
215 Chartres Place	57
217 Napolean Place	57
188 Napolean Place	58
241 Illinois Avenue	55
207 Illinois Avenue	60
1055 Deumaine Place	57
1072 Deumaine Place	60
1066 Bourbon Place	56
922 Riverside Boulevard	54
Abandoned Hotel	67
Metal Museum Drive	62
Channel 3 Drive	56
United Warehouse	69

3.10.1.4 Predicted Noise Level

With the utilization of the most recent traffic forecasts available, design year 2032 peak-hour traffic levels were predicted at various representative locations along the two Build Alternatives. The Federal Highway Traffic Noise Prediction Model (TNM), version 2.5, was used to predict these levels.

In general, a doubling (or halving) of the receptor distance from the noise source produces a decrease (or increase) of three to five dBA. A change of three decibels or less is not readily perceptible to the average human ear, while an increase of 10 dBA is equivalent to an apparent doubling of the sound.

A total of 68 sensitive receptors were modeled as part of this study. All of the receptors analyzed are single family residences located in the French Fort Neighborhood. Existing noise levels were estimated with computer modeling at these receptors. Figure 3.3 shows the locations of the receptors that were analyzed for the noise study. The existing estimated noise levels range from 58 to 74 dBA. As shown on Table 3.15, the 67 dBA noise criterion is approached or exceeded at 20 of the receptors analyzed.

Table 3.15 identifies the number of sensitive receptors that would experience traffic noise impacts for existing, No-Build, and Build Alternatives. Based on the noise analysis conducted for this project, the No-Build Alternative would result in 21 impacts, while Alternatives A and B would result in 39 and 37 impacts, respectively.

Figure 3.3. Locations of Noise Receptors Analyzed for Determine Noise Impacts for the I-55 Interchange Project in Memphis, Tennessee.

Table 3.15. Predicted Noise Levels (in dBA) and Noise Impacts.

	Existing		No-Build Alternative			Alternative A			Alternative B		
Receiver	Noise Level	Impact	Noise Level	Change vs. Existing	Impact	Noise Level	Change vs. Existing	Impact	Noise Level	Change vs. Existing	Impact
101	62.9		64.1	1		70.0	7	X	70.4	8	X
102	62.2		63.5	1		69.3	7	X	69.1	7	X
103	61.7		62.9	1		68.5	7	X	67.9	6	X
104	61.2		62.5	1		67.9	7	X	66.9	6	X
105	60.9		62.2	1		67.2	6	X	66.2	5	X
106	60.6		61.9	1		66.3	6	X	65.6	5	
107	63.7		65.0	1		70.5	7	X	70.9	7	X
108	62.7		64.0	1		69.3	7	X	69.4	7	X
110	61.2		62.5	1		67.2	6	X	66.8	6	X
111	60.6		61.9	1		66.4	6	X	65.8	5	
112	60.0		61.3	1		65.6	6		65.0	5	
113	59.6		60.9	1		65.0	5		64.3	5	
109	61.9		63.2	1		68.3	6	X	68.2	6	X
114	70.2	X	71.6	1	X	73.2	3	X	73.8	4	X
115	68.9	X	70.4	2	X	73.5	5	X	73.5	5	X
116	63.6		65.1	1		68.9	5	X	68.9	5	X
117	62.9		64.3	1		67.8	5	X	67.7	5	X
118	62.4		63.8	1		67.6	5	X	67.4	5	X
119	60.5		61.8	1		65.7	5		65.3	5	
120	60.4		61.8	1		65.4	5		65.2	5	
121	65.9		67.3	1	X	70.6	5	X	70.7	5	X
122	62.2		63.6	1		67.3	5	X	67.3	5	X
123	59.9		61.3	1		65.0	5		64.9	5	
124	74.4	X	75.9	2	X	74.9	1	X	74.9	1	X
125	61.5		62.9	1		66.4	5	X	66.3	5	X
126	63.2		64.7	2		67.6	4	X	67.6	4	X
127	72.5	X	73.9	1	X	74.0	2	X	74.0	2	X
128	72.5	X	74.0	2	X	74.3	2	X	74.4	2	X
130	59.4		60.8	1		64.1	5		64.1	5	
131	60.2		61.6	1		64.6	4		64.6	4	
132	70.5	X	72.0	2	X	72.4	2	X	72.4	2	X
133	61.5		63.0	2		64.7	3		64.6	3	
134	62.5		64.0	2		65.8	3		65.8	3	
135	59.4		60.9	2		63.0	4		62.9	4	
136	60.2		61.6	1		63.3	3		63.3	3	
137	66.8	X	68.3	2	X	68.6	2	X	68.7	2	X
138	63.4		64.9	2		65.5	2		65.5	2	
139	64.5		65.9	1		66.3	2	X	66.3	2	X
140	66.2	X	67.6	1	X	67.9	2	X	67.9	2	X
141	68.1	X	69.5	1	X	69.6	2	X	69.7	2	X

Table 3.15. Predicted Noise Levels (in dBA) and Noise Impacts.

	Existing		No-Build Alternative			Alternative A			Alternative B		
Receiver	Noise Level	Impact	Noise Level	Change vs. Existing	Impact	Noise Level	Change vs. Existing	Impact	Noise Level	Change vs. Existing	Impact
142	69.1	X	70.5	1	X	70.6	2	X	70.6	2	X
143	71.5	X	72.9	1	X	72.9	1	X	73.0	2	X
144	71.6	X	73.0	1	X	73.1	2	X	73.1	2	X
145	72.3	X	73.7	1	X	73.8	2	X	73.8	2	X
146	72.7	X	74.2	2	X	74.2	2	X	74.3	2	X
147	72.4	X	73.8	1	X	73.9	2	X	73.9	2	X
148	72.5	X	74.0	2	X	74.0	2	X	74.1	2	X
149	72.2	X	73.7	2	X	73.7	2	X	73.8	2	X
150	70.2	X	71.7	2	X	71.7	2	X	71.8	2	X
151	69.9	X	71.4	2	X	71.4	2	X	71.4	2	X
152	66.4	X	67.8	1	X	67.9	2	X	67.9	2	X
153	62.6		64.1	1		64.1	1		64.2	2	
155	62.6		64.1	1		64.3	2		64.3	2	
156	63.0		64.5	2		64.6	2		64.7	2	
157	63.5		64.9	1		65.0	2		65.1	2	
158	63.8		65.3	2		65.4	2		65.4	2	
159	64.1		65.6	2		65.6	2		65.7	2	
160	64.1		65.6	2		65.6	2		65.7	2	
161	62.6		64.1	1		64.1	1		64.2	2	
154	61.8		63.2	1		63.5	2		63.5	2	
129	59.1		60.5	1		63.9	5		63.8	5	
162	60.3		61.7	1		65.5	5		65.1	5	
163	60.0		61.4	1		64.8	5		64.5	5	
164	58.4		59.7	1		63.2	5		62.9	5	
165	59.0		60.5	2		61.4	2		61.4	2	
166	59.9		61.3	1		61.9	2		61.9	2	
167	61.0		62.5	2		62.6	2		62.6	2	
168	61.6		63.0	1		63.1	2		63.2	2	

***Note**: 1. A noise impact is identified where the predicted 2032 noise level is 66 dBA or above or if the predicted noise level is 10 dBA greater than existing conditions.*

2. Existing noise levels shown in this table are from modeled results.

3.10.1.5 Noise Abatement

Consideration should be given to possible noise abatement measures for the receptors that are adversely affected by traffic noise associated with the project. TDOT would consider the following noise abatement measures: (1) traffic management measures, (2) alteration of horizontal and vertical alignments, and (3) construction of noise barriers.

Abatement measures were considered for each of the Build Alternatives. Traffic management, creation of buffer zones, and noise walls were considered as abatement measures.

Traffic management measures that can be used to modify the traffic noise source include prohibition of heavy trucks and the reduction of speed limits. The prohibition of heavy trucks would not be practical since I-55 would be a major route that serves industry, commercial developments, and interstate transportation. Lowering the speed limit would reduce the LOS and thereby increase delay, fuel consumption, air pollution emissions, and road user costs. This would also create a substantial enforcement problem, and considering the overall minor reduction in noise levels, reduction of the speed limit is not a practical approach to noise abatement in this instance.

Buffer zones are undeveloped open spaces that border a highway. Buffer zones are created when a highway agency purchases land or development rights, in addition to the normal ROW, so that future dwellings that would otherwise have an excessive noise level from nearby highway traffic. Creating buffer zones would require the elimination of many of the sensitive receptors, as well as greatly increasing the ROW costs.

Noise walls were considered for noise abatement along the west side of I-55 between E.H. Crump Boulevard and McLemore Avenue for both Build Alternatives. Based on a preliminary review of this area for each alternative, a noise barrier that would be considered feasible and reasonable according to the TDOT Policy on Highway Traffic Noise Abatement could be constructed at this location. Assuming a noise barrier can be constructed for $20 per square foot, a noise barrier with an average height of 12 feet could be constructed for approximately $19,000 per benefited receptor. This would meet TDOT's cost-effectiveness criteria.

3.10.1.6 Construction Noise

Trucks and machinery used for construction produce noise and vibration, which may affect some land uses and activities during the construction period. Individuals inhabiting homes along I-55 will at some time experience perceptible construction noise and vibration from the implementation of this project. Occupants of buildings within a radius of approximately 200 feet from very specific construction equipment may perceive ground vibration effects during the operation of that equipment. Although these effects are of a temporary nature, and will vary from day to day based on specific construction operations, even minor cosmetic damage is unlikely to occur to buildings situated beyond approximately 100 feet from the heaviest vibration generators. To minimize or eliminate the effects of construction noise on adjacent sensitive receptors, mitigation measures have been incorporated into the Tennessee Department of Transportation's *Standard Specifications for Road and Bridge Construction*.

3.10.2 Potential Noise Impacts of the No-Build Alternative

3.10.2.1 Direct Impacts (Noise –No-Build Alternative)

Noise impacts for this project were evaluated in accordance with the FHWA Noise Assessment Guidelines. Table 3.15 identifies the number of sensitive receptors that would experience traffic noise impacts for existing, No-Build, and Build Alternatives. Based on the noise analysis conducted for this project, the No-Build Alternative would result in 24 impacts. Three of the receptors were not identified in Table 3.15 or depicted on Figure 3.4 because those homes would be removed under the

Build Alternatives. However, under the No-Build Alternative these three additional homes would remain in place and would continue to be impacted by high noise levels.

3.10.2.2 Indirect Impacts (Noise –No-Build Alternative)

If no improvements are made to the existing I-55 Interchange, there could be potential noise impacts for receptors along secondary roadways or other routes that may be used by commuters to bypass congestion on I-55. As traffic volumes increase and LOS of the existing interchange continue to decline, it is likely that other roadways in the area would be more heavily used than would occur if I-55 could be improved to provide better LOS. This would primarily be a problem in large trucks started using alternative routes to bypass the I-55 Interchange area by cutting through local neighborhoods or other roadways not normally traveled heavily by trucks.

3.10.2.3 Cumulative Impacts (Noise –No-Build Alternative)

There would be potential cumulative noise impacts if the I-55 Interchange were not improved. Cumulative noise impacts would primarily occur along secondary roadways and other routes that may be used by I-55 motorists trying to avoid congestion at the existing interchange. Additional traffic volumes that are likely to occur due to other unrelated, but reasonably foreseeable industrial, commercial, or residential development projects would combine with increased traffic on secondary roadways due to motorists trying to bypass the interchange. This would result in potential increases in noise levels and lower LOS on the secondary routes. If LOS declines on secondary routes, noise levels would likely increase due to additional acceleration and deceleration that would be required, especially in congested areas. Also, additional trucks moving through the alternative routes would add to the noise levels in those areas.

3.10.3 Potential Noise Impacts of Alternative A

3.10.3.1 Direct Impacts (Noise –Alternative A)

Noise impacts for this project were evaluated in accordance with the FHWA Noise Assessment Guidelines. Noise modeling results for the project are shown on Table 3.15. Under Alternative A, 39 noise impacts are projected. The additional noise impacts compared to the No-Build Alternative would be due primarily to shifting of the main traffic lanes of I-55 slightly west of the existing lanes in order to eliminate the need for the cloverleaf ramps for mainline I-55 traffic. The curvature required to allow free-flowing mainline traffic on I-55 through the interchange area would require displacement of eight existing residences and would move the roadway closer to remaining homes in the French Fort Neighborhood. All of the remaining homes in the French Fort Neighborhood are already subjected to some noise from I-55. However, movement of the roadway closer to those homes would result in higher noise levels than currently exists. Noise abatement measures, such as sound walls may be installed to help reduce noise impacts.

3.10.3.2 Indirect Impacts (Noise –Alternative A)

Indirect noise impacts associated with Alternative A could occur due to new developments that may be promoted by the improved traffic conditions on I-55. Improving LOS on I-55 may make some properties in the general project area more attractive for industrial, commercial, and/or residential developments. Such developments would likely increase traffic volumes along local access roads and on primary routes such as I-55 resulting in potential increased noise levels in some areas. It is not possible to predict the severity of such impacts at this time.

3.10.3.3 Cumulative Impacts (Noise –Alternative A)

Implementation of Alternative A would result in potential cumulative noise impacts when combined with other potential development projects expected to occur in the reasonably foreseeable project. It is probable that new industrial, commercial, and/or residential development would result in increased

traffic volumes on I-55, including truck traffic. These additional vehicles would increase noise levels in some areas, including the French Fort Neighborhood homes that would be impacted by the I-55 Interchange project. Noise abatement measures would likely help reduce the potential for cumulative noise impacts in the project area.

3.10.4 Potential Noise Impacts of Alternative B

3.10.4.1 Direct Impacts (Noise –Alternative B)

Noise impacts associated with Alternative B would be essentially the same as those discussed under Alternative A, except there would by 37 noise impacts under Alternative B (compared to 39 for Alternative A).

3.10.4.2 Indirect Impacts (Noise –Alternative B)

Indirect noise impacts associated with Alternative B would be the same as those discussed under Alternative A.

3.10.4.3 Cumulative Impacts (Noise –Alternative B)

Cumulative noise impacts associated with Alternative B would be the same as those discussed under Alternative A.

3.10.5 Mitigation

Based on preliminary evaluation, a noise barrier would be considered feasible and reasonable and could be constructed to provide noise abatement for residents in the French Fort Neighborhood. The final decision on implementation of abatement measures will be made during the project design phase and after consideration of input from the public involvement process.

Trucks and machinery used for construction produce noise and vibration, which may affect some land uses and activities during the construction period. Individuals inhabiting homes along I-55 will at some time experience perceptible construction noise and vibration from the implementation of this project. Occupants of buildings within a radius of approximately 200 feet from very specific construction equipment may perceive ground vibration effects during the operation of that equipment. Although these effects are of a temporary nature, and will vary from day to day based on specific construction operations, even minor cosmetic damage is unlikely to occur to buildings situated beyond approximately 100 feet from the heaviest vibration generators. To minimize or eliminate the effects of construction noise on adjacent sensitive receptors, mitigation measures would be implemented in accordance with TDOT's *Standard Specifications for Road and Bridge Construction*.

3.11 Water Quality

3.11.1 Affected Environment

Prior to the field surveys, USGS 7.5 minute quadrangle maps were reviewed to determine the potential existence of streams and/or other water resources within the projected ROW and 500-foot study corridor. No mapped streams were identified within the project area. To confirm this information, the entire study corridor was surveyed in the field for presence of ephemeral streams, intermittent streams, perennial streams, and wet-weather conveyances, and it was confirmed that none were present. Field surveys also concluded that there are no springs, ponds, or lakes within the projected ROW or 500-foot study corridor. No Federal Wild and Scenic Rivers or Tennessee State Scenic Rivers occur within or in the vicinity of the project area.

Because of the elevated geographic positioning of the project area relative to the immediate surrounding areas, it is likely that it never contained substantial water resources. Precipitation runoff has likely been the primary water-related influence in the area. Since European settlement, the topography and landscape within the project area has been substantially altered by extensive urban

development. This includes leveling for construction and installation of underground stormwater sewer systems. Several stormwater grates were located during field investigations, and it is likely that these now accommodate the majority of the precipitation runoff from the site. The stormwater system in the project area is monitored to ensure compliance with regulations regarding stormwater discharges. It is not anticipated that the proposed project would result in substantial changes to the existing stormwater system or the volume or quality of water transported by the system.

3.11.2 Potential Water Quality Impacts of the No-Build Alternative

3.11.2.1 Direct Impacts (Water Quality –No-Build Alternative)

Because no activities related to the proposed I-55 Interchange would occur under the No Action Alternative, there would be no direct impacts to water quality.

3.11.2.2 Indirect Impacts (Water Quality –No-Build Alternative)

Because no activities related to the proposed I-55 Interchange would occur under the No Action Alternative, there would be no indirect impacts to water quality.

3.11.2.3 Cumulative Impacts (Water Quality –No-Build Alternative)

Because no activities related to the proposed I-55 Interchange would occur under the No Action Alternative, no impacts on water quality would occur when combined with other unrelated projects in the area.

3.11.3 Potential Water Quality Impacts of Alternative A

3.11.3.1 Direct Impacts (Water Quality –Alternative A)

Because there are no aquatic resources occur in the proposed ROW or within the 500-foot study corridor, there would be no direct impacts to these resources.

3.11.3.2 Indirect Impacts (Water Quality –Alternative A)

There would be potential short-term adverse indirect impacts to water quality downstream of the site as a result of this construction. These could arise from increased soil disturbance caused by construction activities. Downstream sediment loading could increase during precipitation events. These impacts are expected to be minimal, because construction efforts would consist of improvements in a previously developed area so no major grading or cut and fill activities would be required. Best Management Practices, such as silt fencing, would be utilized to control short-term indirect impacts from sediment runoff at areas such as stormwater grates.

In the long-term, construction of the interchange and the resulting improved traffic flows could have a positive indirect impact to water quality. This positive impact would occur as congestion would be reduced allowing individual vehicles to move through the area more quickly. This would reduce the length of time that vehicles would be forced to sit idle and potentially leak fluids such as petroleum products, antifreeze, and other chemicals, some of which could wash into storm sewers in runoff from the roadway surface.

The I-55 Interchange improvements could result in an increase in secondary industrial, commercial, and/or residential developments in the general project area due to improved access and commuting times. These secondary developments could result in additional soil disturbance and sedimentation into adjacent watercourses during the construction phases of those projects, and could create more impervious surfaces that increase runoff to the stormwater system. New industries could also elevate the chance of spilling contaminated materials, resulting in potential adverse impacts to water quality. All new developments would be regulated by local, state, and federal environmental regulations to help ensure no substantial water quality issues occur.

Alternatively, if any of the secondary developments potentially spurred by the interchange improvements are built where former industrial sites occurred; it is possible that there may be slight reduction in long-term water quality impacts as those sites would likely be "cleaned-up" prior to the new developments being constructed. Removal of any contaminated soils or other potential pollutants from those sites would be beneficial.

It is anticipated that some new development would occur in the general project vicinity regardless of whether the I-55 Interchange improvements are implemented. The interchange improvements would likely increase the rate at which certain areas become developed.

3.11.3.3 Cumulative Impacts (Water Quality –Alternative A)

No substantial changes to water quality would be anticipated as a result of this project, even when combined with other past, present, and reasonably foreseeable projects. There may be minor short-term adverse impacts to water quality during the construction phase of the project due soil disturbance and potential sedimentation in downstream watercourses. If other projects are being constructed during the same period, there would be a chance that the stormwater system and downstream watercourses could be impacted at the same time. Use of BMPs during construction will decrease the risk of any substantial water quality impacts from this project. Other development projects would also be regulated by local, state, and federal environmental laws aimed at reducing environmental impacts, including water quality.

In the long-term it is anticipated that potential water quality issues in the general project would improve due to the improved interchange, which should reduce traffic congestion and reduce the length of time vehicles spend idling in the area and possibly leaking petroleum products or other chemicals. When combined with stricter regulations regarding stormwater discharges and revitalization/clean-up of former industrial sites, the general project area should have fewer potential impacts to water quality compared to baseline conditions.

3.11.4 Potential Water Quality Impacts of Alternative B

3.11.4.1 Direct Impacts (Water Quality –Alternative B)

Because no aquatic resources occur in the proposed ROW or within the 500-foot study corridor, there would be no direct impacts to these resources.

3.11.4.2 Indirect Impacts (Water Quality –Alternative B)

Indirect water quality impacts associated with Alternative B would be essentially the same as those discussed under Alternative A.

3.11.4.3 Cumulative Impacts (Water Quality –Alternative B)

Cumulative water quality impacts associated with Alternative B would be essentially the same as those discussed under Alternative A.

3.11.5 Mitigation

Although only short-term indirect adverse impacts to water quality are anticipated, all reasonable precautions will be taken to ensure that any potential adverse impacts are minimized. Water quality protection measures are described in the following documents:

- Tennessee Erosion and Sediment Control Handbook (TDEC, 2001c)
- Riparian Restoration and Streamside Erosion Control Handbook (TDEC, 1998b)
- Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites (Smoot, 1992).

- Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction (TDOT, 2006).

Examples of mitigation measures may include:

- The unnecessary removal of existing vegetation would be avoided. Canopy removal along all working or staging areas would be limited to the extent practicable.
- Where removal of vegetation is necessary, sediment control measures would be employed immediately at the start of construction.
- Control structures would be inspected and properly maintained throughout the life of the project.
- Permits - The acquisition of permits will occur prior to initiation of construction activities, pursuant to Section 69-3-108(a) of the Tennessee Water Quality Control Act of 1977 and other state and Federal laws and regulations. These permits could include:
    - CWA Section 404 Permit – required for construction that involves the placement of dredge and fill material in Waters of the U.S. Typical Waters of the U.S. include rivers, blueline streams, headwaters streams, and special aquatic sites, such as wetlands. The U.S. Army Corps of Engineers (USACE) would require section 404 Permits prior to construction.
    - Aquatic Resource Alteration Permit (ARAP) – required for any alterations of state waters, including wetlands, which do not require a federal (Section 404) permit. ARAP permits are required for construction at locations where the proposed project involves placement of fill in the following: a pond that is spring fed or impacts springs; reservoirs; wetlands; blue line streams; intermittent blueline streams on the USGS quadrangle map; any stream that supports any form of aquatic life; or is in the vicinity of a State-listed endangered species. Tennessee Department of Environment and Conservation (TDEC), Division of Water Pollution Control issues ARAP permits.
    - National Pollutant Discharge Elimination System (NPDES) Stormwater Construction Permit – required for grubbing, clearing, grading, or excavation of one or more acres of land. TDEC's Division of Water Pollution Control issues NPDES permits.
    - Tennessee Construction General Permit for Storm Water Discharges from Construction Activities (TNCGP) – required by operators of construction sites in Tennessee.

In addition, the State of Tennessee may require water quality certification under Section 401 of the CWA. Section 401 certification ensures that activities requiring a Federal permit or license will not cause pollution in violation of state water quality standards.

Specific mitigation measures for this project would be developed during the permit acquisition process once final design plans have been developed, but prior to any construction activities. All construction activities and associated mitigation requirements would need to be approved by the appropriate agencies responsible for protecting water resources in the project area. Continued coordination with appropriate regulatory agencies would occur during final planning and construction

of the project and extend through required monitoring periods that will be established during the initial permit acquisition process.

A spill prevention, control, and counter measures (SPCC) plan would be developed for both the construction process and for operations after construction. This plan would define the emergency response plan in cases where accidental releases of hazardous substances occurred, including potential spills or releases adjacent to stormwater systems.

3.12 Wetlands

3.12.1 Affected Environment

Section 404 of the CWA extends authorization to the USACE to regulate activities that affect waters of the United States, including wetlands, and to issue permits for the discharge of dredged or fill material into wetlands and other water of the U.S. Activities that impact wetlands or waters of the U.S. require Section 404 permitting and mitigation may be required.

The USACE defines wetlands as "those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR Part 328.3b). In general, to be considered jurisdictional, a wetland area must satisfy criteria for hydrology, hydric soils, and hydrophytic vegetation. Wetland hydrology means that water permanently or periodically inundates soils or that the soil is saturated to the surface for a given duration during the growing season. Hydric soils show signs of reduced rather than oxidized soil conditions. Hydrophytic plants have adapted to areas having hydric soils or to areas that have inundated or saturated soils, which create anaerobic/anoxic conditions.

Wetland areas may perform a variety of functions and provide many values for society. Functions are ecological roles that the wetland system performs within the greater landscape, such as water storage, carbon fixation, nutrient transformation, and species habitat. Values are attributed to wetlands based on their worth to humans. Examples of wetland values include flood control, hunting/recreation, timber production, and waste water treatment. Some wetlands are better at performing certain functions or providing certain values than others.

Prior to field investigations, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps and USGS topographic maps were analyzed to determine potential locations of jurisdictional wetland areas in the proposed project area. The NWI program identifies potential wetland areas through stereoscopic analysis of high altitude aerial photographs. Potential wetland areas are classified in accordance with Cowardin (1979) based on interpretation of vegetation, visible hydrology, and geography observed on the photographs. The NWI map was used as an initial screen to determine likely locations of potential wetland areas within the project area.

A thorough field survey was conducted to determine if jurisdictional wetlands occur within the boundaries of the proposed project area. It was determined that no jurisdictional wetlands occur within the proposed ROW or 500-foot study corridor.

3.12.2 Potential Wetland Impacts of the No-Build Alternative

No wetland impacts are anticipated under the No-Build Alternative.

3.12.3 Potential Wetland Impacts of Alternative A

3.12.3.1 Direct Impacts (Wetlands –Alternative A)

Because no jurisdictional wetlands occur within or near the project area, there will be no direct impacts to wetlands under Alternative A.

3.12.3.2 Indirect Impacts (Wetlands –Alternative A)

Although no jurisdictional wetlands occur within or near the immediate project area, there would be a slight potential for this project to result in indirect impacts to wetlands due to induced developments that may occur once the new interchange were completed. The new interchange may promote additional residential, commercial, and/or industrial developments in the region due to the improved access and traffic flows anticipated. It is possible that some wetland areas could be impacted as part of those secondary developments. It is not possible to quantify such impacts at this time. All new developments in the area, whether promoted by this project or unrelated to it, would be subject to all local, state, and federal regulations regarding environmental impacts, including wetlands. It is likely that impacts to wetlands would be avoided, minimized, and/or mitigated for as part of the permit phase of those projects.

3.12.3.3 Cumulative Impacts (Wetlands –Alternative A)

There are no known wetlands within the immediate project area that could be impacted by the I-55 Interchange project. However, there may be wetlands in the region that may be impacted by secondary developments that could be spurred by the interchange improvements. Any impacts to wetlands associated with those secondary or induced developments would combine with wetland impacts from past, present, and reasonably foreseeable future projects. It is not possible to determine what, if any, indirect wetland impacts would occur at this time. However, it is anticipated that wetland impacts would likely be very minimal as all new developments would be subject to compliance with local, state, and federal regulations aimed at protecting remaining wetland resources. Also, at least some of the anticipated secondary developments and/or other unrelated developments are expected to occur in previously urbanized areas as part of the revitalization efforts aimed at removing abandoned and/or rundown industrial sites and replacing them with modern developments. Most of those areas occur on uplands where wetlands were likely never present or were only of the small, isolated nature.

3.12.4 Potential Wetland Impacts of Alternative B

3.12.4.1 Direct Impacts (Wetlands –Alternative B)

Because no jurisdictional wetlands occur within or near the project area, there will be no direct impacts to wetlands under Alternative B.

3.12.4.2 Indirect Impacts (Wetlands –Alternative B)

Indirect impacts to wetlands under Alternative B would essentially be the same as those discussed under Alternative A.

3.12.4.3 Cumulative Impacts (Wetlands –Alternative B)

Cumulative impacts to wetlands under Alternative B would essentially be the same as those discussed under Alternative A.

3.12.5 Mitigation

Because no known wetland impacts would occur as a direct result of this project, it is not likely that any mitigation efforts would be necessary or required. If any wetlands were discovered during any phase of this project, and it was determined that the project would impact them, TDOT would attempt to avoid them or would obtain the appropriate permits to fill or drain the wetlands, as necessary. As part of the permit process, TDOT would work with the appropriate regulatory agencies to determine what mitigation measures may be required. Similarly, if any wetlands were impacted by secondary developments and/or other unrelated development projects they would require permits and appropriate mitigation as determined by the appropriate regulatory agencies.

3.13 Water Bodies and Wildlife Habitat

3.13.1 Affected Environment

3.13.1.1 Water Bodies

A thorough field survey was conducted to determine if any water bodies occur within the boundaries of the proposed project area. It was determined that no water bodies occur within the proposed ROW or 500-foot study corridor. It is likely that the project area was historically well-drained and has never supported substantial surface waters due to its close proximity to the Mississippi River bluff formed by the western terminating edge of the West Tennessee Plain.

3.13.1.2 Fish and Wildlife Habitat

Historically, the project area was part of the temperate-deciduous forest and fell within the Oak-Chestnut forest region of eastern North America (Braun, 1950). This forest region is composed of a limited number of co-dominant canopy species and a rich herbaceous understory. Within the project area none of the historical vegetation coverage type remains. The original biological composition of the project area has been substantially altered by long-term and intensive urban development. The vast majority of the area is being utilized for commercial, residential, transportation, and industrial activity. Very little suitable terrestrial wildlife habitat is present. The limited vegetation that persists along the river and in non-maintained areas can be classified as scrubby and low quality for most native species. No aquatic wildlife habitat is present within the 500-foot study corridor.

Nonnative flora and fauna can cause major changes to ecosystems, upset the ecological balance, and cause economic harm to agriculture and recreation sectors. In accordance with Executive Order (EO) 13112 Invasive Species, field surveys included visual observations for invasive species populations or other evidence of invasive species. Japanese honeysuckle (*Lonicera japonica*) and Chinese privet (*Ligustrum sinense*) were common within the study area. Due to the highly disturbed nature of the site, there is potential for individuals or small isolated populations of other invasive species to be present in vicinity of the project area.

There is only limited wildlife usage within the vicinity of the project area due to the dissected and urbanized condition of the landscape. It is likely that small mammals and songbirds utilize the scrubby habitat located around the edges of existing railroad tracks and in overgrown or abandoned lots. Migrating birds may utilize some of the remaining trees along the river as resting or foraging habitats as they move through the area. A few resident species such as woodpeckers and owls may inhabit the area. Some suitable habitat might be present for squirrels, raccoons, foxes, and opossums since they are often adapted to urban settings. It is possible that an occasional individual or two of species such as white-tailed deer and coyotes may use the scrubby habitats adjacent to the Mississippi River while dispersing between suitable habitats. No aquatic habitats, such as wetlands or streams, are present within the proposed ROW or 500-foot study corridor. Therefore, no aquatic species utilize the project area due to the lack of habitat.

3.13.2 Potential Impacts on Waterbodies and Wildlife from the No-Build Alternative

No impacts to waterbodies or wildlife are anticipated under the No-Build Alternative.

3.13.3 Potential Impacts on Waterbodies and Wildlife from Alternative A

3.13.3.1 Direct Impacts (Waterbodies and Wildlife –Alternative A)

Since there are no waterbodies within the project area, direct adverse impacts to aquatic habitats would not occur as a result of interchange construction under Alternative A. Since there is only a small amount of low quality wildlife habitat within the project area, negligible impacts to wildlife habitat would be anticipated. Minor, short-term direct disturbances to wildlife occurring within the

project area would occur from construction activities and noise during construction. However, any wildlife in the project area is already accustomed to vehicle noise and other human induced disturbances so little change from baseline conditions is expected.

3.13.3.2 Indirect Impacts (Waterbodies and Wildlife –Alternative A)

Minimal short-term indirect impacts to aquatic habitats could occur from increased stormwater sedimentation originating at the construction site during precipitation events due to vegetation clearing and paving. Best management practices, such as silt fencing, would be utilized to control short-term indirect impacts from sediment runoff. Construction of the interchange could have a long-term positive indirect impact on aquatic resources. Reconfiguration of the interchange would likely decrease long-term indirect impacts from road related contaminants, such as petroleum products and antifreeze, by improving traffic flows and decreasing the time individual automobiles spend within the project area.

It is possible that some waterbodies and wildlife habitats could be adversely impacted due to secondary commercial, industrial, and/or residential developments that could be promoted by the improved I-55 Interchange under Alternative A. Such developments may result in additional clearing of habitats, potential increases in erosion and sedimentation into adjacent watercourses, and additional human disturbances in areas that may be further removed from human activities at the present time. It is anticipated that at least some of the potential new development that could be promoted by this project would occur in former developed areas, such as abandoned industrial sites in Memphis. In those cases, little or no additional impacts to waterbodies or wildlife would be anticipated. Also, it is likely that some new developments would occur in the general project area regardless of the project being implemented. This project could promote some of those developments to occur sooner than would have occurred without the interchange improvements. It is not possible to determine what the exact indirect impacts to waterbodies and wildlife would be at this time, as it is not known where new developments would occur and what size of an area they would impact. Local planning and zoning regulations may influence where developments occur and what areas could be protected from developments. Permits would be required for any developments that may impact streams and wetlands.

3.13.3.3 Cumulative Impacts (Waterbodies and Wildlife –Alternative A)

Any future development promoted by the proposed I-55 Interchange project would combine with other planned or reasonably foreseeable development projects to result in impacts to waterbodies and wildlife in the general project vicinity. The combination of all new developments would likely result in additional loss or fragmentation of wildlife habitats and may increase erosion and subsequent sedimentation into adjacent watercourses. Other roadway projects in the region would also likely impact wildlife habitats and waterbodies to some degree. Due to the continued expansion of the Memphis urban area, it is likely that continued development would occur regardless of this project and that adverse cumulative impacts would continue to occur as new areas are developed. Local planning and zoning could be utilized to protect any areas that may have unique or important wildlife habitat value. In addition, such plans could also limit development in riparian areas or wetlands to help protect waterbodies and aquatic habitats.

It is expected that much of the development that may be attributed to the proposed interchange improvements would occur in previously disturbed areas and would not result in substantial new impacts to waterbodies or wildlife. Therefore the potential for this project to contribute to substantial cumulative impacts to waterbodies and wildlife is expected to be relatively low. However, it is not possible to determine the extent of the impacts at this time.

Reconfiguration of the I-55 Interchange would likely decrease long-term indirect impacts from road related contaminants entering stormwater and waterbodies downstream, such as petroleum products

and antifreeze by improving traffic flows and decreasing the time individual automobiles spend within the project area. These improvements, along with stricter stormwater discharge regulations would help to protect some aquatic species from water quality issues.

3.13.4 Potential Impacts on Waterbodies and Wildlife from Alternative B

3.13.4.1 Direct Impacts (Waterbodies and Wildlife –Alternative B)

Direct impacts to waterbodies and wildlife under Alternative B would be the same as those discussed under Alternative A.

3.13.4.2 Indirect Impacts (Waterbodies and Wildlife –Alternative B)

Indirect impacts to waterbodies and wildlife under Alternative B would be the same as those discussed under Alternative A.

3.13.4.3 Cumulative Impacts (Waterbodies and Wildlife –Alternative B)

Cumulative impacts to waterbodies and wildlife under Alternative B would be the same as those discussed under Alternative A.

3.13.5 Mitigation

Although only minor short-term indirect adverse impacts may be anticipated, all reasonable precautions will be taken to reduce negative impacts to water quality and wildlife. Water quality protection measures and mitigation are described above in Section 3.11 (Water Quality).

3.14 Floodplains

3.14.1 Affected Environment

According to EO 11988 floodplains are lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year. This EO was signed by President Jimmy Carter in 1977 to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative

3.14.1.1 Beneficial Floodplain Values

Floodplains perform a variety of important natural functions, including the storage of floodwater, moderation of peak flows, maintenance of water quality, groundwater recharge, and prevention of erosion. Floodwaters support wetland ecosystem productivity by providing moisture and depositing beneficial nutrients to the soil. For many of the same reasons, flooded areas make lands more suitable for growing crops. Floodplains also provide habitat for wildlife (especially migratory birds), recreational opportunities, timber supplies, and aesthetic benefits. Floodplain encroachment may diminish or impair the natural functions of the floodplain. The project is not located in the 100- or 500-year floodplains and is in an area of minimal local flooding.

3.14.1.2 Hydrological Impacts

Encroachment into floodplains decreases the capacity for the area to convey floodwaters, which increases the potential for flood hazards. Flooding can cause serious damage to homes, businesses and public works and can pose a threat to the safety of individuals.

Potential floodplain impacts associated with the proposed construction were determined by utilizing the National Flood Insurance Rate Maps (FIRMs) prepared by the Federal Emergency Management Agency (FEMA). According to the FIRMs for Shelby County, all of the project area has been surveyed for a determination of flood hazard areas (FEMA, 1994).

The project area will traverse an area that is listed in Zone X, which is defined as flood insurance rate zone that corresponds to areas outside the 1-percent annual chance floodplain; areas of 1-percent annual chance sheet flow flooding where average depths are less than 1 foot; areas of 1-percent annual chance stream flooding where the contributing drainage area is less than 1 square mile; or areas protected from the 1-percent annual chance flood by levees.

3.14.2 Potential Impacts to Floodplains from the No-Build Alternative

No impacts to floodplains would be anticipated under the No-Build Alternative.

3.14.3 Potential Impacts to Floodplains from Alternative A

3.14.3.1 Direct Impacts (Floodplains –Alternative A)

There are no floodplains that would be directly impacted by Alternative A.

3.14.3.2 Indirect Impacts (Floodplains –Alternative A)

There is a chance that the proposed interchange improvements could spur some secondary developments in the general project area. Some of this development could impact existing floodplain areas, especially if any new industrial development occurs in areas along the Mississippi River south of the project area. It is anticipated that most new developments that may be spurred by the interchange improvement project would occur on upland areas closer to the project site, such as the areas north and east of the project area. Those areas currently contain several abandoned industrial or commercial sites that could be revitalized. No floodplains would be impacted in those areas.

3.14.3.3 Cumulative Impacts (Floodplains –Alternative A)

Because no floodplains would be directly impacted by this project, it is anticipated that this project would not result in measurable impacts to floodplains even when combined with other past, present, and reasonably foreseeable future projects. The only way this project is anticipated to impact floodplains would be due to impacts to floodplains that would be possible due to secondary developments that may be induced by the interchange improvements. However, it is likely that most projects induced by the interchange improvements would occur on adjacent upland areas and would not impact floodplains.

Other unrelated projects in the region may impact floodplains, especially any projects that occur along the Mississippi River south of the project area. The I-55 Interchange project is not anticipated to result in substantial changes to planned or anticipated developments in those areas. Most development in the areas outside of the immediate interchange project area would likely occur regardless of the I-55 Interchange project. Local planning and zoning maps could be used to reduce the amount of development in remaining floodplains in the region, which would help to reduce the potential for floodplain impacts.

3.14.4 Potential Impacts to Floodplains from Alternative B

Impacts to floodplains anticipated under Alternative B would be essentially the same as those discussed under Alternative 2.

3.14.5 Mitigation

Mitigation is not necessary, because no floodplain impacts are anticipated. Local planning and zoning regulations could be used to protect floodplains from future development impacts.

3.15 Threatened and Endangered Species

3.15.1 Affected Environment

Certain rare species are given protection under the Endangered Species Act of 1973 (ESA), as amended. The ESA, administered by the U.S. Department of the Interior, Fish and Wildlife Service (USFWS), and U.S. Department of Commerce, National Marine Fisheries Service, provides federal protection for all species designated as *endangered* or *threatened*. An *endangered* species is "in danger of extinction throughout all or a substantial portion of its range," and a *threatened* species "is likely to become an endangered species within the foreseeable future." The "take" of species listed as *threatened* or *endangered* under the ESA is prohibited, unless the take is incidental to otherwise lawful activities. To "take" a listed species includes to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. The USFWS and TDEC, Division of Natural Heritage were contacted to obtain a list of Federally-listed threatened and endangered (T&E) species that are known to occur in Shelby County, Tennessee. As shown in Table 3.16, there are four Federally-listed T&E species listed for Shelby County.

Table 3.16. Federal Threatened and Endangered Species in Shelby County, Tennessee.

Group	Common Name	Scientific Name	Federal Status
Bird	Wood stork	*Myceteria americana*	LE
Bird	Least tern	*Sterna antillarum*	LE
Mammal	Indiana bat	*Myotis sodalis*	LE
Mussel	Turgid-blossom pearly mussel	*Epioblasma turgidula*	LE

Status key: LE-Listed Endangered
LT-Listed Threatened
Source: TDEC, 2001

Bald eagles (*Haliaeetus leucocephalus*) were previously listed as a Federally-listed threatened species. On June 28, 2007 the bald eagle was officially taken off of the Federal list of endangered and threatened species. Bald eagles will continue to be protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Both federal laws prohibit "taking" -- killing, selling, harassing, or otherwise harming eagles, their nests or eggs. No bald eagles nests or habitats occur within the 500-foot study boundary for this project.

The USFWS was contacted to determine which, if any, Federal T&E species have been documented to occur in the project area and/or have suitable habitat within the project area. According to the agency response letter received from the USFWS, included in Appendix A, there are no Federally-listed or proposed T&E species known to occur within the impact area of this project. No critical habitat, highly unique/notable habitat, or other suitable habitat, including wetlands, for the Federal T&E species listed for Shelby County was identified in the project area. According to USFWS (2002), the requirements of Section 7 of the ESA have been fulfilled.

According to TDEC, Division of Natural Heritage there are no sensitive resources within one mile of the proposed corridor. Sensitive resources tracked by the Division of Natural Heritage include Federal and state-listed and proposed T&E species, other species deemed in need of management, and ecologically significant and/or managed areas. The Division of Natural Heritage maintains a database and map filing system in which sensitive resource locations are plotted on United States Geological

Survey (USGS) 7.5-minute topographical quadrangle maps. A review of the Division of Natural Heritage files indicated that there have been no sensitive resources identified within the project area.

3.15.2 Potential Impacts to Threatened and Endangered Species from the No-Build Alternative

Because there are no known threatened or endangered species within the immediate project area and no substantial changes in the baseline conditions are anticipated under the No-Build Alternative, no impacts to threatened or endangered species would be expected.

3.15.3 Potential Impacts to Threatened and Endangered Species from Alternative A

3.15.3.1 Direct Impacts (Threatened and Endangered Species –Alternative A)

Because there are no known threatened or endangered species or suitable habitats for them within the immediate project area, no impacts to threatened or endangered species would be expected under Alternative A.

3.15.3.2 Indirect Impacts (Threatened and Endangered Species –Alternative A)

There is a slight potential that some potentially suitable threatened or endangered species habitats could be adversely impacted due to secondary commercial, industrial, and/or residential developments that could be promoted by the improved I-55 Interchange under Alternative A. Such developments may result in additional clearing of habitats, potential increases in erosion and sedimentation into adjacent watercourses, and additional human disturbances in areas that may be further removed from human activities at the present time. It is anticipated that at least some of the potential new development that could be promoted by this project would occur in former developed areas, such as abandoned industrial sites in Memphis. In those cases, no impacts to threatened and endangered species would be anticipated.

If new developments occur along the Mississippi River, especially within riparian areas, there would be some potential for impacts to threatened and endangered species, both terrestrial species such as Indiana bats, and aquatic species, such as mussels. It is unlikely that this project would promote substantial development in such areas. However, regardless of this project, there may be other unrelated development projects that occur in areas containing potentially suitable habitats for listed species. Although those developments would likely occur with or without this project, it is possible that this project could promote some of those developments to occur sooner than would have occurred without the interchange improvements. It is not possible to determine what the exact impacts to threatened and endangered species may be at this time, as it is not known where new developments would occur and what size of an area they would impact. Overall, it is not anticipated that this project would result in any measurable impacts to threatened or endangered species, because no substantial changes in baseline conditions or development trends are anticipated.

Reconfiguration of the I-55 Interchange would likely decrease long-term indirect impacts from road related contaminants entering stormwater and waterbodies downstream, such as petroleum products and antifreeze by improving traffic flows and decreasing the time individual automobiles spend within the project area. These improvements, along with stricter stormwater discharge regulations would help to protect some aquatic species from water quality issues.

3.15.3.3 Cumulative Impacts (Threatened and Endangered Species –Alternative A)

Because no known populations of threatened or endangered species or suitable habitats for them occur in the project vicinity, no substantial impacts would be anticipated. However, other reasonably foreseeable projects in the region could have some impacts to potential suitable habitats for such species. Any future development promoted by the proposed I-55 Interchange project would combine with other planned or reasonably foreseeable development projects to result in potential impacts to

any populations of threatened or endangered species or their habitats in the general project vicinity. Due to the continued expansion of the Memphis urban area, it is likely that continued development would occur regardless of this project and that adverse cumulative impacts would continue to occur as new areas are developed. Local planning and zoning could be utilized to protect any areas that may have unique or important habitat values, especially riparian areas or wetlands.

It is expected that most developments that may be attributed to the proposed interchange improvements would occur in previously disturbed areas and would therefore not result in impacts to threatened or endangered species. Therefore, the potential for this project to contribute to measurable cumulative impacts to threatened and endangered species is expected to be low. However, because the locations or sizes of potential secondary developments are not currently known, it is not possible to determine the extent of the impacts at this time.

3.15.4 Potential Impacts to Threatened and Endangered Species from Alternative B

Potential impacts to threatened and endangered species associated with Alternative B would be the same as those discussed under Alternative A.

3.15.5 Mitigation

Since there would be no measurable direct, indirect, or cumulative adverse impacts to threatened and endangered species, there would be no species-specific mitigation measures required. However, all reasonable precautions and standard best management practices will be taken to reduce potential negative impacts to water quality and the surrounding environment.

3.16 Cultural Resources

3.16.1 Affected Environment

The two primary laws that apply to transportation projects and their impacts to cultural resources are Section 106 of the National Historic Preservation Act of 1966 and Section 4(f) of the Department of Transportation Act of 1966. Cultural resources include prehistoric and historic archaeological sites and historic bridges, buildings, sites, objects, and districts. The purpose of cultural resource investigations is to consider the impact of federally funded undertakings on such features that are listed in, or may be eligible for inclusion in the National Register of Historic Places (NRHP). The criteria of adverse effect, the standard by which effects to historic properties are measured, are included in 36 CFR 800.

Two types of cultural resources need to be identified to satisfy the requirements of Section 106 of the National Historic Preservation Act of 1966: architectural/historical resources (e.g., buildings and structures) and archaeological resources (e.g., sites).

An important part of the Section 106 process is consultation with the Tennessee State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation (ACHP), federally recognized Native American tribes that may attach cultural or religious significance to properties within the project study area, and local governments. Chapter 4 of this document contains a brief summary of the coordination and consultation efforts for this project and a summary of responses received from the various parties involved. Appendix B contains copies of all coordination letters related to cultural resources issues for this project.

3.16.1.1 Architectural/Historical Resources

A historic property, as defined in regulation 36 CFR Section 800.16(I)(1), is any cultural resource included in, or eligible for inclusion in, the NRHP. A cultural resource is eligible for listing in the NRHP if it meets one or more of the four NRHP Criteria and retains sufficient integrity to convey

historic significance. The NRHP Criteria states that the quality of significance is present in cultural resources when resources:

- Are associated with events that have made a significant contribution to the broad patterns of our history; or
- Are associated with the lives of persons significant in our past; or
- Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Have yielded, or may be likely to yield information important in prehistory or history.

In addition to significance, a property must also have integrity of location, design, setting, materials, workmanship, and feeling to be eligible for inclusion in the NRHP. This means that not only must resource be old; it must also retain many of its original features and be significant under or more of the four criteria listed above.

Between 2002 and 2005 TDOT historians surveyed the I-55 Interchange at E.H. Crump Boulevard and South Riverside Boulevard area of potential effect (APE) (TDOT 2005). The APE for the Historical/Architectural Assessment included a corridor approximately 1,500 feet from the proposed interchange improvements that require additional right-of-way and subsequent transition work south on I-55 that would require additional ROW, areas within the nearby viewshed of the proposed project, and areas within the potential noise impact area (up to 500 feet from the proposed improvements).

A total of three properties were identified in the APE that are listed on the NRHP: the Memphis-Arkansas Bridge, the U.S. Marine Hospital Executive Building and Laundry-Kitchen (including the expanded boundary), and the Chickasaw Heritage Park. One additional property, the W.T. Rawleigh/United Warehouse, was also considered eligible for listing in the NRHP. The Tennessee State Historic Preservation Office (SHPO) has concurred with these findings (SHPO 2006), and determined that "… the project as currently proposed will not adversely affect these resources." A copy of the SHPO letter is included in Appendix B of this EIS.

3.16.1.2 Archaeological Resources

As part of the Section 106 consultation process TDOT consulted with the following federally recognized Native American tribes:

- Quapaw Tribe of Oklahoma
- Eastern Shawnee Tribe of Oklahoma
- United Keetowah Band of Cherokee Indians
- Muscogee (Creek) Nation
- Choctaw Nation of Oklahoma
- Chickasaw Nation
- Alabama-Quassarte Tribal Town
- Kialegee Tribal Town
- Thlopthlocco Tribal Town
- Shawnee Tribe

The Chickasaw Nation and Muscogee (Creek) Nation were the only respondents to the Section 106 Consultation efforts for this project. The former requested to be notified only in the event of an inadvertent discovery, while the latter requested to be a Consulting Party on the project. TDOT will continue to coordinate with the Muscogee (Creek) Nation as a Consulting Party.

A Phase I Cultural Resources survey was conducted for the proposed improvements at the I-55 Interchange at E.H. Crump Boulevard and South Riverside Boulevard. The APE for the Phase 1 Cultural Resources survey began at the east termination of the I-55 Mississippi River Bridge and extended southward along I-55 to McLemore, Avenue. The APE included the proposed ROW of the two Build Alternatives being considered in this EIS. This area is primarily in the southwest quadrant of the existing interchange. More details regarding the APE are included in the 2008 Phase 1 Cultural Resources Survey Report on file with TDOT.

The field surveys occurred in late 2007, and the surveys included trench excavations within portions of the APE, where background research suggested an increased probability for intact cultural deposits. Twelve trenches and one block were excavated, and 46 subsurface archaeological features were identified. A single site was assigned state site number 40SY709 that includes remnants of Fort Pickering fortifications, dating to the Civil War Period, two largely intact cisterns, brick foundation piers, and numerous post molds dating to the late nineteenth to early twentieth century residential occupation on the site (Weaver &Associates, 2008).

Site 40SY709 is in the northwest portion of the interchange project area. Current information suggests that archaeological deposits are located at depths greater than 1.3-feet below the surface. Based upon the existing data Site 40SY709 has been recommended as being potentially eligible for the National Register of Historic Places under Criterion D. The SHPO recommended that Phase II testing be completed to further define the nature of the site. Phase II testing will be conducted prior to issuance of the Final EIS for this project. See Appendix B for coordination letters from SHPO regarding cultural resources issues associated with the project. The Chickasaw Nation and Muscogee (Creek) Nation were the only respondents to the Section 106 Consultation efforts for this project. The former requested to be notified only in the event of an inadvertent discovery, while the latter requested to be a Consulting Party on the project.

3.16.2 Potential Impacts to Cultural Resources from the No-Build Alternative

There would be no direct, indirect, or cumulative impacts to historical/architectural resources under the No-Build Alternative. There would be no direct, indirect, or cumulative impacts to archaeological resources from the No-Build Alternative.

3.16.3 Potential Impacts to Cultural Resources from Alternative A

3.16.3.1 Direct Impacts (Cultural Resources –Alternative A)

There would be no direct impacts to historical/architectural resources under Alternative A of the I-55 Interchange Project.

There would be direct impacts to archaeological resources (Site 40SY709) from Alternative A during construction of the main line lanes of I-55 and for the exit ramps to West Alston Avenue, West Illinois Avenue, and E.H. Crump Boulevard. Due to the large size and linear nature of Site 40SY709, it is not possible to completely avoid this site during construction. It is recommended that Phase II testing be completed to further define the nature of the site.

3.16.3.2 Indirect Impacts (Cultural Resources –Alternative A)

There would be no indirect impacts to historical/architectural resources under Alternative A of the I-55 Interchange Project.

There would be indirect impacts to archaeological resources (Site 40SY709) from Alternative A following construction of the main line lanes of I-55 and for the exit ramps to West Alston Avenue, West Illinois Avenue, and E.H. Crump Boulevard. The indirect impacts would primarily be from the secondary developments that may occur in the vicinity of Site 40SY709 and from displaced residents that may be relocated to a parcel of vacant land south of West Illinois Avenue and east of Metal Museum Drive. It is recommended that Phase II testing be completed to further define the nature of the Site 40SY709, and the vacant land south of West Illinois Avenue and east of Metal Museum Drive will be surveyed.

3.16.3.3 Cumulative Impacts (Cultural Resources –Alternative A)

There would be no cumulative impacts to historical/architectural resources under Alternative A of the I-55 Interchange Project.

There is a potential for cumulative impacts to archaeological resources (Site 40SY709) from Alternative A following construction of the primary traffic lanes of I-55 and for the exit ramps to West Alston Avenue, West Illinois Avenue, and E.H. Crump Boulevard. The cumulative impacts would primarily be from any secondary development that occurs outside of the TDOT ROW. As currently designed only a small area of Site 40SY709 would be outside of the TDOT ROW. It is recommended that Phase II testing be completed to further define the nature of the site.

3.16.4 Potential Impacts to Cultural Resources from Alternative B

3.16.4.1 Direct Impacts (Cultural Resources –Alternative B)

There would be no direct impacts to historical/architectural resources under Alternative B of the I-55 Interchange Project.

There would be direct impacts to archaeological resources (Site 40SY709) from Alternative B during construction of the main line lanes of I-55 and for the exit ramps to E.H. Crump Boulevard. As currently positioned, Alternative B would have greater impacts to Site 40SY709, because the E.H. Crump ramp bisects the site by and through its longest axis. Due to the large size and linear nature of Site 40SY709, it is not possible to completely avoid this site during construction. It is recommended that Phase II testing be completed to further define the nature of the site.

3.16.4.2 Indirect Impacts (Cultural Resources –Alternative B)

There would be no indirect impacts to historical/architectural resources under Alternative B of the I-55 Interchange Project.

Indirect impacts to archaeological resources from Alternative B would be the same as Alternative A.

3.16.4.3 Cumulative Impacts (Cultural Resources –Alternative B)

There would be no cumulative impacts to historical/architectural resources under Alternative B of the I-55 Interchange Project.

Cumulative impacts to archaeological resources from Alternative B would be the same as Alternative A.

3.16.5 Mitigation

Since there would be no impacts to historical/architectural resources from any of the alternatives (No-Build, Alternative A, or Alternative B), mitigation for historical/architectural resources would not be necessary.

Since there would be direct and indirect impacts to Site 40SY709 from both build alternatives (Alternative A and Alternative B) and since the site has mixed features from the Civil War era and late nineteenth and early twentieth century residential occupation, it is recommended that Site

40SY709 be further evaluated with Phase 2 testing. TDOT in coordination with the SHPO commits to making the requisite investigations and mitigation necessary to avoid, minimize, or mitigate potential impacts to this site.

3.17 Hazardous/Special Waste Sites

3.17.1 Affected Environment

A Hazardous Materials, Hazardous Waste, and Special Waste Study was conducted for the I-55 Interchange project. A copy of the full Technical Report is available upon request through TDOT. The purpose of the study was to identify hazardous materials, hazardous waste, and special waste sites that may affect or be affected by construction of the proposed I-55 Interchange improvement project. The presence of these sites within or adjacent to the proposed alignments was determined by conducting an environmental database search, by reviewing aerial photographs underlain by CAD layouts, and by conducting a field survey.

3.17.1.1 Database Search

A search of federal and state environmental databases was conducted to identify potential sites of concern within a one-mile radius of the project area (EDR, 2003). A description of the databases is shown on Table 3.17.

The database search returned a total of 51 records for sites with known (mapped) locations within one mile of the I-55 Interchange project area. Some records were for sites with more than one facility. Some facilities were listed in more than one database. In addition, dozens of unmapped ("orphan") sites were identified. Orphan sites are identified by EDR (2003) as occurring in the project area vicinity, but precise locations are not known. Orphan sites usually have limited facility information available, and this is reflected in the report.

Table 3.17. Environmental Databases Searched for the I-55 Interchange Improvement Project.

Database	Environmental Information Provided
Federal ASTM Standard	
National Priorities List (NPL)	Uncontrolled or abandoned hazardous waste sites targeted for possible long-term remedial action under the Superfund Program.
Proposed NPL	Sites proposed for listing on the NPL.
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	Sites that are on the NPL or are in the screening and assessment phase for possible inclusion on the NPL.
CERCLIS No Further Remedial Action Planned (CERCLIS-NFRAP)	Historical records of sites removed from CERCLIS because after initial investigation, no contamination was found, the contamination was quickly remediated, or the contamination was not serious enough to warrant Superfund action or NPL listing.
Corrective Action Report (CORRACTS)	Identifies hazardous waste handlers with Resource Conservation and Recovery Act (RCRA) corrective action activity.

Table 3.17. Environmental Databases Searched for the I-55 Interchange Improvement Project.	
Database	Environmental Information Provided
Resource Conservation and Recovery Information System - Treatment, Storage and Disposal Facilities (RCRIS-TSD)	Sites that generate, transport, store, treat, or dispose of hazardous waste as defined by RCRA.
RCRIS Large Quantity Generator	Facilities that generate 2,200 pounds (1,000 kilograms) or more of hazardous waste or more than 2.2 pounds (1 kilogram) of acute hazardous waste per calendar month.
RCRIS Small Quantity Generator	Facilities that generate less than 2,200 pounds (1,000 kilograms) but more than 220 pounds (100 kilograms) of hazardous waste per calendar month.
Emergency Response Notification System (ERNS)	Reported accidental releases of oil and hazardous substances into the environment.
Federal ASTM Supplemental	
Superfund Consent Decrees (CONSENT)	Major legal settlements that establish responsibility and standards for cleanup at NPL sites.
Record of Decision (ROD)	Document mandate for a permanent remedy at an NPL site.
Delisted NPL	Sites deleted from the NPL where no further response is appropriate.
Facility Index System (FINDS)	All facilities regulated or tracked by the U.S. Environmental Protection Agency (EPA).
Hazardous Materials Information Reporting System (HMIRS)	Contains hazardous material spill incidents reported to U.S. Department of Transportation (DOT).
Material Licensing Tracking System (MLTS)	List of sites that possess or use radioactive materials and are subject to Nuclear Regulatory Commission (NRC) licensing requirements.
Mines Master Index File (MINES)	Identifies mines.
NPL Liens	A listing of sites where EPA has filed liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability.
RCRA Administrative Action Tracking System (RAATS)	Records based on enforcement actions issued under RCRA.
Toxic Chemical Release Inventory System (TRIS)	Reported release to the air, water, and land in reportable quantities under the Superfund Amendments and Reauthorization Act (SARA) Title III Section 313.
Toxic Substances Control Act (TSCA)	Identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substances Inventory list.

Table 3.17. Environmental Databases Searched for the I-55 Interchange Improvement Project.	
Database	Environmental Information Provided
FIFRA/TSCA Tracking System (FTTS)	Tracks administrative cases and pesticide enforcement actions and compliance activities related to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), TSCA, and Emergency Planning and Community Right-to-Know Act (EPCRA).
State ASTM Standard	
State Hazardous Waste Sites (SHWS)	Priority sites planned for cleanup. State equivalent to CERCLIS.
Solid Waste Disposal Facilities (SWF/LF)	Permitted solid waste disposal facilities/landfills that are active or inactive.
Leaking Underground Storage Tank (LUST) List	Leaking underground storage tanks in Tennessee from the Tennessee Department of Environment and Conservation.
Underground Storage Tank (UST)	Registered underground storage tank list.
State or Local ASTM Supplemental	
Aboveground Storage Tank (AST)	Registered aboveground storage tank list.
Drycleaners	A list of all active registered drycleaner facilities. Some inactive facilities may be included.
HIST_LUST CO	Leaking underground storage tanks in Tennessee from the Tennessee Department of Environment and Conservation, Columbia Field Office.
LUST_JO	Leaking underground storage tanks in an 8-county area from the Tennessee Department of Environment and Conservation, Johnson City Field Office.
EDR Proprietary Historical Databases	
Coal Gas	Former manufactured coal gas sites.
Source: EDR, 2003	

3.17.1.2 Aerial Photograph Review

Aerial photographs were reviewed to identify facilities within the study area that may warrant a site inspection. Facilities that were identified from the aerial photos were visually surveyed for their potential to handle or generate hazardous and/or special waste. Those facilities were compared to the environmental database list of sites in the area.

3.17.1.3 Field Survey

A field survey of the study area was conducted to verify the findings from the database search and aerial photographs. A one-to-one correlation with the environmental database list was performed for many of the facilities identified. The locations and names of the facilities included on the environmental database were confirmed or modified, as appropriate. The field survey was also used

to eliminate facilities from the environmental database list that were erroneously reported to be located within the study area. In addition, existing facilities not identified on the database lists were noted, if they were considered to potentially handle or generate hazardous and/or special waste.

As discussed above, EDR (2003) identified all known facilities located within one mile of the I-55 Interchange project area. Many of these facilities present extremely minor contamination risk due to the nature of the operations at the facility and its location in relation to the project area. For example, the database search yielded records for a facility that has a single, permanently closed underground storage tank (UST) and is located nearly one mile from the project area. During the field survey, only facilities that are located within 0.25 miles from the project area were investigated unless the site had hazardous conditions that may impact the I-55 Interchange project.

Some of the facilities identified in the database report, and reported to occur within the minimum search distance, could not be located during the field survey. In these instances, it is likely that the database contained outdated or inaccurate information. Possible reasons may include: the facility may no longer exist at the location; business may be performed under a different name than is listed on the database; or an administrative address may have been listed rather than a street address.

3.17.1.4 Identification and Rating of Sites

Parcels were evaluated based upon their current usage, past usage, and the location of the property relative to the proposed ROW for the I-55 Interchange project. As discussed above, the assessment consisted of an environmental database search, a review of aerial photographs, and field reconnaissance. Overall, a total of 53 separate hazardous waste, special waste, or other sites were identified that may potentially impact, or be impacted by, construction of the interchange reconfiguration. Table 3.18 summarizes all of the sites.

Table 3.18. Summary of Hazardous Waste and Special Waste Sites for the I-55 Interchange Project in Shelby County, Tennessee.

Site ID[1]	Site Name	Site Address	Site Type	Approximate Distance from Corridor
5	Barton's Texaco	694 Riverside Boulevard	UST	0.125 miles N
5	BP Service Station	694 Riverside Boulevard	LUST	0.125 miles N
5	Memphis Import Co.	648 Riverside Boulevard	UST	0.25 miles N
8	Unknown Facility	141 West Carolina Ave.	UST	0.125 miles NE
8	Tri-State Body Works	122 West Carolina Ave.	RCRIS-SQG FINDS	0.125 miles NE
9	Gulf Service Station	694 Arkansas Riverside	UST	0.125 miles N
10	Vertex Chemical Corp.	222 Channel St.	UST	0.125 miles NW
11	National Pressed Steel	28 West Virginia Ave.	RCRIS-SQG FINDS	0.125 miles E

Site ID[1]	Site Name	Site Address	Site Type	Approximate Distance from Corridor
11	National BEDG and FRN Industries		RCRIS-SQG FINDS	N/A
11	Jehl Cooperage Co.	4 E Virginia	CERCLIS RCRIS-SQG FINDS UST	0.125 miles E
14	D Canale Beverages Inc.	45 West E.H. Crump Blvd.	UST	0.125 miles E
14	Tom Ferguson	69 West E.H. Crump Blvd.	UST	N/A
15	Phillips 66	291 Alston	LUST UST	0.1 miles S
16	Economy Boat Store	398 West Illinois Ave.	RCRIS-SQG FINDS	0.125 miles S
16	American Commercial Liquid Terminal	427 West Illinois Ave.	RCRIS-SQG FINDS ERNS	0.125 miles S
17	Lanigan Storage	125 West Illinois Ave.	UST	N/A
17	Gand W. Diesel Service Co.	892 West Kansas St.	RCRIS-SQG FINDS	0.1 miles E
18	Ozark Motor Lines, Inc.	27 West Illinois Ave.	UST	N/A
19	City Iron and Metal Co..	29 East Illinois Ave.	RCRIS-SQG FINDS	N/A
20	Penske Truck Leasing Co.	922 Pennsylvania St.	RCRIS-SQG FINDS LUST UST	< 0.125 miles E
21	Former Burgie Industries	90 West Desoto St.	RCRIS-SQG FINDS ERNS	0.125 miles E
22	Hershey Foods Corp.	975 Kansas St.	RCRIS-SQG FINDS UST	0.125 miles E

Site ID[1]	Site Name	Site Address	Site Type	Approximate Distance from Corridor
23	Lion Oil Co.	1023 Riverside Boulevard	RCRIS-SQG FINDS ERNS	0.25 miles W
24	Exxon-Mobil Terminal	454 Wisconsin Ave.	RCRIS-SQG FINDS UST	0.25 miles W
25	Rich-Well Bedding Co.	1052 Kentucky St.	RCRIS-SQG FINDS	0.25 miles E
26	Silver Products MFG Co.	668 North T63	RCRIS-SQG FINDS	N/A
26	Keystone Laboratories	1103 Kansas St.	RCRIS-SQG FINDS	0.25 miles E
29	Ralph L. Jackson Inc.	1054 Kansas St.	RCRIS-SQG FINDS	0.25 miles E
30	Cooper Air Freight	1081 Arkansas St.	UST	0.1 miles E
30	Watkins Motor Lines	1046 Arkansas St.	RCRIS-SQG FINDS UST	0.1 miles E
31	Dravo Basic Materials	534 Jack Carley Causeway	UST	0.25 miles W
32	First U.S. Chemical	1145 Kansas St.	FINDS SSTS	0.25 miles E
32	Unarco Commercial Products	1132 Kansas St.	RCRIS-SQG FINDS UST	0.25 miles E
32	Elam's Machine and Supply	134 West Nebraska	RCRIS-SQG FINDS	0.25 miles E
32	Trumbo Inc.	1106 Kansas St.	RCRIS-SQG FINDS UST	0.25 miles E
34	Ryder Truck Rental Inc.	1135 Riverside Boulevard	RCRIS-SQG FINDS AST UST LUST	0.125 miles W

Site ID[1]	Site Name	Site Address	Site Type	Approximate Distance from Corridor
35	Exit 11 of Interstate 55	N/A	ERNS	0.0 miles S
36	Churchill Truck Lines Inc.	215 West McLemore	LUST UST	0.125 miles SE
37	Yellow Freight System Inc.	185 West McLemore	RCRIS-SQG UST	0.25 miles SE
37	Gordon's Transporter, Inc.	185 West McLemore	RCRIS-SQG FINDS	0.25 miles SE
40	Williams Memphis Terminals Inc.	1237 Riverside Boulevard	RCRIS-SQG FINDS	0.25 miles S
40	Texaco Sales Term 29-344	1237 Riverside Boulevard	RCRIS-SQG FINDS CERC-NFRAP	0.25 miles S
40	Union Chemical Co.	1235 Riverside Boulevard	UST	0.25 miles S
40	Unocal Chemicals	1235 Riverside Boulevard	CERCLIS RCRIS-SQG FINDS	0.25 miles S
40	Truman Arnold Co.	1235 Riverside Boulevard	UST	0.25 miles S
40	Apex Chemical Co.	1232 Riverside Boulevard	RCRIS-SQG FINDS TRIS UST ERNS	0.25 miles S
40	Daniel Taylor	1205 Riverside Blvd.	UST	N/A
45	Jefferson Smurfit Corp.	265 West Trigg	RCRIS-SQG FINDS	0.25 miles SE
45	Container Corp. of America	265 West Trigg	UST	0.25 miles SE
Orphan site	First U.S. Chemical	169 East Carolina	SSTS	N/A
Orphan site	Able Energy Co.	245 Channel Ave.	RCRIS-SQG FINDS	N/A
Orphan site	Burgie Company Chemical Fire	90 West Desoto	CERCLIS FINDS	N/A

Site ID[1]	Site Name	Site Address	Site Type	Approximate Distance from Corridor
13	Exxon R/S #5-0123	833 South 3rd St.	UST LUST	> 0.5 miles E

Site Ratings

After the completion of the database search and the visual assessment of properties within the study area, the sites were assigned hazard ratings. As shown on Table 3.19, the hazard rating system is divided into three degrees of risk: "no indication," "low," and "high." Parcels were evaluated based upon their current and past usage, and the location of the property relative to the project area. Professional judgment was used to determine the appropriate category for each site. It was assumed for the site rating that sites adjacent to the proposed highway expansion would not be categorized. Table 3.20 lists the hazard rating for each site.

Table 3.19. Hazard Rating System for Identified Hazardous Waste and Special Waste Sites for the I-55 Interchange Project.

Rating	Rationale
No Indication	• There is no indication that hazardous waste/materials or special wastes would impact highway construction after a review of all available information and a visual survey of the site from the road. • The site was identified by the database search at occurring at a specific location, however the facility could not be found during the field survey. • This does not preclude the possibility that hazardous waste/materials or special wastes could have been handled at this address at one time or at a nearby location.
Low	• Hazardous waste/materials or special wastes may have existed or may currently exist on the site, but there is limited likelihood that there would be any involvement with these wastes or materials during roadway construction. • This type of site is too distant to the corridor to impact the project.
High	• Hazardous waste/materials or special wastes were stored or handled on the site, or could currently exist at the site, and there is a possibility of soil or groundwater contamination that could impact roadway construction. • These sites have had contamination problems in the past, would pose greater risk due to the type(s) of hazardous waste/materials or special wastes, and/or are relatively close to the project area. • Sites that were found to be located within the proposed ROW (including sites not identified by the database report) that may be associated with hazardous waste/materials or special wastes were assumed to pose a high risk and given a "high" rating since they would likely be removed.

Table 3.20. Rating of Identified Hazardous Waste and Special Waste Sites for the I-55 Interchange Project.

Site Name	Site Rating
Barton's Texaco.	No indication
BP Service Station	Low

Table 3.20. Rating of Identified Hazardous Waste and Special Waste Sites for the I-55 Interchange Project.

Site Name	Site Rating
Memphis Import Co.	No indication
Unknown Facility	No indication*
Tri-State Body Works	No indication
Gulf Service Station	No indication
Vertex Chemical Corp.	No indication
National Pressed Steel	No indication
National Bedg and Frn Industries	No indication*
Jehl Cooperage Co.	Low
D Canale Beverages Inc.	No indication
Tom Ferguson	No indication*
Phillips 66	Low
Economy Boat Store	No indication
American Commercial Liquid Terminal	No indication
Lanigan Storage	No indication*
Gand W. Diesel Service Co.	Low
Ozark Motor Lines	No indication*
City Iron and Metal Co..	No indication*
Penske Truck Leasing Co.	Low
Burgie Industries	No indication
Hershey Foods Corp.	No indication
Lion Oil Co.	No indication
Exxon-Mobil Terminal	No indication
Rich-Well Bedding Co.	No indication
Silver Products Manufacturing Co.	No indication*
Keystone Laboratories	No indication
Ralph L. Jackson Inc.	No indication
Cooper Air Freight	Low
Watkins Motor Lines	No indication
Dravo Basic Materials	No indication
First U.S. Chemical	No indication
Unarco Commercial Products	No indication

Table 3.20. Rating of Identified Hazardous Waste and Special Waste Sites for the I-55 Interchange Project.

Site Name	Site Rating
Elam's Machine and Supply	No indication
Trumbo Inc.	No indication
Ryder Truck Rental Inc.	Low
Exit 11 of Interstate 55	Low
Churchill Truck Lines	Low
Yellow Freight System Inc.	Low
Gordon's Transporter, Inc.	No indication
Williams Memphis Terminals Inc.	No indication
Texaco Sales Term 29-344	Low
Union Co. of California Chemical Co.	**High**
Unocal Chemicals	**High**
Truman Arnold Co.	No indication
Apex Chemical Co.	Low
Daniel Taylor	No indication*
Jefferson Smurfit Corp.	No indication
Container Corp. of America	No indication
First U.S. Chemical	No indication
Able Energy Corp.	No indication
Burgie Co. Chemical Fire	No indication
Exxon R/S #5-0123	Low

3.17.1.5 Summary of Hazardous/Special Waste Sites in the I-55 Interchange Project Vicinity

The presence of hazardous and/or special waste with the proposed project vicinity was determined by reviewing federal and state environmental records, by reviewing aerial photographs, and by conducting a field survey. Each site was assigned a risk level of either "no indication," "low," or "high." Table 3.21 is a compilation of the risk ratings.

Table 3.21. Summary of Site Ratings: Likelihood of Hazardous Waste Impacts for the I-55 Interchange Project.

Risk Rating	Number of Sites
No Indication	38
Low	13
High	2
TOTAL	53

Two of the 53 identified sites (4 percent) were assigned a "high" risk rating. In this case both of the sites are listed at the same address. Generally, the sites given a "high" risk rating are located within the proposed ROW or immediately adjacent to the project area, may be associated with hazardous waste/material or special waste, and would likely need to be removed during highway construction.

Overall, most of the existing sites or abandoned facilities are found in the EDR report, because the site contains USTs. Only six of the sites are known to have LUSTs. Many of the identified sites are either current or former gasoline stations. These sites are not technically classified as hazardous waste sites but are potential sources of petroleum products or special wastes. These special waste sites are regulated under different regulations and requirements for monitoring and cleanup than for hazardous materials and waste.

3.17.2 Potential Impacts to Hazardous/Special Waste Sites from the No-Build Alternative

3.17.2.1 Direct Impacts (Hazardous/Special Waste Sites –No-Build Alternative)

Because no activities related to the proposed I-55 Interchange Project would occur under the No-Build Alternative, there would be no direct impacts to existing hazardous/special waste sites in the project vicinity. However, not improving the existing interchange may result in an increased potential for accidental spills of hazardous or special wastes in the area due to continued reduction in LOS on I-55 and adjacent roadways. Continued, or worsening, traffic congestion problems could result in increased crash rates in the project area. It is possible that some of those crashes could involve vehicles transporting hazardous or special wastes through the area. According to the 2005-2007 crash data, a total of 18 crashes within the immediate interchange study area involved vehicles containing hazardous cargo. Also, fuels and other liquids from vehicles damaged during a crash could leak onto the highway and be washed into stormwater sewers resulting in potential impacts to water quality where those sewers discharge. The Tennessee Emergency Management Agency (TEMA) has the responsibility and authority for coordination of all state and local agencies during accidents involving hazardous materials. The TEMA has demonstrated its ability to effectively manage such incidents.

3.17.2.2 Indirect Impacts (Hazardous/Special Waste Sites –No-Build Alternative)

If the existing I-55 Interchange is not improved, it is likely that traffic conditions would continue to deteriorate on I-55 and the adjacent roadways including E.H. Crump Boulevard and South Riverside Boulevard. As traffic conditions and LOS decline, drivers, including drivers of large trucks, may choose to use alternative routes. This may increase the risk of crashes along those alternative routes. This would likely increase the risk of accidental spills of fuel, antifreeze, and engine oil in additional areas outside the immediate project area due to crashes. These contaminants could flow into stormwater sewers and eventually discharge into downstream watercourses or wetlands. In some cases, these contaminants may not reach downstream watercourses until enough precipitation occurs to transport the materials through the stormwater pipes.

There would be additional concerns that the poor LOS anticipated at the interchange under the No-Build Alternative would result in increased congestion that would force vehicles to remain in the project area for longer periods. The longer individual vehicles remain in the area, the more chance there would be for potential hazardous and/or special wastes issues due to leaks from vehicles containing them, including leaks of fuels, oils, and other liquids used for vehicle operation. Over time, leakage from individual vehicles cold accumulate on the roadway surface and then be washed into stormwater sewers and eventually be carried into downstream watercourses.

3.17.2.3 Cumulative Impacts (Hazardous/Special Waste Sites –No-Build Alternative)

Because no construction activities would occur under the No-Build Alternative, there would be a low potential for this project to result in cumulative impacts to hazardous or special waste sites. However, the No-Build Alternative could result in long-term adverse cumulative impacts due to increased potential for accidental spills or leaks of hazardous or special waste materials on local highways. The LOS on I-55 and other adjacent roadways would continue to decline due to the interchange improvements not being completed in combination with continued urban growth in the region that is expected to continue to increase traffic volumes. The poor LOS expected on I-55 within the project area would likely result in increased crash rates, which would in turn increase the risk of accidental spills or leaks of contaminants. Also, additional traffic volumes and decreased LOS may force vehicles to move more slowly through a given stretch of roadway resulting in potential for accumulation of vehicle contaminants from vehicle leakage. All spills or leaks of any hazardous materials or special wastes could potentially result in adverse impacts to the local environment. In addition, if an accidental release of a hazardous material were to occur on the roadway, it could pose health and safety risks to nearby residents, especially those living near the roadways that could be exposed to toxic fumes or the materials themselves.

Although it is expected that at least some of the existing hazardous or special wastes sites located in the general project vicinity would be "cleaned-up" as part of the anticipated revitalization efforts, it is likely that not constructing the I-55 Interchange would slow the rate at which that revitalization occurred. With no improvement to the existing traffic issues in the area due to the existing interchange configuration, the area would remain less attractive to potential developers and/or tenants. Therefore, it is more likely that some of the idle sites containing hazardous or special wastes may remain idle for longer periods and increase the risk for potential leaks or exposure in the long term.

Conversely, leaving the existing sites idle could reduce the chance of hazardous or special waste sites being disturbed. In some cases, not disturbing previously contaminated sites may be safer, especially if proper techniques are not used to deal with or dispose of contaminated soils, equipment, or tanks. It is likely that any construction projects in the former industrial areas would be monitored closely by the EPA, state, and/or local agencies to ensure that any contaminants are properly removed from the site or otherwise contained appropriately.

3.17.3 Potential Impacts to Hazardous/Special Waste Sites from Alternative A

3.17.3.1 Direct Impacts (Hazardous/Special Waste Sites –Alternative A)

No long-term adverse impacts to hazardous/special waste from construction activities are anticipated under Alternative A. Only the sites located at 1235 Riverside Boulevard (Unocal Chemicals) were identified as being a potential high risk to the I-55 Interchange project during the Hazardous Materials, Hazardous Waste, and Special Waste Study. Although, this area is near the project area, the groundwater flow is expected to be towards the west in that area. Therefore, any potential contaminants from those sites would likely not be within the I-55 project boundaries. Soil contamination is not expected to be an issue due to the distance between the interchange construction zone and the location of the site. If any new hazardous or special waste sites or potentially

contaminated soils are discovered during demolition of existing buildings or during construction, they will be dealt with in an appropriate manner to ensure contaminants are removed and disposed of properly.

There is a potential for minor, short-term adverse impacts during construction due to leaks or spills of contaminants from construction equipment. No construction activities would be conducted in any watercourses or wetlands. Therefore, there is limited chance of introducing contaminants into waters. Use of BMPs and proper maintenance and cleaning of construction equipment and vehicles will reduce the potential for adverse impacts.

Improvements to the I-55 Interchange would help to reduce traffic congestion in the area allowing vehicles to move through the area more efficiently and potentially reduce crash rates. These factors would reduce the chance for accidental spills and leaks of hazardous materials or special waste in the project area. Less congestion would also reduce the amount of time vehicles leaking fluids would spend at any one location along the roadway, thus reducing the chance for heavy accumulations of hazardous fluids from leaking vehicles.

3.17.3.2 Indirect Impacts (Hazardous/Special Waste Sites –Alternative A)

Increased highway accessibility and efficiency could result in greater volumes of hazardous materials being transported through the project area. However, more efficient, faster traffic movement through the area would reduce the time that hazardous materials are on the local highways and roads. Spills on highways can cause water quality degradation and can be a possible public health hazard. The TEMA has the responsibility and authority for coordination of all state and local agencies during accidents involving hazardous materials. The TEMA has demonstrated its ability to effectively manage such incidents.

Improving traffic issues along the I-55 corridor under Alternative A would potentially remove some traffic from other local roadways that are currently used to bypass traffic congestion, or that would become more heavily used in the future for that purpose if the interchange were not improved. This would help reduce the risk of accidental spills or leaks of hazardous materials along other roadways in the area, some of which may be local neighborhood streets or other roadways with more residences along them.

There is potential that the interchange improvements could promote secondary development in the general project vicinity due to better traffic flow and accessibility. Some of this new development is expected to occur in the abandoned industrial sites in the areas north and east of the project, some of which are thought to contain potential hazardous or special waste sites. In general, revitalization of those areas would have long-term beneficial impacts due to removal and “clean-up” of potentially harmful materials from those sites. The sooner the materials, tanks, and old equipment are removed from those locations the less chance they would have to result in leaks or spread of contaminants from those sites.

Alternatively, it is possible that disturbance of some of the potentially contaminated sites could result in the spread or transport of those materials to other sites. The EPA and state and local agencies would monitor revitalization efforts in former industrial sites to ensure that all potentially harmful materials are dealt with appropriately and thoroughly. In most cases, “clean-up” would simply involve removal of old USTs or ASTs or old equipment containing greases, oils, or other potential contaminants. However, at sites where known LUSTs are located, or were located in the past, the “clean-up” efforts would be more involved and may include excavation and removal of existing soils where contaminants may have leaked.

It is possible that the interchange improvements could promote development of gas stations in the area as part of the secondary developments that could occur. Gas stations would bring with them the

risk of contamination due to fuel stored in USTs and due to potential spills on the surface. However, the risks associated with modern gas stations containing new USTs are lower than in the past due to more stringent requirements for storing and handling fuels and other potentially harmful substances. Therefore, even if new gas stations were developed in the project vicinity, it is not likely that overall risks would increase substantially.

3.17.3.3 Cumulative Impacts (Hazardous/Special Waste Sites –Alternative A)

There are not expected to be any substantial adverse impacts due to hazardous/special waste sites associated with Alternative A, even when combining the potential impacts of the interchange improvements with impacts from other past, present, and reasonably foreseeable projects. In general cumulative impacts to hazardous and special waste sites would be beneficial in the project vicinity due to revitalization and "clean-up" of former industrial sites, some of which still contain potentially harmful materials. It is likely that new developments, both those promoted by the I-55 Interchange project and those that are unrelated to the project, would be constructed on at least some of the former industrial sites. The I-55 improvements may promote some of those sites to be developed sooner due to improved traffic flow and access to some sites. However, this would likely result in more potential beneficial impacts than adverse impacts. Some adverse impacts may occur due to disturbance or transport of contaminated soils; however, it is likely that developments on contaminated sites would be closely monitored by appropriate regulatory agencies to ensure all contaminated materials are dealt with appropriately.

More stringent environmental regulations placed on new developments, including new USTs installed at new gas stations, would also help to reduce potential adverse impacts from hazardous materials in the project vicinity. Therefore, even though continued development is expected, no substantial increases in risks associated with hazardous materials are anticipated.

Continued urban growth in the region would generate additional traffic volumes on local roadways, including I-55. This long-term increase in traffic volumes would eventually lead to declines in LOS on some roadways and increased crash rates. Those factors may contribute to more potential for accidental spills or leaks of hazardous materials on those roadways. At least in the reasonably foreseeable future through the design year of this project (2032), the I-55 Interchange would be expected to handle the forecasted increases in traffic in the region. Even in 2032, LOS would be expected to be better than the existing LOS at the I-55 Interchange (currently LOS F). Therefore, in the long-term, Alternative A would result in improvements to traffic flow and therefore crash rates and associated spill potential.

3.17.4 Potential Impacts to Hazardous/Special Waste Sites from Alternative B

Impacts to or from hazardous materials, hazardous waste, and special waste sites associated with Alternative B would be essentially the same as those discussed under Alternative A.

3.17.5 Mitigation

Any hazardous wastes encountered within the proposed ROW would be remediated in accordance with the applicable sections of the Federal Resource Conservation and Recovery Act (RCRA), the Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Tennessee Hazardous Waste Management Act of 1983. All project-related activity that involves USTs would adhere to the Tennessee Petroleum Underground Storage Tank Act of 1998 (Tennessee Code Annotated, section 68-215-101 *et seq*.) and the rules set forth by TDEC's Underground Storage Tank Program (Tennessee Code Annotated, section 68-215-201 *et seq*.).

3.18 Visual Quality

3.18.1 Affected Environment

The general setting of the I-55 Interchange project area consists primarily of an urban setting with mixed views throughout the length of the project. Most areas within the southwest quadrant of the I-55 Interchange are considered visually appealing due to the presence of the well-kept French Fort neighborhood, parks, National Ornamental Metal Museum, and other features. The abandoned hotel and associated property located just southwest of the existing interchange has become rundown and has reduced visual appeal. Several large trees are present in the southwest quadrant, which help the visual quality in that area. Areas in the northwest quadrant of the project area contain a mixture of developed areas including commercial properties and railroad tracks as well as a park. Some of the structures are new or revitalized and some are older and more rundown. Some trees and shrubs are located in the northwest quadrant to help screen some of the rundown sites and railroad tracks. The northeast and southeast quadrants are dominated by industrial sites including older brick, concrete, and or metal buildings, many of which are abandoned. Several industrial or commercial sites occur east of the existing I-55 and are better maintained than the abandoned properties in the area. Many of the abandoned properties contain buildings with broken, missing, or boarded windows and doors, rusted tin roofs and siding, graffiti, non-maintained lawns and landscaping, and numerous piles of junk or abandoned materials or equipment. Many of these areas present negative visual qualities.

In terms of direct views for travelers on I-55 in the project area, the best existing view may be for travelers heading north on I-55 toward the existing interchange. Travelers heading north from the southern portions of the project area can see a backdrop that includes portions of the downtown Memphis skyline. Also, after passing through the interchange and continuing west (on northbound I-55) the same travelers can see the existing bridges over the Mississippi River and trees lining the river bank. Travelers heading south on I-55 from the existing interchange can see various sights, some that are of maintained ROW areas along the roadway, and others of more rundown abandoned properties and associated visually unappealing areas.

The views within the immediate I-55 Interchange ROW itself consist of roadways, bridges, ramps, and some scattered trees in the sparsely landscaped ROW. In general, the existing interchange is somewhat lacking visual appeal due to the older, less maintained structures and older design of the roadway features. The area lacks modern or updated infrastructure and landscaping that is often perceived to be more visually appealing, especially in urban settings.

3.18.2 Potential Impacts on Visual Quality from the No-Build Alternative

3.18.2.1 Direct Impacts (Visual Quality –No-Build Alternative)

Not improving or reconfiguring the existing I-55 Interchange and associated ROW would result in potential long-term declines in visual quality in the immediate project area. Although general maintenance activities would continue to occur to maintain the function of the roadway, as time goes on, it is likely that the roadway structures and other features, such as guardrails, fencing, landscaping, and other visible aspects of the existing interchange would continue to deteriorate in visual quality. Because the existing I-55 Interchange ROW has already become somewhat visually unappealing due to the aging roadway and structures, including landscaping in the ROW, the overall impacts to visual quality from the No-Build Alternative would be minor.

For residents in the French Fort neighborhood, the visual impacts associated with the No-Build Alternative would be relatively unchanged because the existing trees separating their homes from I-55 would remain intact and help screen views of the highway.

3.18.2.2 Indirect Impacts (Visual Quality –No-Build Alternative)

If the I-55 Interchange is not reconfigured or improved, it is likely that revitalization or redevelopment of other adjacent properties may be slower to occur. This would result in potential long-term adverse impacts, because the existing run-down abandoned buildings and associated properties would remain in place and likely continue to deteriorate. This would take away from more visually appealing areas like the French Fort neighborhood and areas surrounding the Metal Museum in the southwest quadrant of the interchange.

3.18.2.3 Cumulative Impacts (Visual Quality –No-Build Alternative)

Not implementing the I-55 Interchange improvements could have long-term cumulative adverse impacts to the visual quality of the general project area primarily due to continued deterioration of existing roadway infrastructure and landscaping within the existing ROW and the abandoned buildings in the vicinity. Although some redevelopment and revitalization would likely occur in the area regardless of the interchange improvements, the continued traffic issues caused by the current interchange configuration would not promote the amount of redevelopment otherwise anticipated. Any of the abandoned properties that were not revitalized would continue to deteriorate visually.

3.18.3 Potential Impacts on Visual Resources from Alternative A

3.18.3.1 Direct Impacts (Visual Quality –Alternative A)

Alternative A would have adverse impacts on the visual quality of the project area. The visual impacts would be most noticeable for residents of the French Fort neighborhood whose view of the existing I-55 Interchange is presently blocked by other existing homes and large trees located to their north and/or east. Because some homes and trees located at the northeast corner of the neighborhood would be removed to make room for the new interchange, several of the remaining homes would be exposed to I-55 and the interchange area. Their exposure to the interchange would be increased due to the proposed through lanes for I-55 being shifted closer to the neighborhood, and because the I-55 lanes would be elevated to accommodate the underpass for the proposed connection between Illinois Avenue and Crump Boulevard.

Most of the adverse visual impact associated with the project will occur during the construction phase of the project. These short-term adverse impacts would be due to the presence of heavy equipment, construction materials, and non-vegetated areas that would be visible. Proper construction techniques would be utilized to help reduce short-term visual impacts and long-term lingering effects of construction. However, as discussed above, even after construction is complete, several homes located along the northeastern edge of the French Fort neighborhood will continue to be exposed to views of the new interchange and associated infrastructure. TDOT will continue to coordinate with residents to determine potential ways to help reduce those impacts, such as planting vegetation screens or providing aesthetically pleasing features as part of the highway design.

Although some residents of French Fort will experience unavoidable adverse visual impacts, it is anticipated that reconfiguration of the I-55 Interchange under Alternative A would be perceived by some people, including frequent users of I-55 and developers wanting to revitalize the area, as a visual enhancement due to the long-term benefits to the visual quality of the I-55 Interchange ROW itself. Once the project is completed and all the construction areas are cleaned and revegetated, it is likely that the interchange itself would be perceived as visually improved compared to baseline conditions. New signs, fencing, guardrails, landscaping, and other features would help to improve the overall look of the interchange. TDOT will continue to work with residents, local officials, and other stakeholders through the design phase of the project to help develop an interchange that fits into the context of the community while providing the needed transportation improvements.

3.18.3.2 Indirect Impacts (Visual Quality –Alternative A)

The anticipated visual improvements and basic revitalization of the I-55 Interchange and ROW, along with improved traffic conditions, would likely promote some new development and revitalization of other properties in the surrounding area. It is likely that some of this development would occur on existing abandoned properties containing run-down structures and poorly-maintained properties. Replacing those structures with modern buildings and improved landscaping would result in long-term beneficial impacts to visual quality in the project vicinity. Conversely, some secondary developments promoted by the interchange improvements may be constructed on previously undeveloped sites resulting in additional loss of open space, forests, or other more visually appealing locations. In those cases, the long-term visual impacts would likely be considered adverse. However, depending on the type of development and the surrounding setting, it may be perceived as positive by other individuals.

As discussed in previous sections of this EIS, it is anticipated that some of the displaced residences would be relocated on vacant open land just west of the existing French Fort neighborhood. This would result in short-term adverse impacts during construction of the new homes. Long-term visual impacts of the new homes may be perceived as adverse or beneficial depending on individual preferences. Placement of new homes and landscaping could improve visual quality and possibly increase values of adjacent properties. However, the homes would be placed on lands that are currently vacant open space that is perceived as visually pleasing to many residents in the area. The adverse visual impacts would likely affect the adjacent residents that can currently see the open space from their homes. However, it may also affect local residents who pass through the area or use the vacant land for recreational purposes. The open space associated with other areas, including Chickasaw Heritage Park and E.H. Crump Park would not be impacted by this project.

3.18.3.3 Cumulative Impacts (Visual Quality –Alternative A)

Alternative A would be anticipated to have an overall positive affect on visual quality in the general project area due to improvements to infrastructure and the roadway ROW within the project limits. These potential benefits to the visual quality of the area would combine with visual benefits expected from other development projects and revitalization projects in the area that are constructed in previously disturbed or abandoned sites. There would be short-term adverse impacts during the construction period of each of the projects, but once the construction is completed the long-term impacts would be beneficial.

Some of the anticipated roadway, residential, commercial, or industrial developments that would occur in the reasonably foreseeable future may combine with this project to result in additional loss of open space or currently undeveloped lands in the general vicinity of the project. This may result in some adverse impacts to visual quality in the localized areas surrounding the new developments or project sites.

In general, it is anticipated that any secondary development associated with the I-55 Interchange project would occur in previously disturbed urban areas where abandoned buildings and run-down properties exist. If those sites are redeveloped and revitalized, there would be long-term beneficial impacts, especially when combined with other revitalization efforts in the area that are unrelated to the new interchange. Some negative visual impacts may occur for some of the individual residents of the French Fort Neighborhood. However, it is likely that the revitalization efforts in portions of the areas surrounding the project would likely be perceived as beneficial to the local residents as a whole.

3.18.4 Potential Impacts on Visual Resources from Alternative B

Impacts to visual quality under Alternative B would be approximately the same as those discussed under Alternative A.

3.18.5 Mitigation

Short-term visual impacts are expected with any construction project due to construction equipment, grading, and storage of materials on site. Most visual impacts due to construction typically end once a project is complete. However, careless construction techniques can have long-term aesthetic consequences. Examples of careless construction techniques include inappropriately located disposal sites, unnecessary damage to trees that are supposed to remain on the site, and poorly located access and haul roads that cause unnecessary removal of vegetation or other impacts. Also, not properly grading, revegetating, or landscaping construction sites can result in visual impacts. If proper vegetation, such as grass or other groundcover, is not established on disturbed areas following construction, the area would likely be perceived negatively by most individuals. Non-vegetated areas also tend to have erosion issues, which usually lead to further visible issues. All of these types of construction impacts can remain visible for long periods following construction.

One of the goals of most modern construction projects, including TDOT roadway projects, is typically to provide structures or facilities that fit into the surrounding setting as well as possible so the visual affect is an improvement over existing conditions. If not perceived as an improvement, the goal would be to maintain the general visual quality in an area to the extent practical.

Mitigation measures, as defined by the CEQ (40 CFR 1508.20), include avoiding impacts, minimizing impacts, rectifying impacts, reducing or eliminating the impact over time, and compensating for the impact. Potential mitigation measures for visual impacts should include, but not be limited to:

- Consideration of post-project aesthetic appeal during the project's functional design, surveying and clearing.
- Preparation of areas within the ROW to permit successful revegetation programs that accommodate, preserve and capitalize on mature and semi-mature stands of vegetation. Care should be taken to establish native vegetation. This may be accomplished either naturally or through planned seeding.

TDOT will continue to work closely with the City of Memphis and local residents to obtain and develop ideas for designing and constructing a new I-55 Interchange that fits the context of the area and with any future plans for the area.

3.19 Energy

3.19.1 Affected Environment

The current commitment of energy resources (mainly gasoline and diesel fuels) in the project area is influenced by traffic flow patterns. When traffic flow is congested, which often occurs on the existing I-55 Interchange in Memphis, higher consumption of fuel is required than when traffic flow is flowing more freely.

Construction equipment used for roadway projects requires the use of additional energy. However, the short-term uses of extra energy during construction are typically offset by the energy resources saved due to improved traffic flows in the long-term.

There are no energy sources in the I-55 Interchange project area that would be potentially impacted. If electrical lines and gas pipelines are impacted in the project construction zone, they would be relocated as part of the project.

3.19.2 Potential Impacts on Energy from the No-Build Alternative

3.19.2.1 Direct Impacts (Energy –No-Build Alternative)

Not improving or reconfiguring the existing I-55 Interchange would result in potential long-term adverse impacts to energy resources. Traffic congestion would continue to worsen at the existing interchange and would likely eventually cause additional roadways to have reduced LOS as people looked for alternative routes to avoid the I-55 Interchange area. The poor traffic flow would continue to result in extra commitment of energy resources (diesel fuel and gasoline) than would be needed if traffic flowed more freely and efficiently.

3.19.2.2 Indirect Impacts (Energy –No-Build Alternative)

Not improving the I-55 Interchange would likely result in more congestion on other roadways in the region as people attempt to use other routes to avoid congestion. This would likely result in reduced LOS on those alternative routes and would cause increases in VMT and travel times. All of those factors would result in increased fuel consumption in the region which would cause adverse impacts to energy resources. This extra fuel would also have secondary economic impacts for local residents and businesses due to the extra fuel that would need to be purchased for commuting to and from work or for shipping items in and out of the area.

The No-Build Alternative would not promote new development in the general project area, because the traffic congestion problems would dissuade developers and potential tenants from locating in the area. This may have some potential benefits in terms of energy, because less construction would occur and less long-term energy consumption would be needed if fewer developments occurred. However, it is likely that those developments would just shift to other portions of the Memphis area or other cities putting additional energy demands on those areas. Also, if the vacant areas near the project area are not utilized/revitalized to their full potential because of traffic issues, it may result in additional energy impacts. This is because those developments, including residential, commercial, and/or industrial developments, would likely be located farther away from the downtown Memphis area and may result in longer commutes requiring additional fuel consumption. If the areas closer to downtown can be utilized less fuel would be required, especially for residents and businesses that require travel into the downtown Memphis area on a daily or regular basis.

3.19.2.3 Cumulative Impacts (Energy –No-Build Alternative)

Reduced LOS and increased congestion at the I-55 Interchange under the No-Build Alternative would have adverse impacts to energy resources, primarily fuel. When viewed cumulatively with other past, present, and reasonably foreseeable projects and trends, the impacts to energy would be even more adverse. It is anticipated that traffic volumes will continue to increase in the region due to continued urban development and economic growth in the area. Extra vehicles generated by new developments would result in worsening traffic congestion at the I-55 Interchange and other local roadways, if no improvements were made. This would result in unnecessary increases in fuel consumption.

A minor amount of relief to the potential extra fuel consumption may result from more efficient vehicles due to more stringent regulations by the government promoting auto makers to produce more fuel efficient vehicles. However, the benefits of those efforts would not be as noticeable if traffic flow issues remain due to the poor LOS on the I-55 Interchange. Anticipated improvements and addition of other roadways in the region may also help alleviate some of the traffic problems in the region as a whole. However, because I-55 is a major route and handles a substantial amount of through traffic, especially trucks, not improving the interchange would have noticeable adverse impacts due to increased energy consumption.

Revitalization efforts anticipated for portions of Memphis near the I-55 Interchange project area may be slowed or halted if the interchange improvements were not made. Not taking full advantage of

available developable sites closer in to the center of the City would cause additional impacts to energy resources. If the developable sites were not utilized, it is likely that more people would be forced to have longer commutes or travel distances and, therefore, utilize more fuel.

3.19.3 Potential Impacts on Energy from Alternative A

3.19.3.1 Direct Impacts (Energy –Alternative A)

The improved traffic flow and reduction in commuting times would decrease the amount of fuel consumption in the region. The improved LOS would allow both local commuters and through traffic to move through the area more efficiently and without having to find alternative routes to avoid congestion at the I-55 Interchange.

Short-term adverse impacts would occur due to extra fuel consumption during construction of the project. However, those short-term impacts would be more than offset by the long-term benefits of the new interchange in terms of providing more efficient travel through the area.

There could be temporary disruption of electric and gas service in the area while powerlines and/or gas pipelines are relocated (if necessary). These impacts would be short-term and would likely not cause noticeable impacts.

3.19.3.2 Indirect Impacts (Energy –Alternative A)

The improved I-55 Interchange would likely help to improve LOS on other local roadways making them more efficient. This improved LOS would be due to removing some of the traffic from those other roadways that drivers currently use to avoid congestion at the I-55 Interchange. Providing better access to the areas surrounding the project area would promote more development in the area. In terms of energy, this would likely be beneficial in the long-term, because it would take advantage of developable land close to the Downtown Memphis area. This in turn would provide for shorter commuting distances or shipping distances for residents, businesses, or industries choosing to locate in the area. The benefits of providing better access and more efficient travel to areas located adjacent to the project would result in overall positive impacts to energy.

Secondary developments promoted by the interchange improvements may put more demands on some sources of energy like electric and natural gas. However, it is likely that if the area around the I-55 Interchange were not developed, the developments would take place in other parts of the region putting the same demands on energy in those areas.

3.19.3.3 Cumulative Impacts (Energy –Alternative A)

The I-55 Interchange improvements would provide for more efficient travel through the area resulting in increased fuel efficiency and beneficial impacts to energy. Those benefits would combine with benefits of other past, present, and reasonable foreseeable transportation improvement projects in the Memphis area. Also, continued improvements by automakers in providing more fuel-efficient vehicles would also add to the overall positive impacts to energy.

Revitalization efforts near the project area would also ultimately help to reduce commuting distances and travel times for many residents and businesses that choose to locate there instead of areas located further from downtown. This would also help offset some of the increased energy demands expected throughout the Memphis region due to continued urban development and economic growth. Continued growth in the Memphis area would occur with or without the I-55 Interchange project. Therefore, this project would not necessarily add to any increased energy demands. Instead, it would help to compensate for some of the increased demands by providing for more efficient travel through the area.

3.19.4 Potential Impacts on Energy from Alternative B

Impacts to energy resources associated with Alternative B would essentially be the same as those discussed under Alternative A.

3.19.5 Mitigation

Construction of the I-55 Interchange improvements would be conducted in an efficient manner to avoid unnecessary consumption of energy. Construction equipment will be maintained regularly to allow for efficient operation and fuel efficiency.

The I-55 Interchange project has been developed to improve traffic flow conditions in the Memphis region. Meeting that goal would result in improved fuel efficiency for some vehicles traveling in the area.

3.20 Construction Impacts

Adverse impacts from construction would be primarily short-term in duration. Construction inconveniences such as noise, dust, and traffic conflicts are likely to be unavoidable yet are greatest during the construction phase only.

In order to minimize potential detrimental effects from noise, siltation, soil erosion, or possible pollution of area watercourses, the construction contractors would be required to comply with the special provisions of Standard Specifications for Road and Bridge Construction (TDOT, 2006) and the Best Management Practices for Erosion and Sediment Control (FHWA, 1995). These provisions implement the requirements of the Federal Highway Administration's Federal-Aid Policy Guide (Subchapter G part 650b).

Contractors would be required to conduct and schedule operations according to these provisions. For example, the contractor would be bound by Section 107.01 of the Standard Specifications to observe any noise ordinance in effect within the project limits. Detoured traffic would be routed during construction in a manner that has the least noise impact practicable upon residential and noise sensitive areas. In addition, coordination with affected utility companies would minimize disruption to utility services. Furthermore, TDOT would coordinate with local governments during the construction phase to minimize disruption to communities accepting detoured traffic.

Any action involving open burning would be in accordance with Chapter 1200-3-4 ("Open Burning") of the Tennessee Air Pollution Control Regulations. Any action resulting in fugitive dust would be in accordance with Chapter 1200-3-8 ("Fugitive Dust"). The general contractor and all related subcontractors associated with the project would be required to have a valid operation permit from the Tennessee Air Pollution Control Division or to obtain an exception from the regulations through board action.

Solid waste generated by construction activities would be disposed of in accordance with all state rules and regulations concerning solid waste management. Where possible, land debris would be disposed at a registered sanitary landfill site. If the use of a landfill is not possible, the contractor would dispose of the solid waste in a manner that is compliant with NEPA regulations.

Proper sediment control measures, such as silt fences, would be used as outlined in the Tennessee Erosion and Sediment Control Handbook (TDEC, 2001b) and Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites (Smoot et al., 1992).

3.21 Required Permits

The acquisition of permits would occur prior to initiation of construction activities, pursuant to Section 69-3-108(a) of the Tennessee Water Quality Control Act of 1977 and other State and Federal laws and regulations. These permits could include:

- **Clean Water Act - Section 404 Permit** – required for construction that involves placement of dredge and fill material in Waters of the U.S. and/or impacts to Waters of the U.S. where federally-listed Threatened or Endangered species are present. Typical Waters of the U.S. include rivers, blueline streams, headwaters streams, and special aquatic sites, such as wetlands. Section 404 Permits are issued by the U.S. Army Corps of Engineers (USACE).
- **Aquatic Resource Alteration Permit (ARAP)** – required for any alterations of State waters, including wetlands that do not require a Federal (Section 404) permit. The ARAP permits are required for construction at locations where the proposed project involves placement of fill in the following: a pond that is spring fed or impacts springs; reservoirs; wetlands; blue line streams; intermittent blueline streams on the United States Geologic Survey (USGS) 7.5 quadrangle map; any stream that supports any form of aquatic life; or is in the vicinity of a State-listed endangered species. Tennessee Department of Environment and Conservation (TDEC), Division of Water Pollution Control issues ARAP permits.
- **National Pollutant Discharge Elimination System (NPDES) Stormwater Construction Permit** – required for grubbing, clearing, grading, or excavation of one or more acres of land. TDEC's Division of Water Pollution Control issues NPDES permits.
- **Tennessee Construction General Permit for Storm Water Discharges from Construction Activities (TNCGP)** – required by operators of construction sites in Tennessee.

In addition, the State of Tennessee would require water quality certification under Section 401 of the CWA. Section 401 certification ensures that activities requiring a Federal permit or license will not cause pollution in violation of State water quality standards.

3.22 Section 4(f) Properties

According to Section 4(f) of the Department of Transportation Act of 1966, recodified as 49 United States Code Section 303, "The Secretary [of Transportation] shall not approve any program or project which requires the use of any publicly-owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance as determined by the Federal, State, or local officials having jurisdiction thereof, or any land from an historic structure of Federal, State, or local significance as so determined by such officials unless:

- There is no feasible and prudent alternative to the use of such land; and
- The project includes all possible planning to minimize harm to the land resulting from such use.

There are no existing or proposed public lands, including nature preserves, parks, forests, wildlife management areas, Federal Wild and Scenic Rivers, or Tennessee State Scenic Rivers found within the proposed project area ROW. No naturally occurring unique or notable habitats such as glades, bald cypress/tupelo swamps, or old growth forests, were identified. Some publicly owned lands and notable areas are located in the general vicinity of the project area, but those areas are not anticipated to be impacted by the I-55 Interchange project. Some of the publicly owned lands include Martyr

Park, E.H. Crump Park, Chickasaw Heritage Park (Desoto Park), ant T.O. Fuller State Park (located 4 miles south of the project area).

3.23 Relation of Short-term Use of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

The local short-term impacts of the proposed action and the use of resources for it are consistent with the maintenance and enhancement of long-term productivity for the region. Creation of the project would support growth and development of employment and population in the region. This project would support short-term and long-term goals by improving means of transport into and out of the region.

The level of development anticipated provides the basis for improved delivery of services and goods to and from the region. It should enhance the quality of life as access is improved and traffic travel times throughout the region are reduced. There would be no discernable difference between Alternatives A or B.

3.24 Irreversible and Irretrievable Commitment of Resources

The proposed action would require the expenditure of human and fiscal resources and the potential modification of natural resources. Land and materials utilized in the construction of the project are considered an irreversible commitment.

Land used in the construction of the proposed facilities is considered an irreversible commitment during the period that the land is used for the highway interchange. However, if a greater need arises for the use of the land, or if the highway facilities are no longer needed, the land can be converted to another use. At present, there are no reasonably foreseeable reasons to believe such a conversion would ever be necessary or desirable. Resources affected by construction of the project may be irreversibly altered.

Construction would require the expenditure of materials that are generally not retrievable. Considerable amounts of fossil fuels, labor, and construction materials such as cement, aggregate, iron, gravel, and bituminous material would be expended and large amounts of labor and natural resources are necessary in the fabrication and preparation of construction materials. However, although these materials are generally not retrievable, they are not in short supply and their use would not have an adverse effect upon continued availability of these resources. In addition, construction would also require large, one-time investment of both state and federal funds that are not retrievable.

The commitment of these resources is based on the concept that residents both within the project area, as well as the region, would benefit by improvements in the quality of the local and regional highway transportation system. The facilities would improve the highway capabilities of the region by substantially enhancing accessibility and saving time. The facilities should provide a positive influence on the economy of the region and the livelihood of its citizens.

3.25 Summary of Environmental Consequences

This section was prepared to provide a summary of the potential impacts of each of the proposed alternatives for the project. The Executive Summary also contained a general summary of the environmental consequences associated with the project. Table 3.22 shows side-by-side comparisons of impacts associated with the No-Build Alternative, Alternative A, and Alternative B.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
Land Use & Infrastructure	**Direct Impacts.**	Minor planned changes include mixed used developments north and northeast of project area.	Conversion of currently developed residential and commercial areas to a highway and associated ROW. Displacement of eight residences and one business. Improved accessibility would benefit the remaining businesses within the southwest quadrant of the project area, and those sites currently available for redevelopment.	Similar to Alternative A.
	Indirect Impacts.	None.	Relocation of the displaced residences may result in loss of existing open space.	Similar to Alternative A.
	Cumulative Impacts.	New developments in the area which were previously developed and used for industrial uses.	Increased industrial, residential development, overall improvement of the transportation infrastructure resulting in improved traffic flow and freight movement through the region, and a general revitalization of the south and west Memphis areas. Additional infrastructure projects to provide adequate facilities capable of supporting growth	Similar to Alternative A.
Farmland, Soils, & Physical Resources	**Direct Impacts.**	None.	Construction and earth moving activities would disturb soils resulting in the potential for soil erosion. Minor impacts to topography would be from construction of retaining walls and from grading.	Similar to Alternative A.
	Indirect Impacts.	None.	None.	None.
	Cumulative Impacts.	None.	None.	None.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
Social Environment	**Direct Impacts.**	None.	Adverse impacts on the minority population due to potential displacement and relocation of eight residences and two businesses. Less traffic congestion, improved safety, and minor improvement to noise and air quality is expected. Loss of open space due to project and on the vacant land where displaced residents are anticipated to relocate.	Similar to Alternative A, but with only one business displacement. Eliminate current direct access to Metal Museum Drive.
	Indirect Impacts.	Adverse impacts to the social environment would be anticipated due to continued decreases in the already poor LOS.	The project would enhance community cohesion and provide connections between adjacent areas. Reducing congestion and improving access in the area would improve response times for emergency vehicles.	Eliminate current direct access to Metal Museum Drive.
	Cumulative Impacts.	Additional traffic generated by other non-related projects would result in further decreases in LOS on local roadways. Adverse impacts to the social environment due to increases in traffic congestion and noise and decreases in air quality and safety.	Economic growth of the region would be improved as the infrastructure is modernized, facilitating connections between adjacent areas. The project combined with other new developments, would help to revitalize areas that have become rundown and provide potential increases in quality of life and new opportunities for some residents.	Similar to Alternative A.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
Relocation	**Direct Impacts.**	None.	Ten potential displacements, consisting of eight single-family residences and two businesses.	If it is determined that the Southern Cotton Ginners Association can remain at their present facility, there would be a total of nine potential displacements, consisting of eight single-family residences and one business.
	Indirect Impacts.	None.	This project would have noticeable impacts on the housing market	Similar to Alternative A.
	Cumulative Impacts.	None.	None.	None.
Economics	**Direct Impacts.**	Slow economic growth and development in the portions of Memphis that rely on this interchange.	Potential temporary decrease in the real property tax base and real property tax revenues as a result of the eight residential and two business displacements. New construction-related employment would create additional personal income for the local and regional purchase of consumer goods and services during the construction period. Lower operating expenses, and reduced crash rates for both local daily commuters and travelers, and improved access to the Memphis area providing benefits to local businesses.	Similar to alternative A, but a slight decrease in the real property tax base and real property tax revenues that could be lost as a result only one business displacement. Eliminate current direct access to Metal Museum Drive, eliminating some current through traffic in the local neighborhood, but would also adversely affect the commuting options of the local residents. Consumer access to some local businesses off of Metal Museum Drive would be adversely affected.
	Indirect Impacts.	Adverse economic impacts that could continue well into the future	Additional jobs created both on- and off-site during construction and project development. Additional commercial, industrial, and/or residential development. Property values may increase. Loss of secondary business that may be generated by the two businesses being displaced.	Similar to alternative A, but economic impacts would be slightly reduced due to only one business displacement.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
	Cumulative Impacts.	Decreases in LOS of local roadways could have adverse impacts to the local economy if it deters future development.	Revitalization of some of the former industrial areas, and other new residential, industrial, and commercial developments would result in a combined economic growth in the region.	Similar to Alternative A.
Pedestrians and Bicyclists		None.	The Build Alternatives for this project do not currently include adding facilities for pedestrians or bicycles such as sidewalks or bike lanes as this project is being designed primarily for interstate traffic. Final determinations regarding adding sidewalks or bike lanes will be made during the final design phase of the project.	See Alternative A.
Air Quality	**Direct Impacts.**	Increased emissions from vehicles forced to idle. Some long-term reduction in MSAT levels due to new EPA regulations and eventual fleet turnover that would provide for cleaner engines and fewer MSAT emissions.	This project alone is not expected to result in any substantial impacts to air quality.	Similar to Alternative A.
	Indirect Impacts.	Traffic being forced to utilize other routes in the area resulting in potential decreased LOS, increased congestions, and therefore, increased emissions.	The project could promote secondary developments which could result in additional impacts to air quality	Similar to Alternative A.
	Cumulative Impacts.	Reduced LOS on the existing roadway would combine with potential increased traffic volumes generated by continued regional urban growth and increases in truck traffic.	Regional air quality is expected to improve into the future even with additional development expected in the area.	Similar to Alternative A.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
Noise	**Direct Impacts.**	The No-Build Alternative would result in 24 impacts.	Alternative A would result in 39 impacts.	Alternative b would result in 37 impacts.
	Indirect Impacts.	Impacts for receptors along secondary roadways or other routes used by commuters to bypass congestion would increase noise levels.	Indirect noise impacts could occur due to new developments that may be promoted by the improved traffic conditions on I-55.	Similar to Alternative A.
	Cumulative Impacts.	Impacts would primarily occur along secondary roadways and other routes used by I-55 motorists avoiding congestion. Additional increases in noise levels would occur due to other unrelated, but reasonably foreseeable industrial, commercial, or residential development projects would combine with increased traffic on secondary roadways due to motorists trying to bypass the interchange.	New industrial, commercial, and/or residential development would result in increased noise levels on I-55, including truck traffic.	Similar to Alternative A.
Water Quality	**Direct Impacts.**	None.	None.	None.
	Indirect Impacts.	None	Sediment run-off from construction could cause impacts to water quality downstream. These impacts would be reduced by the use of BMPs. Increase in secondary industrial, commercial, and/or residential developments would increase vehicle traffic and increase the chances for spills of possible pollutants. Decrease congestion and idle time would reduce the chances of vehicles leaking petroleum products, antifreeze, and other chemicals into the storm sewer.	Similar to Alternative A.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
	Cumulative Impacts.	None	If other projects are being constructed during the same period, there would be a chance that sediment run-off from construction could cause impacts to water quality downstream. Decrease congestion and idle time would reduce the chances of vehicles leaking petroleum products, antifreeze, and other chemicals into the storm sewer.	Similar to Alternative A.
Wetlands	**Direct Impacts.**	None.	None.	None.
	Indirect Impacts.	None.	The new interchange may promote additional residential, commercial, and/or industrial developments in the region due to the improved access and traffic flows anticipated. These new developments could increase stormwater and sediment run-off into wetlands downstream of the project.	Similar to Alternative A.
	Cumulative Impacts.	None.	Any impacts to wetlands associated with secondary or induced developments could combine with wetland impacts from past, present, and reasonably foreseeable future projects.	Similar to Alternative A.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
Waterbodies and Wildlife Habitat	**Direct Impacts.**	None.	Short-term direct disturbances to wildlife occurring within the project area would occur from construction activities and noise during construction.	
	Indirect Impacts.	None.	Sediment run-off from construction could cause impacts to waterbodies downstream. These impacts would be reduced by the use of BMPs. Some waterbodies and wildlife habitats could be adversely impacted due to secondary commercial, industrial, and/or residential developments that could be promoted by the improved I-55 Interchange.	Similar to Alternative A.
	Cumulative Impacts.	None.	The combination of new developments would likely result in additional loss or fragmentation of wildlife habitats and may increase erosion and subsequent sedimentation and stormwater runoff into adjacent watercourses.	Similar to Alternative A.
Floodplains	**Direct Impacts.**	None.	None.	None.
	Indirect Impacts.	None.	Secondary developments in the general project area could impact existing floodplain areas, especially if any new industrial development occurs in areas along the Mississippi River south of the project area.	Similar to Alternative A.
	Cumulative Impacts.	None.	Because no floodplains would be directly impacted by this project, it is anticipated that this project would not result in measurable impacts to floodplains even when combined with other past, present, and reasonably foreseeable future projects.	Similar to Alternative A.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
Threatened and Endangered Species	**Direct Impacts.**	None.	None.	
	Indirect Impacts.	None.	If new developments occur along the Mississippi River, especially within riparian areas, there would be some potential for impacts to threatened and endangered species, both terrestrial species such as Indiana bats, and aquatic species, such as mussels. It is unlikely that this project would promote substantial development in such areas.	Similar to Alternative A.
	Cumulative Impacts.	None.	Because no known populations of threatened or endangered species or suitable habitats for them occur in the project vicinity, no substantial impacts would be anticipated. However, other reasonably foreseeable projects in the region could have some impacts to potential suitable habitats for such species.	Similar to Alternative A.
Cultural Resources	**Direct Impacts.**	None.	Direct impacts to archaeological resources (Site 40SY709) during construction. Due to the large size and linear nature of Site 40SY709, it is not possible to completely avoid this site during construction. It is recommended that Phase II testing be completed.	Alternative B would have greater impacts to Site 40SY709, because the E.H. Crump ramp bisects the site through its longest axis.
	Indirect Impacts.	None.	The indirect impacts to archaeological resources (Site 40SY709) would primarily be from the secondary developments that may occur in the vicinity of Site 40SY709 and from displaced residents that may be relocated to a parcel of vacant land south of West Illinois Avenue and east of Metal Museum	Similar to Alternative A.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
			Drive. It is recommended that Phase II testing be completed.	
	Cumulative Impacts.	None.	Cumulative impacts to archaeological resources (Site 40SY709) would primarily be from any secondary development that occurs outside of the TDOT ROW. As currently designed only a small area of Site 40SY709 would be outside of the TDOT ROW. It is recommended that Phase II testing be completed.	Similar to Alternative A.
Hazardous/Special Waste Sites	**Direct Impacts.**	Not improving the existing interchange may result in an increased potential for accidental spills of hazardous or special wastes in the area due to continued reduction in LOS on I-55 and adjacent roadways.	Minor, short-term adverse impacts during construction due to leaks or spills of contaminants from construction equipment. The project would reduce traffic congestion and reduce the chance for accidental spills and leaks of hazardous materials or special waste in the project area.	Similar to Alternative A.
	Indirect Impacts.	As traffic conditions and LOS decline, drivers may choose to use alternative routes increasing the risk of crashes along alternative routes. Crashes increase the risk of accidental spills of fuel, antifreeze, and engine oil in areas outside the immediate project area Increased congestion would force vehicles to remain in the project area for longer periods increasing the chance for potential hazardous and/or special wastes issues. If the existing traffic issues were not improved, it is less likely that abandoned sites containing	Increased highway accessibility and efficiency could result in greater volumes of hazardous materials being transported through the project area. However, more efficient, faster traffic movement through the area would reduce the time that hazardous materials are on the local highways and roads. Removing some traffic from local roadways would help reduce the risk of accidental spills or leaks of hazardous materials along these roadways. Secondary development in the project vicinity would have long-	Similar to Alternative A.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
		hazardous or special wastes would be "cleaned-up" and revitalized, because the area would be less attractive to potential developers and/or buyers. Conversely, not constructing the I-55 Interchange improvements could allow some of the sites to remain idle and therefore potentially reduce the risk of contaminants being disturbed and transported into the air, water, or soils.	term beneficial impacts due to removal and "clean-up" of potentially harmful materials from those sites. Conversely, not constructing the I-55 Interchange improvements could allow some of the sites to remain idle and therefore potentially reduce the risk of contaminants being disturbed and transported into the air, water, or soils. Interchange improvements could promote development of gas stations in the area. Gas stations increase the risk of contamination due to fuel stored in USTs and due to potential spills on the surface	
	Cumulative Impacts.	Similar to the direct impacts from the No Build Alternative, but cumulative impacts would be due to other actions such as continued urban growth in the region.	Cumulative impacts would be beneficial in the project vicinity due to revitalization and "clean-up" of former industrial sites by new developments promoted by the proposed action and unrelated developments.	Similar to Alternative A.
Visual Quality	**Direct Impacts.**	Although general maintenance activities would continue to occur to maintain the function of the roadway, as time goes on, it is likely that the roadway structures and other features, such as guardrails, fencing, landscaping, would continue to deteriorate in visual quality.	Short-term adverse impacts on the visual quality of the project area during construction. Long-term benefits to the immediate project area and ROW. Once the project is completed, the entire area would be perceived by most people as visually improved compared to baseline conditions. Long-term adverse visual impacts for residents of the French Fort Neighborhood who are able to see more of the I-55 ROW and roadway	Similar to Alternative A.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
			than they can currently see	
	Indirect Impacts.	Revitalization or redevelopment of adjacent properties may be slower to occur. This would result in potential long-term adverse impacts, because the existing run-down buildings and properties would remain in place and likely continue to deteriorate.	New development could occur on existing abandoned properties containing run-down and poorly-maintained properties. Replacing those structures with modern buildings and improved landscaping would result in long-term beneficial impacts to visual quality. Some secondary developments may be constructed on previously undeveloped sites resulting in additional loss of open space, forests, or other more visually appealing locations. Displaced residences could be relocated on vacant open land resulting in short-term adverse impacts during construction of the new homes. Long-term visual impacts of the new homes may be perceived as adverse or beneficial depending on individual preferences	Similar to Alternative A.
	Cumulative Impacts.	Similar to the direct impacts from the No Build Alternative, but cumulative impacts would be due to other actions such as continued urban and industrial growth in the region.	Similar to the direct and indirect impacts from Alternative A, but cumulative impacts would be due to other actions such as continued urban and industrial growth in the region.	Similar to Alternative A.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
Energy	**Direct Impacts.**	Traffic congestion would continue to worsen and poor traffic flow would result in extra commitment of energy resources (diesel fuel and gasoline) than would be needed if traffic flowed more freely and efficiently.	Improved traffic flow and reduction in commuting times would decrease the amount of fuel consumption in the region. Short-term adverse impacts would occur due to extra fuel consumption during construction. There could be temporary disruption of electric and gas service in the area while powerlines and/or gas pipelines are relocated (if necessary)	Similar to Alternative A.
	Indirect Impacts.	Use of other roadways in the region as people attempt to use other routes to avoid congestion would result in reduced LOS on these roadways increasing VMT and travel times resulting in increased fuel consumption in the region.	The project would improve LOS on other roadways creating shorter commuting distances or shipping distances for residents, businesses, or industries causing positive impacts to energy. Secondary developments promoted by the project may put more demands on some sources of energy like electric and natural gas.	Similar to Alternative A.
	Cumulative Impacts.	Similar to the direct impacts from the No Build Alternative, but cumulative impacts would be due to other actions such as continued urban and industrial growth in the region. In addition, a minor amount of relief to the potential extra fuel consumption may result from more efficient vehicles.	Similar to the direct and indirect impacts from Alternative A, but cumulative impacts would be due to other actions such as continued urban and industrial growth in the region. In addition, a minor amount of relief to the potential extra fuel consumption may result from more efficient vehicles.	Similar to Alternative A.

Table 3.22. Summary of Environmental Impacts for each Alternative for the I-55 Interchange Project in Memphis, Shelby County, Tennessee.				
Resource Category	**Type of Impact**	**No Build Alternative Impacts**	**Alternative A Impacts**	**Alternative B Impacts**
Construction Impacts	**Impacts.**	None.	Adverse impacts from construction would be primarily short-term in duration. Construction inconveniences such as noise, dust, visual distractions, and traffic conflicts are likely to be unavoidable during the construction phase.	Similar to Alternative A.

CHAPTER 4

4.0 COORDINATION, COMMENTS, and PUBLIC INVOLVEMENT

4.1 Initial Coordination

This EIS is in concurrence with the Tennessee Environmental Streamlining Agreement (TESA). The purpose of TESA is to achieve general agreement between agencies before a project moves forward and to preclude the routine revisiting of decisions that have been agreed to earlier in the process.

On January 22, 2007, TDOT notified a total of 70 Federal, State, and local planning/resource management agencies, private organizations, and other project stakeholders by letter about the proposed Interstate 55 Interchange Project at E.H. Crump Boulevard and South Riverside Boulevard EIS. On May 22, 2002, TDOT mailed letters to 10 groups or tribes representing Native American interests and asked them if they wished to participate in the historic review process for this project as consulting parties. Each party in the initial coordination effort was invited to comment upon any possible environmental, economic, and/or social impacts within their special area(s) of expertise and/or concern. The initial coordination effort afforded concerned agencies, local officials, organizations, tribes, and citizens an opportunity to provide input into the project planning process during the early stages of project development. The initial coordination efforts helped ensure that all foreseeable impacts and concerns were considered in the environmental and location studies to date.

Table 4-1 shows a list of the agencies/organizations contacted. A total of 16 responses to the initial coordination letters were received. Copies of these responses are available in the Appendix A.

Table 4.1. List of Agencies Involved in the Initial Coordination for the Interstate 55 Interchange EIS.

AGENCY TYPE	NAME	RESPONSE RECEIVED
Federal	United States Department of Defense U.S. Army Corps of Engineers-Memphis District Regulatory Functions Branch	**X**
Federal	United States Department of Defense U.S. Army Corps of Engineers-Nashville District Water Resources Division	
Federal	U.S. Department of Agriculture Natural Resources Conservation Service	**X**
Federal	Department of Housing and Urban Development	
Federal	U.S. Department of Commerce National Oceanic and Atmospheric Administration	
Federal	U.S. Coast Guard Eighth Coast Guard District	**X**
Federal	Federal Railroad Administration Office of Economic Analysis	
Federal	Environmental Protection Agency Environmental Assessment Office	**X**
Federal	U.S. Department of the Interior Office of Surface Mining	
Federal	U.S. Department of Interior U.S. Geological Survey Office of Environmental Affairs	

Table 4.1. List of Agencies Involved in the Initial Coordination for the Interstate 55 Interchange EIS.

AGENCY TYPE	NAME	RESPONSE RECEIVED
Federal	U.S. Department of the Interior National Park Service Planning and Compliance Division	
Federal	U.S. Department of Interior U.S. Fish and Wildlife Service	**X**
Federal	Federal Aviation Administration	
Federal	Federal Emergency Management Agency	
Federal	Federal Energy Regulatory Commission	
State	Tennessee Department of Economic & Community Develop. NEPA Contact	**X**
State	Tennessee Department of Environment & Conservation Division of Air Pollution Control	**X**
State	Tennessee Department of Environment & Conservation Division of Ground Water Protection	
State	Tennessee Department of Environment & Conservation Division of Natural Areas	
State	Tennessee Department of Environment & Conservation Division of Solid and Hazardous Waste Management	
State	Tennessee Department of Environment & Conservation Division of Water Pollution Control	
State	Tennessee Department of Environment & Conservation Division of Water Supply	**X**
State	Tennessee Department of Environment & Conservation Commissioner	
State	Tennessee Department of Environment & Conservation Tennessee Historical Commission	**X**
State	Tennessee Wildlife Resources Agency NEPA Contact	**X**
Local	Memphis and Shelby County Office of Planning and Development Transportation Coordinator	
Local	Memphis Area Transit Authority	
Local	Mr. A.C. Wharton Mayor of Shelby County, Tennessee	
Local	Shelby County Division of Planning and Development	
Local	Shelby County Board of Commissioners Office	
Local	Memphis and Shelby County Port Commission	
Local	Mr. Willie W. Herenton Mayor of Memphis	
Local	Center City Commission	
Local	Memphis Area Transit Authority	
Local	Tennessee Trails Association	
Local	Memphis Area Association of Governments	
Local	Honorable Barbara Cooper State Representative	

Table 4.1. List of Agencies Involved in the Initial Coordination for the Interstate 55 Interchange EIS.

AGENCY TYPE	NAME	RESPONSE RECEIVED
Local	Honorable John Deberry State Representative	
Local	Honorable Harold Ford State Representative	
Local	Honorable Ophelia Ford State Senator	
Local	Park Services	
Local	Memphis City Council	
Local	Memphis Heritage, Inc	
Local	Historic Zoning Commission	
Local	Memphis City Schools	
Local	National Ornamental Metal Museum	
Local	Memphis and Shelby County Planning and Development Memphis Landmarks Commission	
Local	Housing and Community Development	
Local	Center for Neighborhoods	
Local	City of Memphis-Engineering	**X**
Local	City of Memphis-Public Works	
Private	French Fort Community Organization	
Private	Southern Cotton Ginners Association	**X**
Private	G & W Diesel Services	
Private	Hershey Chocolate & Confectionery	
Private	Cooper Freight Services	
Private	D Canale Beverages, Inc.	
Private	Highland Systems, Inc.	
Private	Exxon Mobil Memphis Terminal	
Private	American Commercial Terminal	**X**
Private	Economy Boat Store	
Private	West Tennessee Historical Society	
Private	Real Estate Investments	**X**
Private	National Association for the Advancement of Colored People (NAACP)	
Private	Tennessee Conservation League	
Private	World Wildlife Fund	
Private	Tennessee Trails Association	
Private	Sierra Club	
Private	Tennessee Environmental Council	
Private	The Nature Conservancy	
Tribe/Group Representative	Quapaw Tribe of Oklahoma	
Tribe/Group Representative	Eastern Shawnee Tribe of Oklahoma	
Tribe/Group Representative	United Keetowah Band of Cherokee Indians	

Table 4.1. List of Agencies Involved in the Initial Coordination for the Interstate 55 Interchange EIS.

AGENCY TYPE	NAME	RESPONSE RECEIVED
Tribe/Group Representative	Muscogee (Creek) Nation	**X**
Tribe/Group Representative	Choctaw Nation of Oklahoma	
Tribe/Group Representative	Chickasaw Nation	**X**
Tribe/Group Representative	Alabama-Quassarte Tribal Town	
Tribe/Group Representative	Kialegee Tribal Town	
Tribe/Group Representative	Thlopthlocco Tribal Town	
Tribe/Group Representative	Shawnee Tribe	

4.1.1 Summary and Disposition of Comments Received during Initial Coordination

Sixteen replies have been received from federal, state, and local planning/resource management agencies, Native American Nations/ Tribes, and private groups. The following is a brief summary of the initial coordination replies. One additional letter was received from the Presidents Island Industrial Association, Inc. and a brief summary of that letter is included below. Copies of the original response letters are attached in Appendix A.

Federal Agencies

U.S. Army Corps of Engineers – Memphis District

Regulatory Branch

Response Letter dated March 8, 2007

SUMMARY

- "…our preliminary jurisdictional determination is that no wetlands or other waters of the United States are present within the project area and that no Department of the Army permits would be required for this project."
    - "…we must decline the offer to become a participating agency in this process, because we have no jurisdiction over the project."
    - "Based on the preliminary review by the District Archaeologist, it appears that the project area may be part of a prehistoric/historic/civil war site associated with Chickasaw Bluffs; because this is a highly sensitive cultural area, additional surveys will likely be required."

DISPOSITION

- The comments regarding the USACE jurisdiction over the project and their decline to become a participating agency are noted.
- TDOT appreciates the USACE preliminary review of cultural resources data for the project area. Additional cultural resources surveys have been conducted for this project,

and TDOT will continue to correspond with the SHPO regarding cultural resources issues. Phase II surveys will be conducted for one site discovered within the APE during the Phase I surveys, Site 40SY709, which includes remnants of Fort Pickering fortifications, dating to the Civil War Period and among other artifacts.

U.S. Environmental Protection Agency

NEPA Program Office, Office of Policy and Management

Response Letter dated February 26, 2007

SUMMARY

- "…we accept your invitation to become a participating agency for this project…EPA supports the utilization of the TESA process for this project."
- "…the Draft EIS should include a thorough analysis of future traffic conditions on the proposed facility, with a particular emphasis on estimating future truck traffic. This information is critical for the purposes of completing the air quality and noise impacts assessment and should be split out and reported directly."
- "EPA is concerned about substantial noise impacts to adjacent residential communities. Noise abatement should be considered when project noise impacts approach FHWA Noise Abatement Criteria or meet or exceed the existing noise levels by incremental increases of 10 dBA or greater."
- "The Memphis area, including Shelby County, is designated nonattainment for the 8-hour ozone standard effective June 2004. In addition, Shelby County is considered a maintenance area for carbon monoxide….a discussion of this area's status with regard to those standards should be included in the Draft EIS. In addition, it should be confirmed that the project is included in the most recent air quality conformity analysis for the Memphis 8-hour ozone attainment area."
- "EPA recommends that the Draft EIS disclose potential MSAT emission impacts resulting from each of the build alternatives (including construction activities) for purposes of comparison…Analytical approaches that would lead to an understanding of potential increases (or decreases) in exposures to these target populations will typically require the development of emissions inventories for the various build alternatives and may also require dispersion modeling. The overall analysis should assess the cumulative impact posed by the project in combination with exposures to chemicals that result from other sources which impact the study area…"
- The project information identified the potential for environmental justice (EJ) concerns associated with impacts to the nearby French Fort neighborhood. The Draft EIS should identify areas with significant percentages of low-income and minority populations that would be affected by the build alternatives and determine the extent to which there would be significant differences between alternatives in impacts to these communities. When analyzing these impacts, it is important to assess both the negative and positive impacts…the impact assessment should also look at other categories such as noise, air quality, and economic impacts."

DISPOSITION

- TDOT acknowledges EPA's acceptance to become a participating agency for the project. The TESA process has been, and will continue to be, utilized for this project.
- Traffic analyses were conducted for this project, including estimates of truck percentages. This data was incorporated into air quality and noise studies conducted for the project. Traffic data is reported in Chapter 1 and Chapter 3 and air quality and noise impact assessments are reported in Chapter 3 of the EIS.
- Noise impacts were assessed and noise abatement analyses results were discussed in Chapter 3 under the Noise section.
- This project was evaluated for air quality impacts. Chapter 3 contains detailed discussions of air quality analyses and conformity results.
- The MSAT discussions are included in the Air Quality section of Chapter 3.
- Environmental Justice concerns have been evaluated and are discussed in Chapter 3. TDOT has worked closely with the French Fort community throughout the development of this project and will continue to address any concerns that arise. Due to the nature of this project and its proximity to the French Fort neighborhood, there is no reasonable build alternative available that would completely avoid impacts to the French Fort community. The City of Memphis has made vacant land in the French Fort neighborhood available for displaced persons.

U.S. Fish and Wildlife Service

Field Supervisor

Response Letter dated February 6, 2007

SUMMARY

- "No significant adverse impacts to wetlands or federally listed endangered or threatened species are anticipated from this proposal."

DISPOSITION

- TDOT concurs with the USFWS that no adverse impacts to wetlands or federally listed species would occur due to this project.

Natural Resources Conservation Service

Response Letter dated January 29, 2007

SUMMARY

- "…NRCS renders a No Effects assessment for the detailed project description."

DISPOSITION

- TDOT concurs with the NRCS that there would be no measurable effect to resources under their jurisdiction or area of expertise due to the urban/previously developed project setting. There would be no impacts to farmland.

U.S. Coast Guard

Bridge Administrator by direction of the District Commander

Response Letter dated February 21, 2007

SUMMARY

- "…this project is not a project over which the Coast Guard exercises jurisdiction for bridge administration purposes. A Coast Guard permit is not required."

DISPOSITION

- TDOT concurs with the Coast Guard that this project would not affect bridges or other resources under their jurisdiction.

State Agencies

Tennessee Department of Environment and Conservation

Tennessee Historical Commission

State Historic Preservation Office

Response Letter dated January 29, 2007

SUMMARY

- "…Considering available information, we find that the project as currently proposed MAY AFFECT PROPERTIES THAT ARE ELIGIBLE FOR LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES. You should continue consultation with our office, designated consulting parties and invite them to participate in consultation, and provide us with appropriate survey documentation for review and comment."

DISPOSITION

- TDOT has continued consultation with the SHPO and has conducted a Phase 1 archaeological survey of the project area. Based on those surveys, the SHPO has required that a Phase II survey be completed for one site discovered within the APE during the Phase I surveys, Site 40SY709, which includes remnants of Fort Pickering fortifications, dating to the Civil War Period and among other artifacts.
- Findings of the surveys are discussed in Chapter 3 under the Cultural Resources section and a conclusion. Copies of the SHPO coordination letters are contained in Appendix B.

Tennessee Department of Environment and Conservation

Division of Water Supply

Ground Water Management Section

Response Letter dated February 13, 2007

SUMMARY

- "A review of the community water supplies in the Shelby County area show that the area of the improvement project is not in the vicinity of any of Memphis Light Gas and Water's wellfields or wellhead protection areas."

DISPOSITION

- TDOT concurs with TDEC that this project would not impact wellfields or wellhead protection areas.

Tennessee Department of Environment and Conservation

Division of Air Pollution Control

Response Letter dated February 21, 2007

SUMMARY

- "This project is in a Carbon Monoxide and Ozone Maintenance area and is therefore subject to Chapter 1200-3-34, Transportation Conformity. If not already contained in the Memphis Metropolitan Planning Organization's latest approved Long Range Transportation Plan, the project would have to be added to meet the Transportation Conformity Requirements."
- "The agency's other interest…concerns the control of fugitive dust and equipment exhaust emissions during the construction phase, and the assurance that any structures requiring demolition are asbestos free."

DISPOSITION

- The project is included in the latest approved Long Range Transportation Plan, and meets the Transportation Conformity Requirements.
- Fugitive dust and equipment exhaust emissions concerns are noted. TDOT will implement measures to help control dust and minimize equipment exhaust to the extent practical. These concerns are discussed in more detail in Chapter 3.

Tennessee Wildlife Resources Agency

Response Letter dated March 6, 2007

SUMMARY

- "We currently have little concern regarding potential stream and wetland impacts that may occur due to construction of this project."
- "We accept the invitation to participate in this process and encourage continued consultation with our agency in future phases of this project to reduce impacts to fish and wildlife resources."

DISPOSITION

- TDOT agrees that this project would have minimal to no impacts on streams or wetlands.
- TDOT appreciates TWRA's acceptance of the invitation to become a participating agency and will continue to coordinate with the agency in future phases of the project.

Tennessee Department of Economic and Community Development

Business Development Division

Response Letter dated February 21, 2007

SUMMARY

- "While the department always encourages improvements to Tennessee's road network, we have no other specific comments on the project."
- "Our Division of Local Planning has checked the proximity of the project to flood affected areas and found it to be removed from such."
- "…we respectfully decline the invitation to become a participating agency for the reasons that this department has no jurisdictional authority with respect to the project, …has no further expertise or information relevant to the project, and …does not intend to submit further comments on the project."

DISPOSITION

- TDOT concurs that the project is not in a flood affected area.
- TDOT appreciates TDECD's response and understands that there is no further need for TDECD to remain involved with this project at this time. TDOT will only continue to coordinate with TDECD for this project if new information arises or the project scope is changed such that it could potentially influence TDECD.

Local Agencies/Organizations

City of Memphis

Division of Engineering

Response Letter dated February 1, 2007

SUMMARY

- "The City is very supportive of the project and in agreement with the two proposed build alternatives."
- "To my knowledge, the only special interest group in the area that has not been a part of the previous meetings is the Cherokee Nation. …City of Memphis employee, will provide some information on that group."
- "The informational newsletter that has been developed is a good tool to publicize this interchange modification project and should alert any group that may have an interest in the project that has not previously been identified."

DISPOSITION

- TDOT has coordinated with the Cherokee Nation and the referenced City of Memphis employee.
- TDOT will continue to develop periodic newsletters and will continue to update the project website to report project updates, status, and any other new information as it becomes available.

Southern Cotton Ginners Association

Response Letter dated March 7, 2007

SUMMARY

- "We were original property owners in this location and have had this as our headquarters location since 1967…This location has served us well in terms of location and functionality all these years…We have just completed our 55th show which brings in 15-20,000 people over two days to see exhibits from 48 states and 6 foreign countries."
- "As our Executive Committee and Board reviewed both options there were several points made that, based on current information, are of concern to us.
- Both option A and B will significantly impact the current functionality of our Association and its future plans.
    1. The French Fort community and surrounding areas have been excellent neighbors for many years, and we respect their neighborhood and business concerns.
    2. Option A seems to clearly eliminate our building and if so, further considerations and discussions may be irrelevant. We, of course, would have to relocate and would want fair compensation.
    3. Option B would not…eliminate our building. However, in effect, it would dramatically reduce our current functionality. Our members…would not have a ready and easy access from the west of the I-55 Bridge. Additionally, we have enjoyed access from Alston Street to the rear of our building…This access has long been granted by the Mississippi RV Park ownership and management.
    4. After our initial building was constructed, the property adjacent was sold to the Mississippi River RV Park. Their building is attached to our original building and thus any alteration to their facility would likely render our building virtually useless and could not be done without permanent damage.
    5. We have no further need for expansion or additional space requirement but the current functionality we have is critical to our continuing operation.
    6. In conclusion, it is our initial opinion that both options A and B, for different reasons, will render our current building location and functionality very significantly damaged if not useless."
- "There is, no doubt, of the need for this improvement from a transportation efficiency and safety standpoint. Our business, beyond our office location concerns, is dependent upon efficient and safe transportation and a change to this interchange is long overdue."

DISPOSITION

- TDOT acknowledges the concerns raised by the Southern Cotton Ginners Association. However, due to the nature of this project and limitations in terms of lack of sufficient undeveloped land in the area and numerous constraints, TDOT was unable to identify other reasonable alternatives that could completely avoid impacting the Southern Cotton Ginners Association's facilities or operations. In order to completely avoid the Southern Cotton Ginners Association facilities, the interchange would have needed to have been located in an area that would impact additional residences and/or large businesses/employers in the area, which would have resulted in substantial long-term adverse impacts to the community as a whole. TDOT will continue to work with the Southern Cotton Ginners Association to try to identify any option that could help lessen the impact to their organization.
- TDOT concurs with the need for this improvement due to efficiency and safety issues, and this project is being developed to help improve the existing transportation facilities in the area.

Real Estate Investments

Response Letter dated February 28, 2007

SUMMARY

- "I am the managing partner and fifty percent owner of Desoto Pointe Partners. The partnership owns two pieces of property in the French Fort area. One is the old U.S. Marine Hospital, which lies on 3.17 acres and the other is the former Quality Inn property, which lies on 2.69 acres. Our plans are to convert the three existing buildings on the Hospital property to thirty-three condominiums and to construct on the Quality Inn property an apartment complex of up to eighty-five units at a cost of $10M upwards and renovate the existing building at a cost of approximately $6M for hotel, apartments, commercial, or etc. This will rid the area of a considerable amount of blight and certainly will be the catalyst for further revitalization of the area."
- "I am opposed to Alternative B and believe that Alternative A is best for the community and City of Memphis. It is hard for me to believe that …serious consideration would be given to an alternative road system that would further disconnect a community from the downtown core…Many cities are trying to reattach certain areas, which have been cut off by Interstate systems."
- "If there is a concern of traffic in the neighborhood, beyond the fact that (Alternative) "A" would make it less desirable to cut thru; rather than go to (Alternative) "B" I think traffic can be impeded or discouraged by a few changes, such as speed bumps, median strips, on wider roads, signage, and etc."
- "Alternative A would reconnect the area to the downtown core. I suggest a side walk from Illinois Avenue to Georgia Avenue. In the future under (Alternative) "A" there might be some possibility of alternate transportation system to and from downtown but with (Alternative) "B" I think it is much less likely."

DISPOSITION

- TDOT appreciates the information regarding the potential development plans in the area. The development of the referenced properties will be considered in the EIS and throughout the planning process.
- It is anticipated that the proposed interchange improvements would complement the potential revitalization of the surrounding areas by improving overall traffic flow through the area. The commenter's preference for Alternative A due to its potential to help reconnect the area to the downtown core has been documented and will be considered during the alternative selection process.
- TDOT will continue to coordinate with project stakeholders throughout the remainder of the project planning and design phase to ensure that the resulting new interchange meets the purpose and need for this project, and to the extent possible, conforms to local development plans and concepts. Details of the project design, including proposed sidewalks and other potential features, will be refined during the design phase of the project once an alternative has been selected.

American Commercial Lines (ACL) Transportation Services LLC

Response Letter dated March 8, 2007

SUMMARY

- "ACL Transportation Services (ACL TS) handles a variety of non-hazardous, bulk liquid products in above ground tanks…Truck activity may reach thirty (30) to forty (40) semi truck loads per day between the hours of 6:00 AM to 4:00 PM…Currently access to ACL TS is via the west-bound exit at Crump Boulevard/I-55 North onto the Metal Museum Drive exit and turning right on Illinois Avenue via the current Metal Museum Drive exit ramp. An auxiliary route is available by exiting off of I-55 South onto McLemore Avenue to gain access to Illinois Avenue. McLemore leads to President's Island. However, this route is unavailable for commercial truck traffic, as commercial truck traffic is impermissible around Desoto Park, under current Memphis traffic laws. The introduction of any additional truck traffic to this exit will greatly increase congestion on the already heavily trafficked McLemore Avenue and create a potentially unsafe traffic zone. Because of railroad access to the island, traffic is halted during railroad usage. Trains crossing at the junction of McLemore and the Jack Carley Causeway (the main road to the island) prevent all traffic from entering or leaving the area."
- "Making this proposed change to the I-55 interchange is greatly needed as numerous vehicle casualties have resulted due to the increased traffic and poor access to the next leg of the interstate. However, ACL TS's business and revenue is dependent upon the product transport by truck. Because of the facility's size and river access location, it is neither economically feasible nor practical to relocate the whole of the facility. Safe and unimpeded access to and from our facility and our neighboring businesses is essential for our continued operations and continued success within the City of Memphis."
- "Given the two options, Alternative A is preferred because Alternative B does not include any direct access to Illinois Avenue and would cause severe business interruption to ACL TS. In the event Alternative B is chosen, access to our facility will greatly impact the residents of the French Fort neighborhood, including potential property devaluation, from the increased presence of commercial truck traffic."

DISPOSITION

- TDOT appreciates the information regarding your businesses transportation requirements. It is anticipated that the proposed interchange improvements would provide your business with improved transportation efficiency by removing some of the congestion from the existing interchange area. The commenter's preference for Alternative A due to its potential to provide a better connection to your business has been documented and will be considered during the alternative selection process.
- TDOT will continue to coordinate with project stakeholders throughout the project planning and design phase to ensure that the resulting new interchange meets the purpose and need for this project, and to the extent possible, maintains access to the area for local residents and businesses. Details of the project design will be refined during the design phase of the project when, or if, a general layout under a build alternative has been selected.

Presidents Island Industrial Association, Inc.

Letter dated June 30, 2008 (not an Initial Coordination response)

SUMMARY

- "Our main issue is that access to and from President's Island from Crump at the Bridge should not be restricted any more than it is now. All involved must consider the necessity of EMERGENCY EVACUATION routes from President's Island and this Crump access needs to flow as freely as possible."
- "Also trains sometimes block the main Island entrance. Routes to the North of the Causeway/Riverside intersection must remain an exit option."

DISPOSITION

- TDOT will take the comments regarding access issues to Presidents Island and other surrounding areas into consideration during the alternative selection process.
- TDOT will continue to coordinate with project stakeholders throughout the project planning and design phase to ensure that the resulting new interchange meets the purpose and need for this project, and to the extent possible, maintains access to the area for local residents and businesses. Details of the project design will be refined during the design phase of the project when, or if, a preferred alternative has been selected.

Tribes/Group Representatives

The Chickasaw Nation and Muscogee (Creek) Nation were the only respondents to the Section 106 Consultation efforts for this project. The former requested to be notified only in the event of an inadvertent discovery, while the latter requested to be a Consulting Party on the project. TDOT will continue to coordinate with the Muscogee (Creek) Nation as a Consulting Party.

4.2 Public Involvement Activities

4.2.1 Public Information and Scoping Meetings

Briefings with local government officials and/or identified stakeholders have been used as a method to provide project updates at specific milestones and facilitate the flow of information between the officials, stakeholders, TDOT, and FHWA. Meetings with officials and stakeholders have occurred throughout the development of this project including meetings in October 2004, October 2005, December 2005, and March 2007. The meetings focused on providing project updates, sharing available information, and solving large issues of concern such as identifying ways to minimize impacts to residents of the French Fort neighborhood and local businesses.

4.2.1.1 Summary/Disposition of Comments Raised during Public Involvement Activities

This section contains a brief summary of comments or concerns raised during past meetings held since the official start of the EIS study for this project in September 2004. Also, see Section 4.2.3 below for a link to additional frequently asked questions (FAQs) that have arisen during the life of the project to date.

SUMMARY

- "Fort Pickering was located in the French Fort area near the Indian mounds, which were used as munitions dumps during the Civil War. In the late 1950s and early 1960s urban renewal was introduced into the area by the City, which cleared the land and tried to market the residential improvements to whites. When that failed, the City tried to market the residential improvements to whites and blacks. When that effort failed to attract investors, the City basically turned the area over to black citizens, who built the delightful community we see today, which everyone who lives there regards as a piece of heaven. Various businesses have tried to take over parts of the neighborhood but have largely been unsuccessful. At one point the City closed a street but was forced by community pressure to re-open it. Although many of the original residents are elderly, large numbers of their children are buying the residential properties and moving into the neighborhood. There's no doubt that the proposed interstate improvements will disrupt the neighborhood. One of the main questions/concerns is where the displaced home-owners will be re-located. A larger issue involves fairness and social justice, both for the displaced homeowners and for the entire community."
- "The French Fort neighborhood wants a simple process that treats the community and affected homeowners fairly and provides options in terms of relocation. The homeowners who will be displaced and the community come first in terms of fairness and social justice. They understand that business owners in the area are concerned about construction of the interchange, but it is the French Fort community that will be affected the most. Therefore, the needs and well-being of the residents should be the most important considerations and not those of marginally affected businesses."

DISPOSITION

- TDOT has been in coordination with the French Fort neighborhood since the time these comments arose. TDOT, the City of Memphis, and the French Fort residents have reached a consensus that a parcel of vacant city-owned land adjacent to the neighborhood will be made available to be used as a location where replacement homes could be located for those displacees who choose to build new homes. This would allow displaced residents to remain part of the neighborhood.

SUMMARY

- "Another important question concerns early buy-out. That issue is vital to many of the potentially displaced homeowners owing to their advanced age. Making them wait three, four, or five years or even more would put them at a great disadvantage, upset their lives, and cause them great uncertainty. The best thing the State could do is to create a win-win situation for all involved neighborhood participants in terms of the timing of the buy-out and construction of replacement housing. It is critical that the residents who are to be bought out are treated fairly, and the neighborhood is not adversely affected."
- "The timeline as to buy-out and relocation of affected residents is a CRITICAL issue to the community and should be addressed in the EIS, especially since many of the people who could be displaced are elderly. Their lives would be most negatively affected by the uncertainty of whether and when they would be forced out of their homes."

DISPOSITION

- The TDOT Right-of-Way Division Relocation and Property Management Office is responsible for the prompt and equitable relocation and reestablishment of persons and businesses which are displaced as a result of the I-55 Interchange Project at E.H. Crump Boulevard and South Riverside Boulevard. A relocation agent from the State will maintain continuous contact with those being relocated. Relocation payments will be explained in accordance with eligibility. Housing needs will be determined as well as needs for assistance. Persons being relocated cannot be required to move unless comparable property is made available to them. Ample notice and time for relocation will be given to the occupant. More information on the relocation process can obtained from the following TDOT website links or by calling TDOT at (615) 741-3196. http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/row/relocation.pdf http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/row/relocation.htm .

SUMMARY

- "The developer of the old Marine Hospital wants to acquire the 1.7-acre property located at West Illinois Avenue and Riverside Drive for their own use, however the neighborhood residents strongly oppose that type of development on the site and want the City and the Housing Authority to guarantee that that will not happen."

DISPOSITION

- The City of Memphis is in the process of making the vacant lot at the southwest corner of Riverside Boulevard and Illinois Avenue available for families that are relocated. TDOT cannot provide comment on any other potential land transactions in the area that are unrelated to the I-55 Interchange Project.

SUMMARY

- "There was a general consensus that if a newsletter is to be produced as part of the public involvement process, it should be specific as to what happens, when, where, and to whom with regard to the project and not just contain meaningless things that are unimportant."

DISPOSITION

- It was determined that newsletters would only be sent out when new, meaningful information was available to help keep citizens and stakeholders apprised of the latest project developments. TDOT has developed newsletters for this project that provided stakeholders with updated information related to the project. The newsletters were aimed at keeping them up to date with the latest project developments and providing them with answers to their previous questions or concerns. Additional newsletters will be sent as appropriate.

4.2.2 Newsletters, Project Website, and Other Outreach Efforts

As mentioned in the above section, newsletters have been prepared to inform the project area residents, business and property owners, interested citizens, local agency officials, local public officials, and any other interested stakeholders about the status of the project at various project milestones. Newsletters will continue to be sent to stakeholders at various milestones throughout the remainder of the planning stage of the project.

The project website, http://www.tdot.state.tn.us/i55/default.htm , has been, and will continue to be, periodically updated with newsletters, maps, and other project information, as appropriate or when new information is available. The website also provides links to project contacts so that comments or concerns can be sent directly to TDOT staff.

4.2.3 Frequently Asked Questions

The project website contains answers to frequently asked questions (FAQs) regarding the project. Many of those questions were brought up during previous public meetings or through general questions submitted to TDOT from local residents or stakeholders. To view the questions and answers visit the project website: http://www.tdot.state.tn.us/i55/default.htm .

4.2.4 Public Review of the Draft Environmental Impact Statement

A copy of the notice of availability of the DEIS document will be published in local papers and on the project website once it has been approved. The notice will identify where the DEIS is available for public review, how the public can provide input, and who to contact with comments or for additional information. Copies of the DEIS will be made available for public inspection at local public libraries in the Memphis area. The DEIS will also be available in electronic format on the TDOT project website at http://www.tdot.state.tn.us/i55/default.htm . Several agencies, public officials, and other primary project stakeholders will be sent copies of the DEIS to review. A list of those agencies, official, and stakeholders is contained in Appendix C.

During the official public review period of the DEIS, TDOT will hold a public hearing to solicit public input on the official findings presented in the document and/or on the project in general. Input from the public hearing and public comment period will be used by TDOT to make a decision on the selection of the preferred alternative and preliminary mitigation measures. This input will also be incorporated into the overall study prior to completion of the Final EIS and Record of Decision (ROD).

The following methods can be used to provide comments on the information contained in the DEIS or other general project specific concerns:

- Comment form drop box located at the DEIS Public Hearing;
- Mail-in comment forms distributed at the DEIS Public Hearing;
- Oral comments via court reporter(s) at the DEIS Public Hearing;
- Electronic comment forms available on the project web site;

- Mail-in letters sent to TDOT at the address listed on the signature page located in the front of the DEIS;
- Telephone; and
- E-Mail.

4.2 Tennessee Environmental Streamlining Agreement Reviews

In accordance with the Tennessee Environmental Streamlining Agreement (TESA), TDOT provided TESA signatory agencies involved with the review of the I-55 Interchange project with materials related to the Purpose and Need and Study Area (Concurrence Point 1), and Project Alternatives to be Evaluated in the EIS (Concurrence Point 2). The Concurrence Point 1 and Concurrence Point 2 packages were sent to the agencies on September 21, 2007. The agencies were provided a 45-day review period.

The Tennessee Wildlife Resources Agency (TWRA) submitted a signed letter stating their concurrence with both Concurrence Point 1 and Concurrence Point 2. No advisory comments were provided with the TWRA response. Based on the TESA agreement, it was assumed that those agencies that did not submit the signed concurrence forms or request an extension of time to review the materials, agreed with the information contained in the Concurrence Point 1 and Concurrence Point 2 packages. Therefore, Concurrence Point 1 and Concurrence Point 2 were deemed complete on November 5, 2007.

CHAPTER 5

5.0 LIST OF PREPARERS

Personnel involved in the development of the I-55 Interchange EIS include the following:

Name	Education and Experience	Primary Responsibilities
Robert McIvor Parsons	B.S. Civil Engineering, 30 years of planning and design of transportation facilities.	Program Manager
Luke Eggering Parsons	B.S., Fish and Wildlife Management; M.S., Biology; 18 years experience in wetland management; wildlife, fisheries and endangered species management; preparation of environmental documents.	Project Manager/Project Scientist; data collection and key participant in description of proposed action, alternatives formulation, environmental impact analysis, public involvement, and preparation of the EIS.
Joel Budnik Parsons	B.S. Fisheries and Wildlife Management, Minor in Biology; M.S. Fisheries and Wildlife Sciences; 11 years experience in natural resource management; biological surveys, wetland determinations; environmental impact assessment; and preparation of environmental documents.	Senior Environmental Scientist/Biologist; key participant in agency coordination, data collection, environmental impact analysis, and preparation of the EIS.
Mike Brugge Parsons	B.S., Civil Engineering; M.S. Highway & Traffic Engineering; 29 years of experience in transportation with a focus on traffic engineering and transportation planning.	Traffic engineer for capacity analyses and other traffic operations analyses. Provided Levels of Service for air quality and noise analyses.
Kevin Abel Parsons	B.S. Civil Engineering; 9 years of experience on roadway planning and traffic studies as well as roadway design projects.	Assisted in performing highway and intersection capacity analyses included in the EIS for build and no-build conditions. Conducted ambient noise readings at various locations in the project area.
Don Beisel Parsons	B.S. Geography; M.A. Geography; 31 years of experience in community/urban planning, environmental planning, and socioeconomic studies.	Senior Project Planner/Economist; data collection and preparation of socioeconomic analysis and related sections of EIS.
Edward Cain Parsons	B.S. Civil Engineering; 40 years experience in the planning and design of major transportation facilities and preparation of environmental documents.	Senior Transportation Engineer/Planner; oversight on traffic issues, site development, and air and noise analyses.
Robert Ernst Parsons	BS Geography/Geology, MA Geography, PhD Geography/Urban Analysis; 39 years experience in urban planning, economic development, market analysis, and environmental planning projects.	Senior Land Use Planner/Land Economist; conducted economic analysis during alternatives development phase of project.

Name	Education and Experience	Primary Responsibilities
Lee Gorday Parsons	B.A., Geology; M.A. Geology; 22 years of experience in hydrogeologic systems and groundwater contamination.	Senior Hydrogeologist/Hazardous Materials Specialist; data collection oversight and preparation of related sections of EIS.
Janet Lewandowski Parsons	A.A.S., Technical Illustration, 27 years of experience in AutoCad and MicroStation, 5 years experience in ArcView and 2 years experience in ArcGIS.	CAD/GIS Specialist assisted with generating graphics and maps.
Darren Mitchell Parsons	B.S. Biology; M.S. Biology; 7 years experience in fish and wildlife biology and management, and aquatic entomology and ecology.	Environmental Scientist/Biologist; data collection, impact analysis, and key participant in preparation of EIS.
Anthony Pakeltis Parsons	B.S. Environmental Design; B.U.P. Urban Planning and Development; MUPP Urban Planning and Policy (Transportation); 18 years experience in environmental assessment and impact studies, including air quality, noise, socioeconomic, and traffic analysis.	Air Quality and Noise Analyst; air quality and noise analysis studies.
Matt Schulte Parsons	B.A. English Lit & Writing; M.S. Geographical Studies, emphasis in Spatial analysis and Geo-Information Technologies, 11 years experience in GIS and Environmental Planning.	GIS Analyst/Planner; coordinated GIS data acquisition and processing, checked data accuracy and consistency, and produced maps for various project uses.
Guy G. Weaver, Weaver and Associates, LLC		Principal Investigator and Project Manager for Phase 1 Cultural Resources Survey for project.
Warren J. Oster Weaver and Associates, LLC		Field Director and primary author of the Phase 1 Cultural Resources Survey Report; prepared Phase 1 graphics.
Dr. Carl Kuttruff Weaver and Associates, LLC		Lead for trench excavation and additional research on Fort Pickering in support of the Phase 1 Cultural Resources Survey.
Carolyn Crum Weaver and Associates, LLC		Conducted archival research specific to the historical background and residential history of the area in support of the Phase 1 Cultural Resources Survey.
Avery Pribila Weaver and Associates, LLC		Conducted archival research specific to the historical background and residential history of the area in support of the Phase 1 Cultural Resources Survey.
Anna Inman Weaver and Associates, LLC		Lab Analyst in support of the Phase 1 Cultural Resources Survey; prepared Phase 1 Report graphics.

Name	Education and Experience	Primary Responsibilities
Charles Parris Stripling Weaver and Associates, LLC		Preliminary site files research at the Tennessee Division of Archaeology and Tennessee Historical Commission in support of the Phase 1 Cultural Resources Survey.
John Steele Federal Highway Administration	FHWA Region 4 Area Engineer	Project Development/Oversight
Gary Fottrell Federal Highway Administration	FHWA Region 4 Environmental Program Engineer	Conducted FHWA reviews of the NEPA document and provided guidance throughout the NEPA process.
Thomas Love Tennessee Department of Transportation	TDOT Transportation Manager 1	Conducted TDOT reviews of the NEPA document and provided other guidance throughout the NEPA process.
Tammy Allison Sellers Tennessee Department of Transportation	TDOT Historic Preservation Supervisor	Prepared Historical/Architectural Assessment and Documentation of Effect Report.
Pamela Marshall Tennessee Department of Transportation	TDOT Community Relations Officer	Served as the Community Relations Lead for the public involvement efforts throughout the NEPA process. Helped identify stakeholders for the project.

APPENDIX A

INITIAL COORDINATION LETTERS and OTHER STAKEHOLDER COORDINATION LETTERS

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
167 NORTH MAIN STREET B-202
MEMPHIS, TENNESSEE 38103-1894

REPLY TO
ATTENTION OF:

March 8, 2007

Operations Division

Mr. Charles E. Bush
Tennessee Department of Transportation
Environmental Division
James K. Polk Building, Suite 900
505 Deaderick Street
Nashville, Tennessee 37243-0334

Dear Mr. Bush:

This is in response to your January 22, 2007, letter regarding an Environmental Impact Statement for the Interstate 55 Interchange EH Crump Boulevard and South Riverside Boulevard Improvement Project in Memphis, Shelby County, Tennessee.

As described in the materials you provided, our preliminary jurisdictional determination is that no wetlands or other waters of the United States are present within the project area and that no Department of the Army permits would be required for this project. Therefore, we must decline the offer to become a participating agency in this process because we have no jurisdiction over the project.

Our lack of jurisdiction notwithstanding, your letter also addresses the need for coordination regarding cultural resources within the project area. Based on a preliminary review by the District Archaeologist, it appears that the project area may be part of a prehistoric/historic/civil war site associated with the Chickasaw Bluffs; because this is a highly sensitive cultural area, additional surveys will likely be required.

If you have questions, please reference File No. MVM-2007-33-RSA and contact Roger Allan at the letterhead address or by telephone at (901) 544-3682.

Sincerely,

Larry Watson

Larry D. Watson
Chief
Regulatory Branch

FA-0332

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900 - JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243

Gerald Nicely
Commissioner

Phil Bredesen
Governor

January 22, 2007

No significant adverse impacts to wetlands or federally listed endangered or threatened species are anticipated from this proposal.

Lee Barclay 2/6/07
Field Supervisor Date
U.S. Fish & Wildlife Service
Cookeville, TN

Lee Barclay
U.S. Fish and Wildlife Service
446 Neal Street
Cookville, Tennessee 38501

SUBJECT: Interstate 55 (I-55) Interchange EH Crump Boulevard and South Riverside Boulevard Improvement Project Environmental Impact Statement, Memphis, Tennessee.

Dear Mr. Barclay,

The Tennessee Department of Transportation and the Federal Highway Administration are preparing an Environmental Impact Statement (EIS) for improvements to the Interstate 55 (I-55) Interchange at EH Crump Boulevard and South Riverside Boulevard near the western edge of the City of Memphis in Shelby County, Tennessee. The proposed project would involve reconfiguring the existing cloverleaf design of the I-55 Interchange at EH Crump Boulevard and South Riverside Boulevard, henceforth I-55 Interchange, into a configuration that reduces crashes, relieves congestion, and provides route continuity by eliminating the need for mainline traffic to utilize ramps. The two build alternatives proposed, Alternative A and Alternative B, utilize the same general design with variations in the arrangement of exits and secondary roads. A more detailed project description is contained in the attached Project Data Summary Sheet. Maps of the project area and proposed build alternatives are also included in the attached document. This material is intended to initiate the scoping process for the EIS.

We are presently in the early stages of planning for this improvement and need to know if the proposed project will have any effect, either favorable or adverse, on any programs being planned or executed by your agency/organization. We request that you review the enclosed material and advise us with your comments on potential environmental impacts. Areas of specific concern to your agency/organization will be addressed during the development of our environmental and location studies.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

February 26, 2007

Charles Bush
Transportation Manager II
Tennessee Department of Transportation
James K. Polk Building
505 Deaderick Street, Suite 900
Nashville, Tennessee 37243-0334

SUBJECT: Participating Agency Request for the Interstate 55 Interchange at EH Crump Boulevard and South Riverside Boulevard Improvement Project Environmental Impact Statement in Memphis, Shelby County, Tennessee

Dear Mr. Bush:

The U.S. Environmental Protection Agency (EPA) received your letter dated January 22, 2007, inviting EPA to become a "participating agency" with the Tennessee Department of Transportation (TDOT) and Federal Highway Administration (FHWA) in the development of the Environmental Impact Statement (EIS) for the improvement of the Interstate 55 (I-55) Interchange at EH Crump Boulevard and South Riverside Boulevard near the western edge of the City of Memphis in Shelby County, Tennessee. In accordance with this request, we accept your invitation to become a participating agency for this project and will endeavor to participate in project activities in the manner suggested in your letter. There is no mention in your letter if the project will be put through the new Tennessee Environmental Streamlining Agreement (TESA) process for major transportation projects in Tennessee. EPA supports the utilization of the TESA process for this project.

Your letter also requested EPA to provide comments on potential environmental impacts associated with the proposed action. In accordance with this request and based on the information provided, EPA offers the following comments related to issues that should be addressed and information that should be included in the Draft EIS for this project:

Future Projected Traffic

The Draft EIS should include a thorough analysis of future traffic conditions on the proposed facility, with a particular emphasis on estimating future truck traffic. The traffic analysis should identify the current percentage of truck traffic that utilizes the I-55 interchange at EH Crump Boulevard through Memphis and include an estimation of additional truck traffic or percentage of future traffic that will utilize the new facility. This information is critical for the purposes of completing air quality (see below) and noise impacts assessment and should be split out and reported directly.

Noise

EPA is concerned about substantial noise impacts to adjacent residential communities. Noise abatement should be considered when project noise impacts approach FHWA Noise Abatement Criteria or meet or exceed the existing noise levels by incremental increases of 10 dBA or greater. Forms of noise mitigation include -- but are not limited to -- the construction and use of fabricated noise barriers and vegetated earthen berms. Vegetative screens included as part of highway landscaping can also be useful to visually remove receptors from the project, but have to consist of a substantial width of dense evergreen vegetation to offer any real attenuation.

Air Quality – Transportation Conformity

The Memphis area, including Shelby County, is designated nonattainment for the 8-hour ozone standard effective June 2004. In addition, Shelby County is considered a maintenance area for carbon monoxide. Because the project is located in these nonattainment areas, a discussion of this area's status with regard to those standards should be included in the Draft EIS. In addition, it should be confirmed that the project is included in the most recent air quality conformity analysis for the Memphis 8-hour ozone nonattainment area.

Air Quality – Air Toxics

The Clean Air Act requires EPA to control hazardous air pollutants (or "air toxics") from mobile and stationary sources. EPA identified a group of 21 mobile source air toxics (MSATs), which are set forth in an EPA final rule, Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17235, March 29, 2001). Most recently, EPA has published another proposal to further control mobile source air toxics (71 FR 15804, March 29, 2006). In this proposal, EPA identifies seven MSATs of greatest concern because of their contribution to cancer and/or noncancer risk: benzene, 1,3-butadiene, formaldehyde, acrolein, polycyclic organic matter, naphthalene, and diesel exhaust (specifically, diesel particulate matter and diesel exhaust organic gases). There is heightened concern for human health from projects that result in air toxics emissions and particulate matter from mobile sources, particularly diesel exhaust. A large number of human epidemiology studies show increased lung cancer associated with diesel exhaust and significant potential for non-cancer health effects.

Consequently, EPA recommends that the Draft EIS disclose potential MSAT emission impacts resulting from each of the build alternatives (including construction activities) for purposes of comparison, including a discussion of the resulting cancer and non-cancer health effects associated with emissions of, at a minimum, benzene, 1,3-butadiene, formaldehyde, acrolein, and diesel exhaust (specifically, diesel particulate matter and diesel exhaust organic gases). If additional air toxics are associated with the project which may substantively impact the study area, they should be included in the analysis as well. The specific human populations to be assessed should include the general population as well as sensitive receptors such as schools, healthcare facilities (e.g., hospitals), elderly populations, and environmental justice communities. Both regional and near roadway impacts (typically within 200 meters of the project) should be considered, especially given the proximity of residential communities to the project area.

An example of such an analysis would include: (1) the disclosure of all locations at which exposures to sensitive receptors may increase because of construction, widening or moving roads and ramps, increased traffic, increased diesel traffic, or increased loads on engines; and (2) an assessment of the factors that could influence the degree of adverse impact on the population such as the amount of construction activity, proximity of construction to people, etc. Analytical approaches that would lead to an understanding of potential increases (or decreases) in exposures to these target populations will typically require the development of emissions inventories for the various build alternatives and may also require dispersion modeling. The overall analysis should assess the cumulative impact posed by the project in combination with exposures to chemicals that result from other sources which impact the study area. An EPA point of contact for additional information on conducting such an analysis is Mr. Ken Mitchell at (404) 562-9065 or mitchell.ken@epa.gov.

Environmental Justice

The project information identified the potential for environmental justice (EJ) concerns associated with impacts to the nearby French Fort neighborhood. The issue of disproportionately high and adverse impacts should be evaluated in the document by comparing environmental impact data to EJ information for each of the build alternatives. Adverse effects are defined as "disproportionate" if the risk of adverse environmental impacts are predominately borne in areas with minority or low-income populations or if the impacts are greater in magnitude in areas with minority or low-income populations than in other areas. The Draft EIS should identify areas with significant percentages of low-income and minority populations that would be affected by the build alternatives and determine the extent to which there would be significant differences between alternatives in impacts to these communities. When analyzing these impacts, it is important to assess both the negative and positive impacts, consider both the short and long-term effects, as well as the indirect and cumulative impacts. The current information presented focuses mainly on the potential for relocations of these persons. EPA is supportive of TDOT's attempts to find adequate, affordable replacement housing; however, the impact assessment should also look at other categories such as noise, air quality and economic impacts.

We appreciate the opportunity to work with TDOT as a participating agency on this important project. Please contact Ben West, as our primary agency representative for this project, at (404) 562-9643 to discuss this letter or if you have additional questions.

Sincerely,

Heinz J. Mueller, Chief
NEPA Program Office
Office of Policy and Management

cc: Federal Highway Administration – Tennessee Division

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
675 U.S. Courthouse
801 Broadway
Nashville, Tennessee 37203

January 29, 2007

Mr. Charles E. Bush
Tennessee Department of Transportation
Environmental Division
Suite 900 – James K. Polk Building
505 Deaderick Street
Nashville, Tennessee 37243

Dear Mr. Bush:

SUBJECT: EIS – IMPROVEMENTS TO THE INTERSTATE 55 (I-55) INTERCHANGE AT EH CRUMP BOULEVARD AND SOUTH RIVERSIDE BOULEVARD NEAR THE WESTERN EDGE OF THE CITY OF MEMPHIS IN SHELBY COUNTY, TENNESSEE

In regards to your proposal for reconfiguring the existing cloverleaf design of the I-55 Interchange at EH Crump Boulevard and South Riverside Boulevard, henceforth I-55 Interchange, NRCS renders a "No Effects" assessment for the detailed project description.

Thank you for the opportunity to comment at this time.

Sincerely,

DEENA M. WHEBY
Acting State Conservationist

cc:
Vic Simpson, SRC, NRCS, Nashville, TN

Helping People Help the Land

An Equal Opportunity Provider and Employer

U.S. Department of Homeland Security
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314)269-2380
Fax: (314)269-2737
Email: peter.j.sambor@uscg.mil

16591.1/I-55 Interchange
February 21, 2007

Mr. Charles Bush
Tennessee Department of Transportation
James K. Polk Building
505 Deaderick St, Ste 900
Nashville, TN 37243

Subj: INTERSTATE 55 INTERCHANGE AT E.H. CRUMP BOULEVARD

Dear Mr. Bush,

We have reviewed the information provided in your letter of January 22, 2007 and determined that this project is not a project over which the Coast Guard exercises jurisdiction for bridge administration purposes. A Coast Guard permit is not required.

If there are any questions, please contact Mr. Peter Sambor at the above extension. We appreciate the opportunity to comment on the project.

Sincerely,

ROGER K. WIEBUSCH
Bridge Administrator
By direction of the District Commander

United States Department of Agriculture

NRCS Natural Resources Conservation Service

USDA

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER SUPPLY
GROUND WATER MANAGEMENT SECTION
9th Floor, 401 Church Street
Nashville, Tennessee 37243-1539
Phone: (615) 532-0191; Fax: (615) 532-0503

February 13, 2007

Mr. Charles E. Bush
Environmental Division
Department of Transportation
Suite 900- James K Polk Building
505 Deaderick Street
Nashville, TN 37243-0334

RE: Interstate 55 (I-55) Interchange EH Crump Boulevard & South Riverside Improvement Project
Shelby County, TN

Dear Mr. Bush:

The Division of Water Supply appreciates the opportunity to provide water supply information in the furtherance of Department of Transportation projects. A review of the community water supplies in the Shelby County area show that the area of the improvement project is not in the vicinity of any of Memphis Light Gas and Water's wellfields or wellhead protection areas.

If you have any questions, feel free to call me at (615) 532-0170 or e-mail me at tom.moss@state.tn.us.

Sincerely,

Thomas A. Moss

Thomas A. Moss, P.G.
Source Water/Wellhead Protection Coordinator
Manager, Ground Water Management Section
Division of Water Supply

c: Robert Foster, Deputy Director, TN Division of Water Supply
Brian Caton, Jackson DWS Field Office Manager

STATE OF TENNESSEE
ECONOMIC & COMMUNITY DEVELOPMENT

BUSINESS DEVELOPMENT DIVISION

February 21, 2007

Mr. Charles E. Bush
TN Dept. of Transportation
Environmental Division
Suite 900, James K. Polk Bldg.
505 Deaderick Street
Nashville, TN 37243

SUBJECT: Interstate 55 (I-55) Interchange EH Crump Boulevard and South Riverside Boulevard Improvement project Environmental Impact Statement Memphis, Tennessee

Dear Mr. Bush:

The Tennessee Department of Economic & Community Development appreciates the opportunity to review the above referenced project and the invitation to become a participating agency in the development of the EIS for said project. While the department always encourages improvements to Tennessee's road network, we have no other specific comments on the project. Our Division of Local Planning has checked the proximity of the project to flood affected areas and found it to be removed from such. Therefore we respectfully decline the invitation to become a participating agency for the reasons that:

- This department has no jurisdictional authority with respect to the project;
- This department has no further expertise or information relevant to the project; and
- This department does not intend to submit further comments on the project.

Sincerely,

Wilton Burnett, Jr.

Wilton Burnett, Jr., P.E.
Director of Special Projects

312 EIGHTH AVENUE NORTH, ELEVENTH FLOOR
NASHVILLE, TENNESSEE 37243
TELEPHONE: 615.741.3282 — FAX: 615.741.5829
HTTP://WWW.TNECD.GOV

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
9th Floor L&C Annex, 401 Church Street
Nashville, Tennessee 37243-1531

February 21, 2007

Mr. Charles E. Bush
Department of Transportation
Environmental Division
Suite 900, James K. Polk Building
505 Deaderick Street
Nashville, TN 37243

Subject: Interstate 55 (I-55) Interchange with EH Crump Boulevard and South Riverside Boulevard Improvement Project Environmental Impact Statement, Memphis, Tennessee.

Dear Mr. Bush:

The Division of Air Pollution Control has reviewed your project summary for the proposed Interstate 55 Interchange at Crump Boulevard, Memphis, Tennessee. This project is in a Carbon Monoxide and Ozone Maintenance area and is therefore subject to Chapter 1200-3-34, Transportation Conformity. If not already contained in the Memphis Metropolitan Planning Organization's latest approved Long Range Transportation Plan, the project would have to be added to meet the Transportation Conformity Requirements.

This agency's other interest, above what would be addressed through the standard NEPA process, concerns the control of fugitive dust and equipment exhaust emissions during the construction phase, and the assurance that any structures requiring demolition are asbestos free, as per the requirements of Chapter 1200-3-11, Hazardous Materials. Before burning any wood waste, please refer to Chapter 1200-3-4; Open Burning Certification Process at http://state.tn.us/environment/apc/apcregs/.

This project is located in Shelby County, which has a local air program. The local air program may wish to review this document as well. In case they did not receive a copy, they can be reached at (901) 544-7787.

We appreciate the chance to comment on this, and we would also appreciate the chance to review the Environmental Impact Statement when it becomes available.

If you have any questions or comments, please feel free to call me at (615) 532-0554.

Sincerely,

Barry R. Stephens, P.E.
Director

cc: Robin Cathcart

I-55 Interchange at EH Crump Boulevard
2/21/2007
Page 2

TENNESSEE WILDLIFE RESOURCES AGENCY

ELLINGTON AGRICULTURAL CENTER
P. O. BOX 40747
NASHVILLE, TENNESSEE 37204

March 6, 2007

Charles Bush
State of Tennessee
Department of Transportation
Environmental Division
Suite 900, James K. Polk Building
505 Deaderick Street
Nashville, TN 37243-0334

Re: Initial EIS Scoping Coordination – Interstate 55 (I-55) Interchange EH Crump Boulevard and South Riverside Boulevard Improvement Project Environmental Impact Statement, Memphis, Tennessee.

Dear Mr. Bush:

The Tennessee Wildlife Resource Agency has received (on January 25, 2007) and reviewed the information your office provided to us regarding the proposed project listed above. We currently have little concern regarding potential stream and wetland impacts that may occur due to the construction of this project. We accept the invitation to participate in this process and encourage continued consultation with our agency in future phases of this project to reduce impacts to fish and wildlife resources.

We thank you for the opportunity to comment during the initial EIS scoping coordination process and look forward to working with TDOT personnel in the future to reduce potential impacts to fish and wildlife resources associated with this project.

Sincerely,

Robert M. Todd

Robert M. Todd
Fish and Wildlife Environmentalist

cc: Steve Seymour, Region I Habitat Biologist
Jerry Strom, Region I Assistant Manager
Lee Barclay, U.S. Fish and Wildlife Service
Darryl Williams, Environmental Protection Agency

January 29, 2007

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

Mr. Charles Bush
Tennessee Dept. of Transportation
Suite 700/J. K. Polk Bldg.
Nashville, Tennessee, 37243-0349

RE: FHWA, I-55 INTERCHANGE/EH CRUMP BLVD., MEMPHIS, SHELBY COUNTY

Dear Mr. Bush:

In response to your request, received on Thursday, January 25, 2007, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800. You may wish to familiarize yourself with these procedures (Federal Register, December 12, 2000, pages 77698-77739) if you are unsure about the Section 106 process.

Considering available information, we find that the project as currently proposed MAY AFFECT PROPERTIES THAT ARE ELIGIBLE FOR LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES. You should continue consultation with our office, designated consulting parties and invite them to participate in consultation, and provide us with appropriate survey documentation for review and comment. Please direct questions and comments to Joe Garrison (615) 532-1550-103. We appreciate your cooperation.

Sincerely,

Richard G. Tune
Interim Executive Director and
Deputy State Historic
Preservation Officer

RGT/jyg

City of Memphis
TENNESSEE

DR. WILLIE W. HERENTON - Mayor
KEITH L. McGEE - Chief Administrative Officer
DIVISION OF ENGINEERING
WAIN GASKINS - City Engineer

February 1, 2007

Mr. Charles Bush
Transportation Manager II
Tennessee Dept. of Transportation
James K. Polk Bldg, Suite 900
Nashville, Tennessee 37243

Re: Interstate 55 (I-55) Interchange EH Crump Boulevard and South Riverside Boulevard Improvement Project EIS, Memphis, TN

Dear Mr. Bush:

We are in receipt of your letter dated January 22, 2007 on the above referenced project. The City is very supportive of this project and in agreement with the two proposed build alternatives. We are available to assist your department in the completion of the environmental document, as required.

To my knowledge, the only special interest group in the area that has not been a part of the previous meetings is the Cherokee Nation. Ms. Sara Lewis, neighborhood resident and City of Memphis employee, will provide some information on that group. Since this is an interstate project that serves the region, there is always the possibility there may be some special interest groups that would voice concern or opposition at some point in the process.

The informational newsletter that has been developed is a good tool to publicize this interchange modification project and should alert any group that may have an interest in the project that has not previously been identified.

If we can be of additional assistance, please do not hesitate to contact us.

Very truly yours,

Wain Gaskins,
City Engineer

Room 644 • 125 North Main Street • Memphis, Tennessee 38103-2017 • (901) 576-6700 • FAX (901) 576-6960

American Commercial Lines
1701 East Market Street, Jeffersonville IN 47130-4717

March 8, 2007

State of Tennessee
Department of Transportation
Environmental Division
Suite 900 – James K. Polk Building
505 Deaderick Street
Nashville, Tennessee 37243

RE: Interstate 55 (I-55) Interchange EH Crump Boulevard and South Riverside Drive Improvement Project Environmental Impact Statement, Memphis, Tennessee

Dear Sir,

ACL Transportation Services ("ACL TS") is a bulk liquid storage facility located at 427 W. Illinois Avenue, Memphis, Tennessee. This facility is located at the western most portion of the City of Memphis. Desoto Park bounds the east of the facility, while the Mississippi River bounds the west of the facility. Illinois Avenue the only access to the facility.

ACL TS handles a variety of non-hazardous, bulk liquid products in above ground tanks. These products are transported to the facility by the Mississippi River and over the road by commercial trucks. Truck activity may reach thirty (30) to forty (40) semi truck loads per day between the hours of 6:00 AM to 4:00 PM.

Currently access to ACL TS is via the West bound exit at Crump Boulevard/I-55 North onto the Metal Museum Drive exit and turning right on Illinois Avenue. Southbound I-55 traffic can also gain access to Illinois Avenue via the current Metal Museum Drive exit ramp. An auxiliary route is available by exiting off of I-55 South onto McLemore Avenue to gain access to Illinois Avenue. McClemore leads to President's Island. However, this route is unavailable for commercial truck traffic, as commercial truck traffic is impermissible around Desoto park, under current Memphis traffic laws. The introduction of any additional truck traffic to this exit will greatly increase congestion on the already heavily trafficked McClemore Avenue and create a potentially unsafe traffic zone. Because of railroad access to the island, traffic is halted during railroad usage. Trains crossing at the junction of McClemore and the Jack Carley Causeway (the main road to the island) prevent all traffic from entering or leaving the area.

ACL Transportation Services LLC
427 W. Illinois Avenue
Memphis, Tennessee 38106

Making this proposed change to the I-55 interchange is greatly needed as numerous vehicle casualties have resulted due to the increased traffic and poor access to the next leg of the interstate. However, ACL TS's business and revenue is dependent upon the product transport by truck. Because of the facility's size and river access location, it is neither economically feasible nor practical to relocate the whole of the facility. Safe and unimpeded access to and from our facility and our neighboring businesses is essential for our continued operations and continued success within the City of Memphis.

Given the two options, Alternative A is preferred because Alternative B does not include any direct access to Illinois Avenue and would cause severe business interruption to ACL TS. In the event Alternative B is chosen, access our facility will greatly impact the residents of the French Fort neighborhood, including potential property devaluation, from the increased presence of commercial truck traffic.

We appreciate this opportunity to respond to the proposed changes and if you are unable to grant the requested relief based upon the information contained herein, ACL TS's requests that a hearing be held on this matter at a mutually agreeable date and time.

Respectfully,

Stephen G. Banet
Facility Superintendent

ACL Transportation Services LLC
427 W. Illinois Avenue
Memphis, Tennessee 38106

I-55 Crump

Dear Mr. Bush, 2/28/07

I am the managing partner and fifty percent owner of Desoto Pointe Partners. The partnership owns two pieces of property in the French Fort area. One is the old U.S. Marine Hospital which lies on 3.17 acres and the other is the former Quality Inn property which lies on 2.69 acres. Our plans are to convert the three existing buildings on the Hospital property to thirty-three condominiums and to construct seven new town homes at a cost of $16M upwards. Further we propose to construct on the Quality Inn property an apartment complex of up to eighty five units at a cost of $10m upwards and also renovate the existing building at a cost of approximately $6M for Hotel, Apartments, commercial or etc. This will rid the area of a considerable amount of blight and certainly will be the catalyst for further revitalization of the area.

I am opposed to Alternative "B" and believe that Alternative "A" is best for the community and the city of Memphis. It is hard for me to believe that in this day and time that serious consideration would be given to an alternative road system that would further disconnect a community from the downtown core. Across this country there is a strong movement towards New Urbanism and revitalization of major cities has occurred or is underway. Government dollars and incentives have encouraged developers to utilize current existing infrastructure rather than building new for the obvious reasons. Many cities *(see Hoyt St. Attached)* are trying to reattach certain areas which have been cut off by Interstate systems and the like.

If there is a concern of traffic in the neighborhood, beyond the fact that "A" would make it less desirable to cut thru; rather than go to "B" I think traffic can be impeded or discouraged by a few changes such as speed bumps, median strips on wider roads, signage and etc.

Alternate "A" would reconnect the area to the downtown core. I suggest a side walk from Illinois Ave. to Georgia Ave. In the future under "A" there might be some possibility of alternate transportation system to and from downtown but with "B" I think it is much less likely.

Regards,

Lauren T. Crews

2285 Lamisgwood Dr
Germantown, TN
38139

Lauren T. Crews
Real Estate Investments

office 901-309-1118
email laurencrews@bellsouth.net
mobile 901-262-2877
fax 901-309-1803

MAR. 7. 2007 4:47PM SOUTHERN GINNERS NO. 5062 P. 1/3

Southern Cotton Ginners Association

874 Cotton Gin Place, Memphis, TN 38106
Phone (901) 947-3104 ~ Fax (901) 947-3103
www.southerncottonginners.org

FAX TRANSMITTAL **# of Pages: 3**

To: Luke Eggering **Date: March 7, 2007**

Fax: 314-576-2702

From: Tim Price, Executive Vice President
tim.price@southerncottonginners.org

We have just completed our Board meeting discussing this topic. Thanks for considering our concerns and interest in this project.

MAR. 7. 2007 4:47PM SOUTHERN GINNERS NO. 5062 P. 2/3

Southern Cotton Ginners Association
874 Cotton Gin Place Memphis, TN 38106
Phone: 901.947.3104 Fax: 901.947.3103
www.southerncottonginners.org

March 7, 2007

To: Charles E. Bush
Transportation Manager
Department of Transportation
State of Tennessee

From: Timothy L. Price
Executive Vice President
Southern Cotton Ginners Association
874 Cotton Gin Place
Memphis, TN 38106

Re: I-55 Interchange, E.H. Crump Boulevard and South Riverside Boulevard Improvement Project, EIS

The Southern Cotton Ginners Association is a trade association that serves members in the five states of Arkansas, Louisiana, Mississippi, Missouri and Tennessee by providing safety, training, and regulatory representation. The organization also sponsors certification programs and hosts the industry's leading trade show, The Mid-South Farm and Gin Show.

On March 1, 2007, the Executive Committee and Board of Directors met and were apprised of the current proposals sent in your letter of January 22, 2007. We certainly appreciate the opportunity to have input and comment on both proposals. We were original property owners in this location and have had this as our headquarters location since 1967.

This location has served us well in terms of location and functionality all these years. It has provided easy access to our members from the five state area and has allowed us to have storage and accessibility to putting on our trade show, the Mid South Farm and Gin Show. We have just completed our 55th show which brings in 15-20,000 people over two days to see exhibits from 48 states and 6 foreign countries. This current location has served us well.

MAR. 7. 2007 4:48PM SOUTHERN GINNERS NO. 5062 P. 3/3

As our Executive Committee and Board reviewed both options there were several points made that, based on current information, are of concern to us.

1. Both option A and B will significantly impact the current functionality of our Association and its future plans.
2. The French Fort community and surrounding areas have been excellent neighbors for many years and we respect their neighborhood and business concerns.
3. Option A seems to clearly eliminate our building and if so, further considerations and discussions may be irrelevant. We, of course, would have to relocate and would want fair compensation.
4. Option B would not, by this current assessment, eliminate our building. However, in effect, it would dramatically reduce our current functionality. Our members from 2 of 5 states and numerous exhibitors and customers would not have a ready and easy access from the west of the I-55 bridge. Additionally, we have enjoyed access from Alston Street to the rear of our building for loading supplies and stored equipment. This access has long been granted by the Mississippi RV Park ownership and management.
5. After our initial building was constructed, the property adjacent was sold to the Mississippi River RV Park. Their building is attached to our original building and thus any alteration to their facility would likely render our building virtually useless and could not be done without permanent damage.
6. We have no further need for expansion or additional space requirement but the current functionality we have is critical to our continuing operation.
7. In conclusion, it is our initial opinion that both options A and B, for different reasons, will render our current building location and functionality very significantly damaged if not useless.

There is, no doubt, of the need for this improvement from a transportation efficiency and safety standpoint. Our business, beyond our office location concerns, is dependent upon efficient and safe transportation and a change to this interchange is long overdue.

We respectively request your consideration of these comments and look forward to being a part of a successful outcome for all.

Presidents Island Industrial Association, Inc.

07/15/08

Steve Chipman
TDOT Project Manager

Re: I55 / Crump Blvd

Steve:

Thank you, Pamela and Luke, for speaking at our Association Luncheon. We also appreciate your follow up inquiries with the Traffic Engineer about the warning at the Mallory area.

I expect there may be a need for more meetings with TDOT and the association over the next few years before this work begins.

Our main issue is that access to and from President's Island from Crump at the Bridge should not be restricted any more that it is now. All involved must consider the necessity of EMERGENCY EVACUATION routes from Presidents Island and this Crump access needs to flow as freely as possible.

Also trains sometimes block the main Island entrance. Routes to the North of the Causeway / Riverside intersection must remain an exit option.

We look forward to discussing these issues in detail with you and the Planners in the near future.

I have copied this correspondence to the PIIA board and the Port Commission. You now have contact E-mail addresses. Please consider us as "Stakeholders" for this project and advise us of any presentation, meeting or event that we can attend during all planning phases.

We are also able to distribute any pertinent information to the Association that you might have.

Please contact me if you have any questions or information.

Respectfully,
Jim Stafford Jr
President

APPENDIX B

CULTURAL RESOURCES COORDINATION LETTERS

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

March 31, 2006

Ms. Martha Carver
Tennessee Department of Transportation
505 Deaderick St/900
Nashville, Tennessee, 37243-0349

RE: FHWA, EFFECT DETERMINATION, I-55 INTERCHANGE IMPVTS/CRUMP BLVD, MEMPHIS, SHELBY COUNTY

Dear Ms. Carver:

Pursuant to your request, received on Thursday, March 23, 2006, this office has reviewed documentation concerning the above-referenced undertaking. This review is a requirement of Section 106 of the National Historic Preservation Act for compliance by the participating federal agency or applicant for federal assistance. Procedures for implementing Section 106 of the Act are codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739)

Based on the information provided, we find that the project area contains several cultural resources eligible for listing in the National Register of Historic Places: Memphis-Arkansas Bridge, U. S. Marine Hospital Executive Building & Laundry, Chickasaw Heritage Park, and W. T. Rawleigh/United Warehouse. We further find that the project as currently proposed will not adversely affect these resources.

Unless project plans change, this office has no objection to the implementation of this project. Should project plans change, please contact this office to determine what additional action, if any, is necessary. Questions and comments may be directed to Joe Garrison (615) 532-1550-103. Your cooperation is appreciated.

Sincerely,

Herbert L. Harper
Executive Director and
Deputy State Historic
Preservation Officer

HLH/jyg

January 29, 2007

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

Mr. Charles Bush
Tennessee Dept. of Transportation
Suite 700/J. K. Polk Bldg.
Nashville, Tennessee, 37243-0349

RE: FHWA, I-55 INTERCHANGE/EH CRUMP BLVD., MEMPHIS, SHELBY COUNTY

Dear Mr. Bush:

In response to your request, received on Thursday, January 25, 2007, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800. You may wish to familiarize yourself with these procedures (Federal Register, December 12, 2000, pages 77698-77739) if you are unsure about the Section 106 process.

Considering available information, we find that the project as currently proposed MAY AFFECT PROPERTIES THAT ARE ELIGIBLE FOR LISTING IN THE NATIONAL REGISTER OF HISTORIC PLACES. You should continue consultation with our office, designated consulting parties and invite them to participate in consultation, and provide us with appropriate survey documentation for review and comment. Please direct questions and comments to Joe Garrison (615) 532-1550-103. We appreciate your cooperation.

Sincerely,

Richard G. Tune
Interim Executive Director and
Deputy State Historic
Preservation Officer

RGT/jyg

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

June 9, 2008

Mr. Gerald Kline
Tennessee Department of Transportation
Environmental Planning and Permits Division
Suite 900, James K. Polk Building
505 Deaderick Street
Nashville, Tennessee 37243-0334

RE: FHWA, PHASE I ARCHAEOLOGICAL ASSESSMENT, I-55 AT E.H. CRUMP AND S RIVERSIDE, MEMPHIS, SHELBY COUNTY,

Dear Mr. Kline:

At your request, our office has reviewed the above-referenced archaeological survey report in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). Based on the information provided, we concur that the project area contains archaeological resources potentially eligible for listing in the National Register of Historic Places. Archaeological site 40SY109 should be avoided by all ground-disturbing activities or subjected to Phase II archaeological testing.

Upon receipt of the Phase II testing report or avoidance strategy, we will complete our review of this undertaking as expeditiously as possible. Please submit a minimum of two copies of each final report to this office in accordance with the Tennessee Historical Commission Review and Compliance Section Reporting Standards and Guidelines. Complete and/or updated Tennessee Site Survey Forms should be submitted to the Tennessee Division of Archaeology. Until such time as this office has rendered a final comment on this project, your Section 106 obligation under federal law has not been met. Please inform this office if this project is canceled or not funded by the federal agency. Questions and comments may be directed to Jennifer M. Barnett (615) 741-1588, ext. 105.

Your cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb

APPENDIX C

LIST OF DRAFT ENVIROMENTAL IMPACT STATEMENT RECIPIENTS

C.0 RECIPIENTS OF DRAFT ENVIRONMENTAL IMPACT STATEMENT

C.1 List of Recipients to Receive Copies of the Draft Environmental Impact Statement for Review

Copies of the DEIS were distributed to the agencies, public officials, individuals, tribes, and public facilities listed in Table C-1 to encourage review and comment on the document. The entire DEIS document was also made available for electronic viewing or downloading on the project website at: http://www.tdot.state.tn.us/i55/default.htm .

Table C-1. List of Recipients that Received Copies of the Interstate 55 Interchange DEIS for Review.

AGENCY TYPE	NAME	NUMBER OF COPIES SENT
Federal	U.S. Department of the Interior Office of Environmental Policy and Compliance	12
Federal	U.S. Department of Defense U.S. Army Corps of Engineers-Memphis District Regulatory Branch	2
Federal	Department of Housing and Urban Development	1
Federal	U.S. Department of Commerce National Oceanic and Atmospheric Administration	1
Federal	U.S. Coast Guard Eighth Coast Guard District	1
Federal	Federal Railroad Administration Office of Economic Analysis	1
Federal	Environmental Protection Agency Environmental Assessment Office	5
Federal	Environmental Protection Agency Office of Federal Activities	5
Federal	Advisory Council on Historic Preservation	5
Federal	Federal Aviation Administration	1
Federal	Federal Emergency Management Agency	
Federal	Federal Energy Regulatory Commission	1
State	Tennessee Department of Economic & Community Develop. NEPA Contact	1
State	Tennessee Department of Environment & Conservation Division of Air Pollution Control	1
State	Tennessee Department of Environment & Conservation Division of Ground Water Protection	1
State	Tennessee Department of Environment & Conservation Division of Natural Areas	1
State	Tennessee Department of Environment & Conservation Division of Solid and Hazardous Waste Management	1
	Tennessee Department of Environment & Conservation Division of Remediation	1
State	Tennessee Department of Environment & Conservation Division of Water Pollution Control	1

Table C-1. List of Recipients that Received Copies of the Interstate 55 Interchange DEIS for Review.

AGENCY TYPE	NAME	NUMBER OF COPIES SENT
State	Tennessee Department of Environment & Conservation Division of Water Supply	1
State	Tennessee Department of Environment & Conservation Commissioner	1
State	Tennessee Department of Environment & Conservation Tennessee Historical Commission	2
State	Tennessee Wildlife Resources Agency NEPA Contact	4
State	Tennessee Housing Development Agency	1
Local	Memphis and Shelby County Office of Planning and Development Transportation Coordinator	1
Local	Memphis Area Association of Government	1
Local	Mississippi-Arkansas Council of Governments	1
Local	Mr. A.C. Wharton Mayor of Shelby County, Tennessee	1
Local	Mr. Willie W. Herenton Mayor of Memphis	1
Local	Memphis Area Association of Governments	1
Local	Tennessee State Library and Archives	2
Local	Memphis-Shelby County Public Library and Information Center	2
Local	University of Memphis Library Government Publication Department	2
Private	French Fort Community Organization	1
Private	Southern Cotton Ginners Association	1
Private	World Wildlife Fund	1
Private	Tennessee Trails Association	1
Private	Tennessee Chapter of the Sierra Club	1
Private	Tennessee Environmental Council	1
Private	The Nature Conservancy	1
Tribe/Group Representative	Muscogee (Creek) Nation	1

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