

Programmatic Categorical Exclusion

Interstate 24 (I-24)

Bridges at Germantown Road, Log Mile (LM) 12.08 and Belvoir Avenue, LM 12.59

East Ridge

Hamilton County

PIN 124069.00

Submitted Pursuant to the National Environmental Policy Act of 1969, 42 U.S.C. 4332(2)

Project Information

General Information

Route: Interstate 24 (I-24)
Termini: Bridges at Germantown Road, Log Mile (LM) 12.08 and Belvoir Avenue, LM 12.59
Municipality: East Ridge
County: Hamilton
PIN: 124069.00
Plans: Transportation Investment Report (TIR)
Date of Plans: 07/10/2018

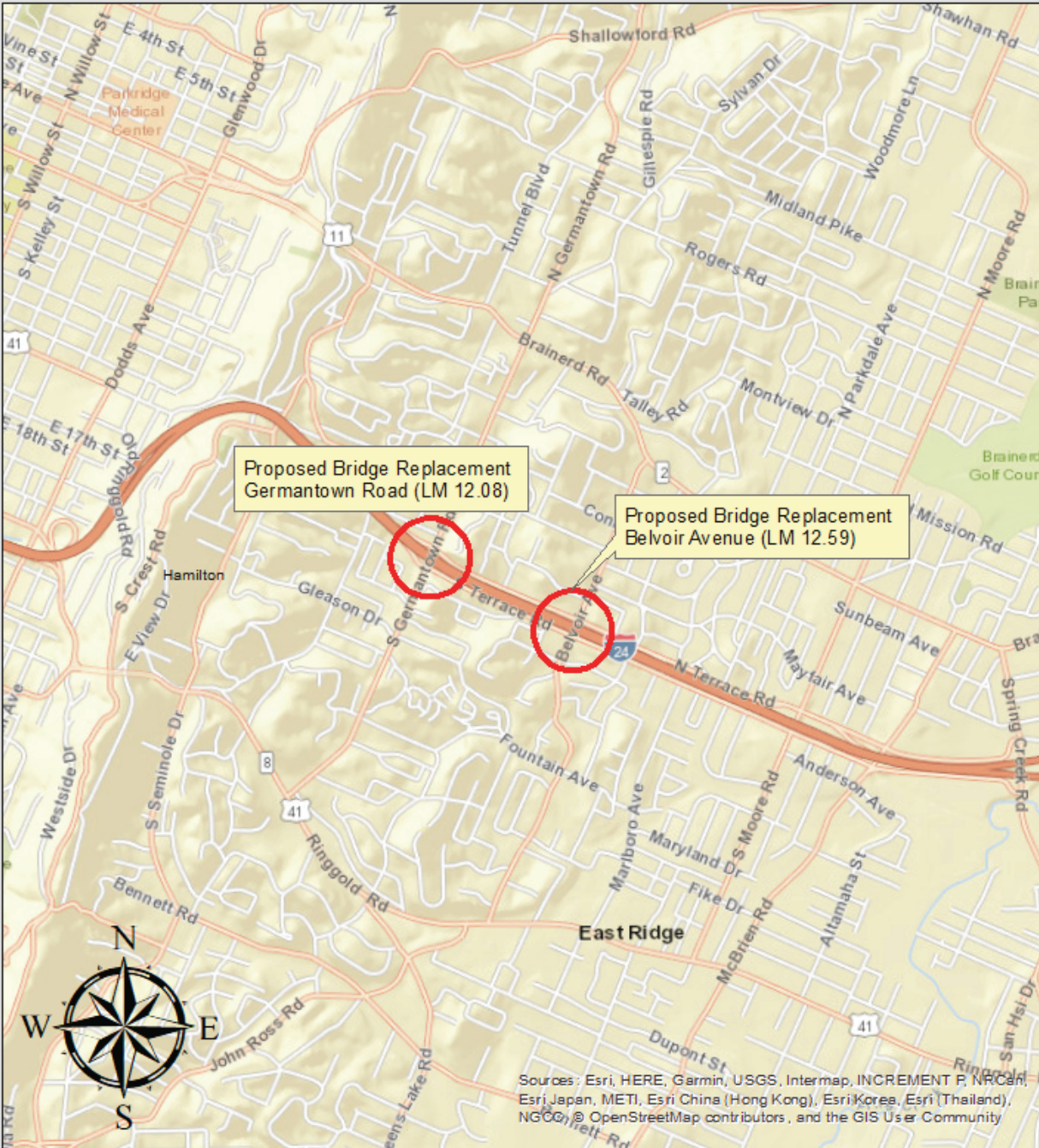
Project Funding

Planning Area: Chattanooga Hamilton County/North Georgia Transportation Planning Org (CHC/NGTPO)
STIP/TIP: Chatt 33100

Funding Source	Preliminary Engineering	Right-of-Way	Construction
Federal	BR-I-24-3(97)	BR-I-24-3(97)	BR-I-24-3(97)
State	(PE-N) 33003-0166-44 (PE-D) 33003-1166-44	33003-2166-44	33003-3166-44 33003-3167-44

Project Location

Project Location Map Interstate (I) 24 Bridges at Germantown Road, LM 12.08 and Belvoir Avenue, 12.59 in East Ridge Hamilton County PIN 124069.00



Project Overview

Introduction

The Tennessee Department of Transportation (TDOT), in coordination with the Federal Highway Administration (FHWA), is proposing to replace the Interstate 24 (I-24) bridge over Germantown Road, at Log Mile (LM) 12.08, and the Belvoir Avenue bridge over I-24, at LM 12.59 in the City of East Ridge, Hamilton County.

Background

Every two years, TDOT performs a comprehensive inspection and subsequent evaluation of all public bridges across the state in order to determine the status of their working condition and operating limits to ensure that they are in accordance with the FHWA's National Bridge Inspection Standards (NBIS). These inspections are recorded and published in the National Bridge Inventory (NBI) Tennessee Inventory and Appraisal Report. One of the components of this evaluation is the designation of a sufficiency rating. A sufficiency rating is calculated for each individual bridge that is used to carry vehicular traffic. Ratings are measured on a scale of 0 to 100. A rating of 100 corresponds to a bridge that qualifies as an "entirely sufficient bridge," while a rating of 0 denotes a bridge that is "entirely deficient." Bridges that receive a sufficiency rating of less than 80.0 are eligible for rehabilitation. Another component of the NBI are the condition ratings. Condition ratings are used to describe the existing, in-place bridge as compared to the as-built condition. The physical condition of the deck, superstructure, and substructure components of a bridge are evaluated for a condition rating. Condition ratings are assigned codes ranging from 0-9, with 0 being failed condition and 9 being excellent condition.

According to the NBI, Tennessee Inventory and Appraisal Report published on 7/30/2018 (located in the Technical Appendices), the I-24 bridge over Germantown Road at LM 12.08, received a 81.2 sufficiency rating. The superstructure received a condition rating of 6 (satisfactory, some minor deterioration). The deck and substructure received a condition rating of 4 (poor condition, advanced section loss, deterioration, spalling, or scour).

A Bridge Maintenance Recommendation packet was developed and revised on 8/29/2017 for the I-24 bridge over Germantown Road after a concerned citizen called about the structure. Loose delams were found and removed at this time. According to the Special Inspection Report completed with this request, the overall conditional rating of the subject bridge was categorized as poor. The report noted cracks under the bearings, loss of bearing area, and pothole on wearing surface near a honeycomb section surrounding what appears to be a test bore hole.

According to the NBI, Tennessee Inventory and Appraisal Report published on 7/30/2018 (located in the Technical Appendices), the Belvoir Avenue bridge over I-24 at LM 12.59, received a 86.6 sufficiency rating. The superstructure received a condition rating of 6 (satisfactory, some minor deterioration). The deck received a condition rating of 7 (good condition, some minor problems). The substructure received a condition rating of 8 (fair condition, all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour).

A Bridge Maintenance Recommendation packet was developed and revised on 10/6/2016 for the Belvoir Avenue bridge over I-24. According to the Bridge Maintenance Recommendation packet, the general condition of the subject bridge was categorized as fair. The report further assigns a fair rating to the pavement and bent caps, and a poor rating to the joint leakage on deck and the asphalt at all joints.

During the development of this document, a Transportation Investment Report (TIR) dated 7/10/2018 was approved for the subject project. The proposed technical study area did not show any changes to that sent to the technical studies areas, therefore, technical studies were not re-initiated. The information provided in the TIR will be incorporated into this document.

Project Development

Need

The proposed project is needed in order to address deficiencies due to the deterioration of the deck and substructure on the I-24 bridge over Germantown Road and the deterioration of pavement, bent caps, joint leakage on deck, and asphalt at all joints.

Purpose

The purpose of the proposed project is to provide general maintenance along the bridges and to bring the bridge's sufficiency ratings within TDOT standards by implementing bridge replacement.

Range of Alternatives

Other than the selected design, were any alternative build designs developed for this project? **Yes**

No-Build	In the development of design solutions that address the needs outlined above and achieve the purpose of the project, TDOT evaluated the potential consequences should the project not be implemented. This option, known as the No-Build alternative, assumed the continuation of current conditions and set the baseline from which the impacts of the selected design were compared.
Alternative Baseline	Germantown Bridge: Option 1 for the Germantown Road bridge over I-24 is the Baseline option. This alternative is for a concrete bridge constructed using traditional construction methods.
Build Alternative Belvoir	Belvoir Bridge: This option is the only alternative for the Belvoir bridge. The proposed bridge replacement for Belvoir Ave will be built using traditional construction techniques.
Alternative 1	Germantown Bridge: The second alternative for the proposed bridge replacement of the I-24 bridge over Germantown Road will be a concrete bridge using the accelerated bridge construction (ABC) method.
Alternative 2	Germantown Bridge: The last alternative for the I-24 bridge replacement over Germantown Road will utilities the ABC method,lateral slide, to construct the proposed steel bridge.
Alternative 3	Germantown Bridge: The last alternative for the I-24 bridge replacement over Germantown Road will utilities the ABC method, self propelled modular transporters (SPMT), to construct the proposed steel bridge.

Public Involvement

Has there been any public involvement for the project? **No**

Project Design

Existing Conditions and Layout

Based on the Enhanced Tennessee Roadway Information Management System (E-TRIMS), I-24 at the bridge location consists of an urban interstate roadway with a posted speed of 55 miles-per-hour (MPH). E-TRIMS categorizes this structure as two separate bridges which each serving one-way traffic (eastbound and westbound). These bridges however, are connected with a single overlay and the Tennessee Inventory and Appraisal Report identifies this structure as a single bridge. The I-24 bridge over Germantown Road, as defined as a single bridge, is a 4-span concrete cast-in-place bridge with three 12-foot travel lanes, an 8-foot inside shoulder, and a 3-foot outside shoulder in each direction (see Figures 2 to 4). Eastbound and Westbound traffic are separated with curb and gutter on either side of a concrete barrier. The bridge's out to out width is 100-foot, 3-inches with a length of 166 feet (Figure 3).

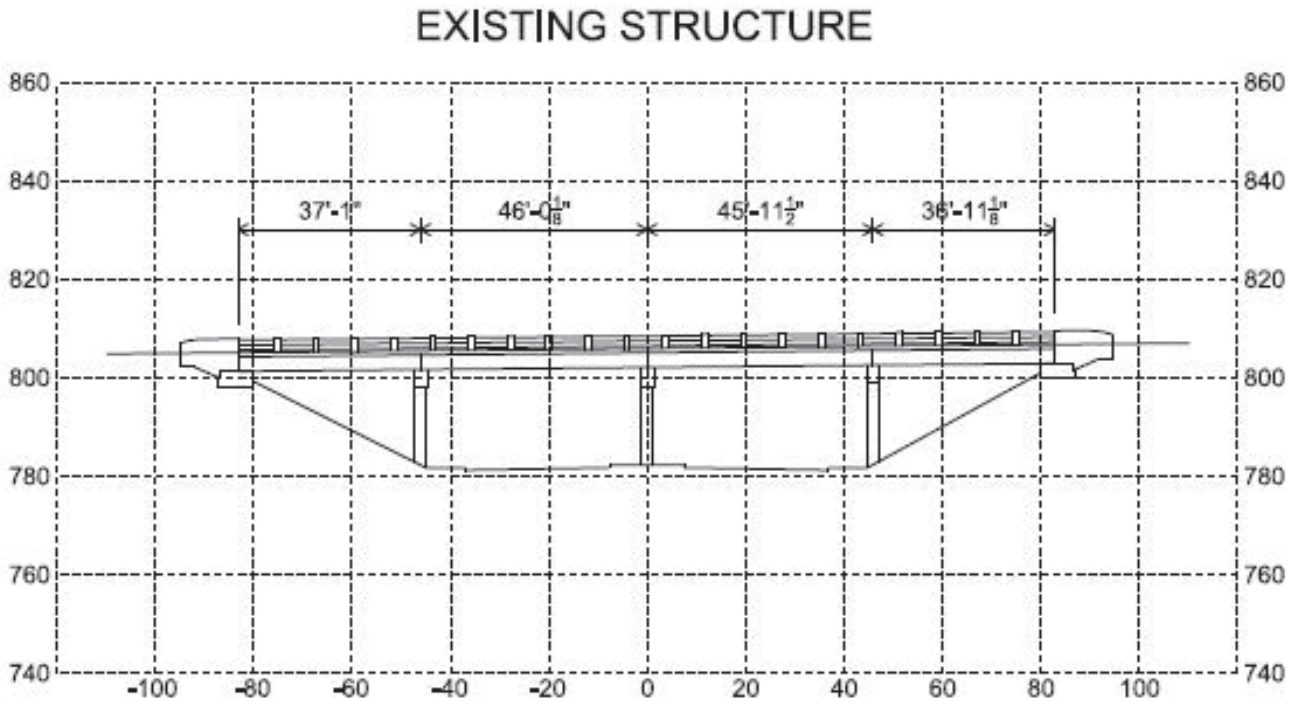


Figure 2: I-24 Bridge over Germantown Road showing existing span length

EXISTING STRUCTURE

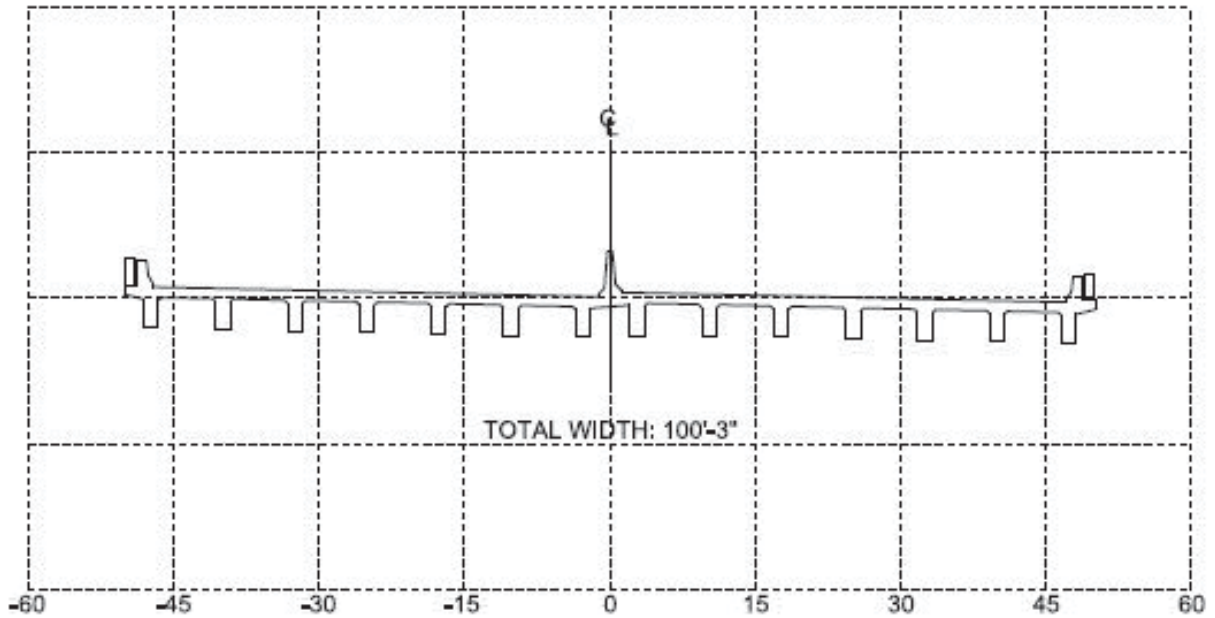


Figure 3: I-24 Bridge over Germantown Road showing existing width

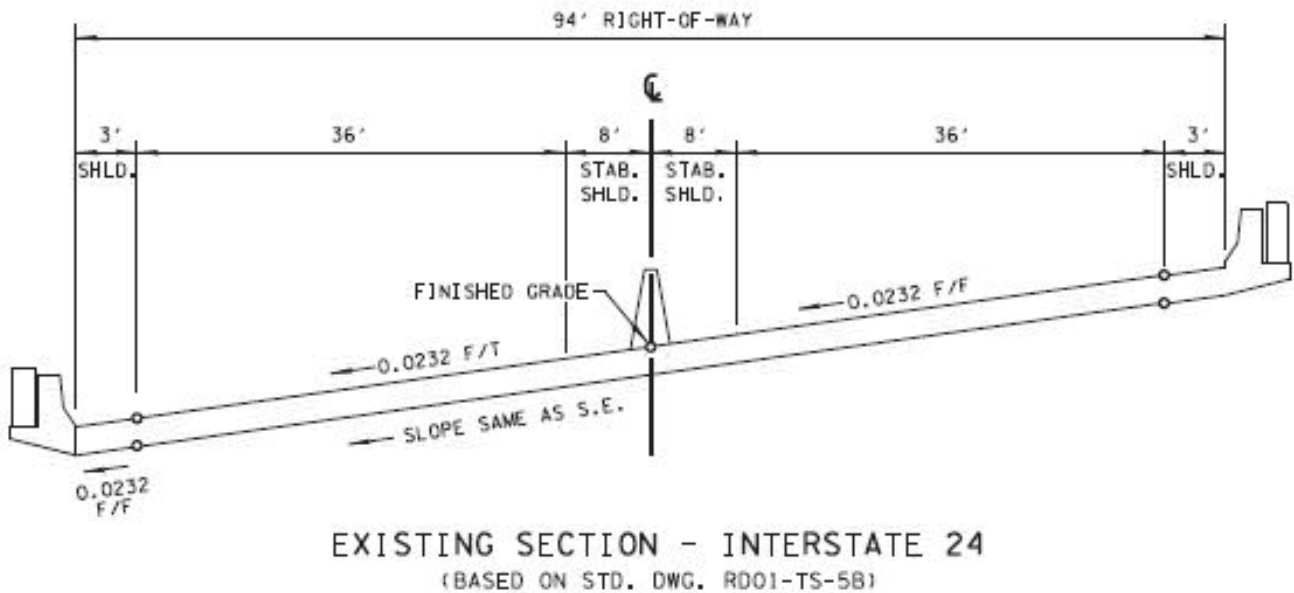


Figure 4: Existing Typical Section for I-24 Bridge over Germantown Road

The I-24 exit ramp onto Germantown Road (Exit 183) consist of two approximate 8-foot one-way exiting travel lanes with an approximate 10-foot shoulder to the south, and an approximate 5-foot shoulder to the north.

Based on the TIR and the Enhanced Tennessee Roadway Information Management System (E-TRIMS), the

Belvoir bridge is a 4-span concrete bridge with four 12-foot travel lanes (two in each direction), 10-foot shoulders and 5-foot sidewalks on each side (Figures 5 and 6). The bridge's out-to-out width is 79.4 feet with a length of 190.9 feet.

EXISTING STRUCTURE (OUTLET)

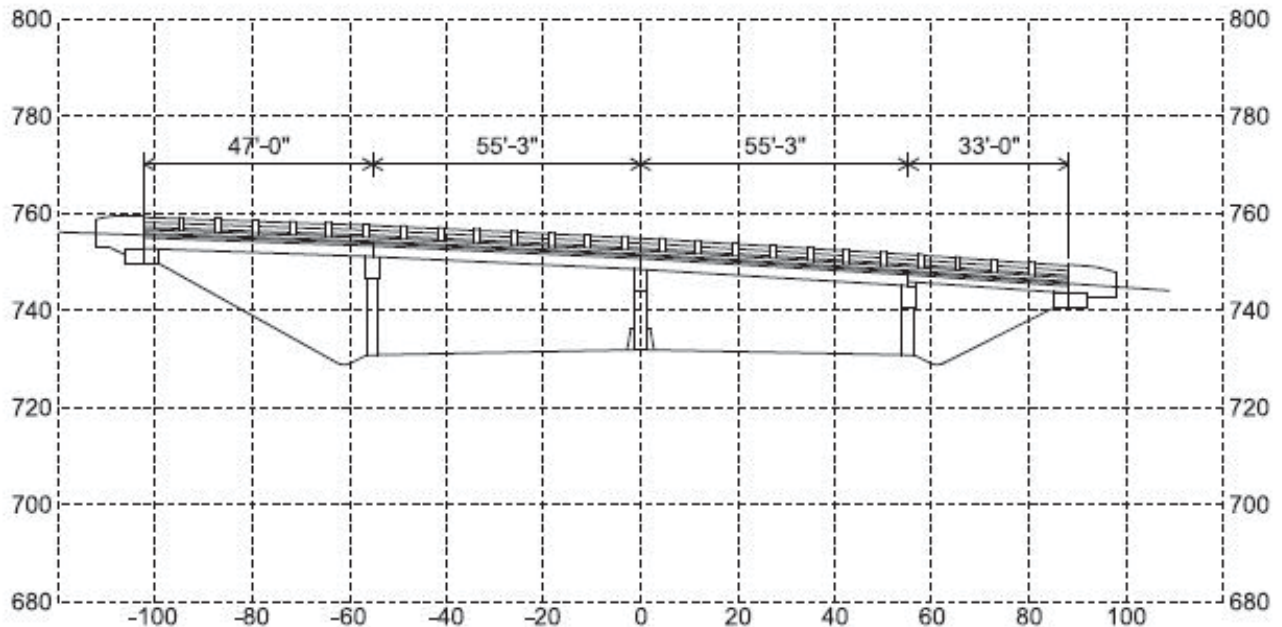
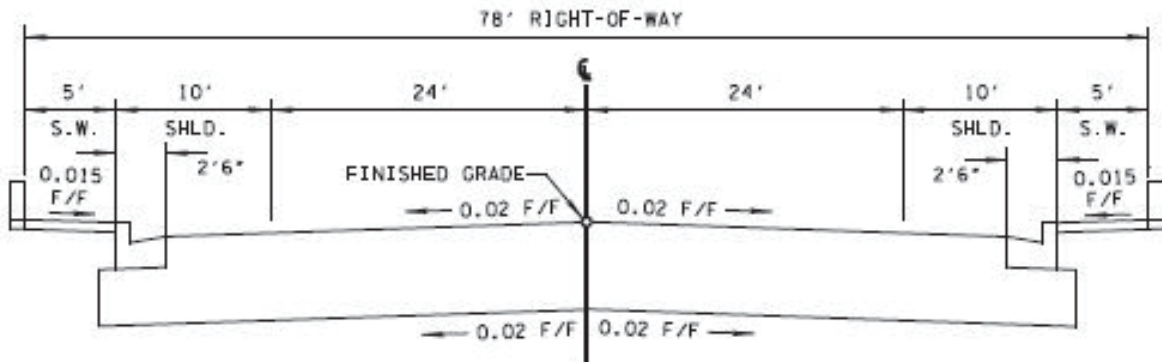


Figure 5: Belvoir Bridge over I-24 showing existing span length



EXISTING SECTION - BELVOIR AVENUE
(BASED ON STD. DWG. RD01-TS-6)

Figure 6: Existing Typical Section for Belvoir Avenue Bridge over I-24

Proposed Project Description

As discussed within the Alternative Build section of this document, four alternatives were discussed for the proposed bridge replacement for the I-24 bridge over Germantown Road. The first option, the baseline, utilizes traditional construction methods and further development on this option will not be continued at this time. This proposed plan will use one of the three accelerated bridge construction methods (4-span precast concrete, 2-span slide steel, or 2-span steel SPMT) (Figure 8 and 9). The proposed project will construct a bridge replacement to accommodate six lanes of traffic (three in each direction), full depth re-pavement to accommodate the wider bridge, and mill and overlay of Germantown road below propose bridge. (Figure 7). Depending on the Alternative selected, the width of the bridge will vary (see Figures 10 through 13).

In addition to the bridge replacement of the I-24 bridge over Germantown Road, the I-24 Exit Ramp 183 will be widened to accommodate two 12-foot lanes.

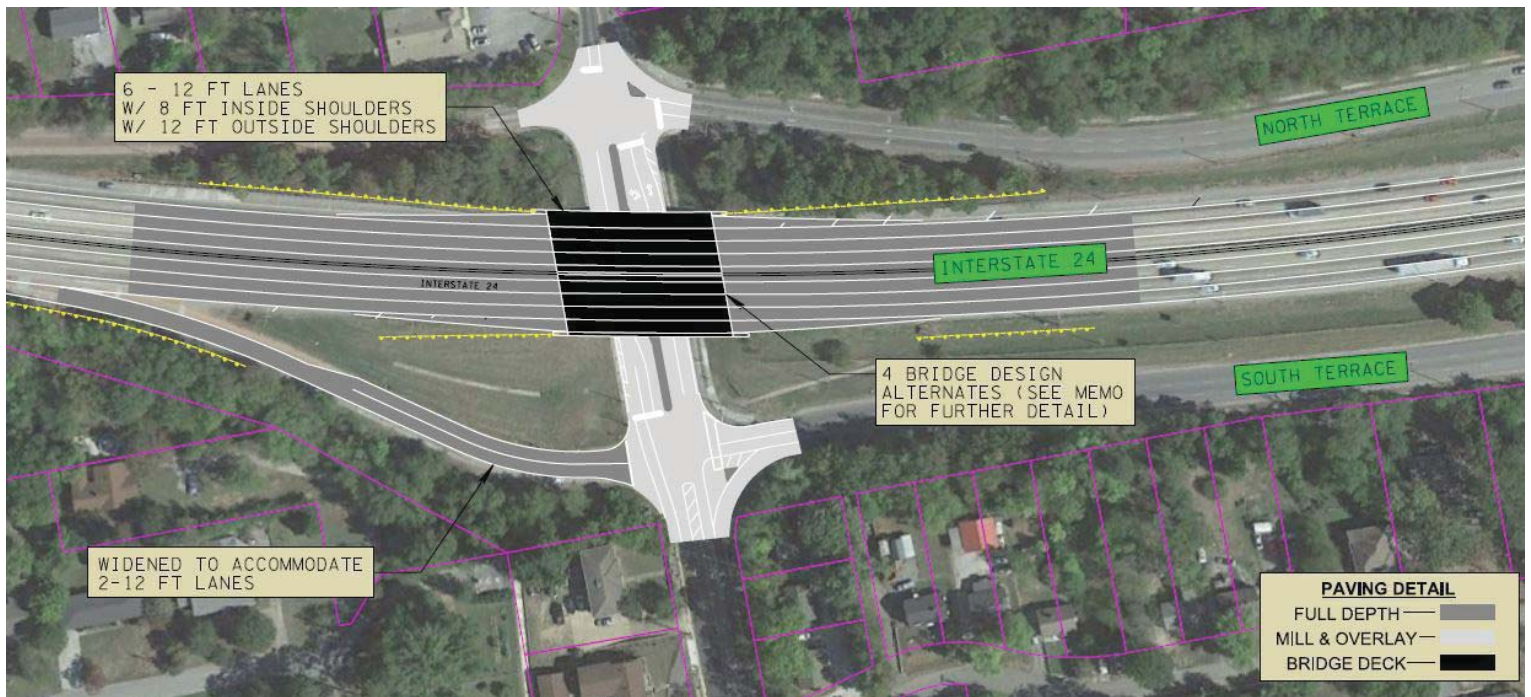


Figure 7: Proposed layout for I-24 bridge over Germantown Road and Exit Ramp 183

**PROPOSED STRUCTURE
4 SPAN PRECAST CONCRETE BOX BEAMS**

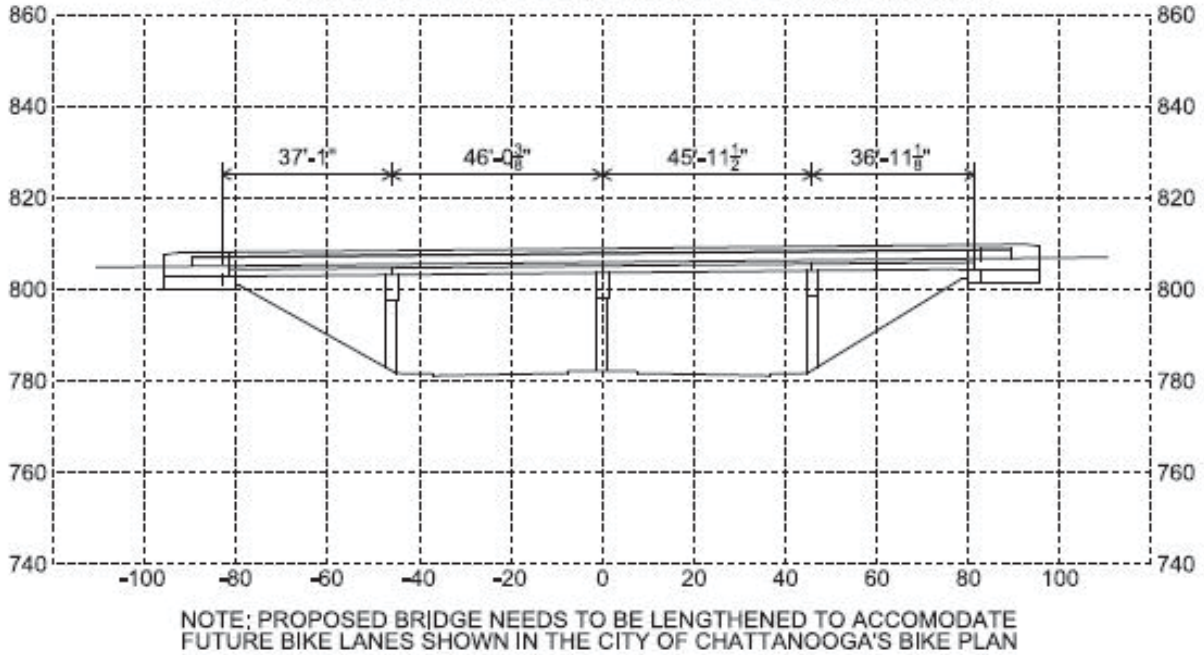


Figure 8: Proposed bridge profile for Alternative 1 (Concrete box beam)

**PROPOSED STRUCTURE
2 SPAN STEEL**

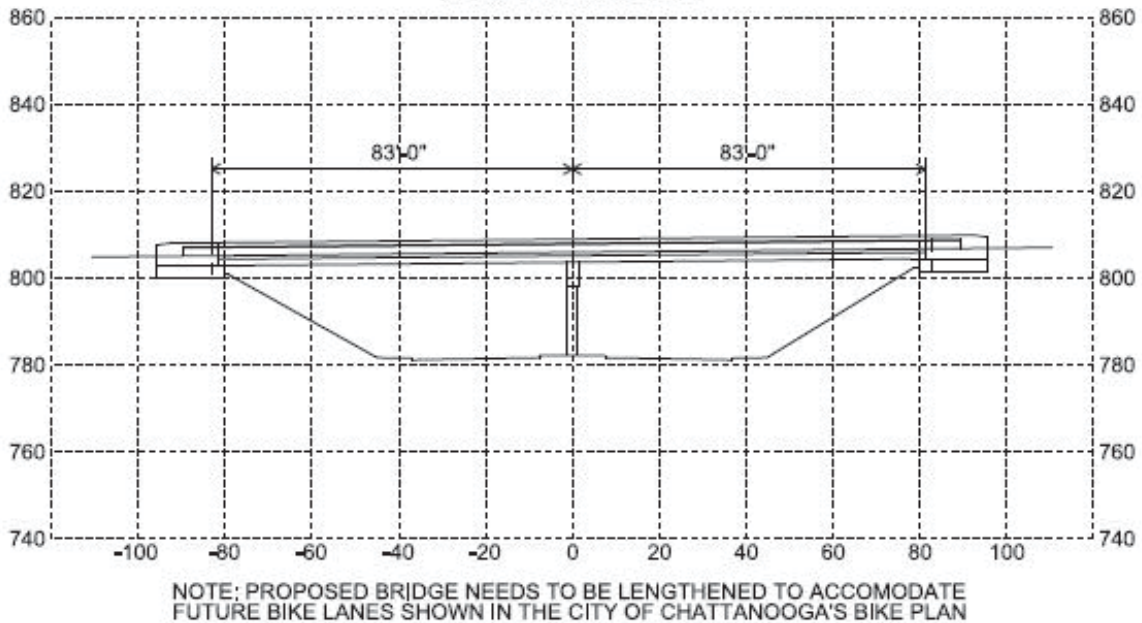


Figure 9: proposed bridge profile for Alternative 2 and 3 (steel bridge)

PROPOSED STRUCTURE
BASELINE: TRADITIONAL CONSTRUCTION - PCC BOX BEAMS

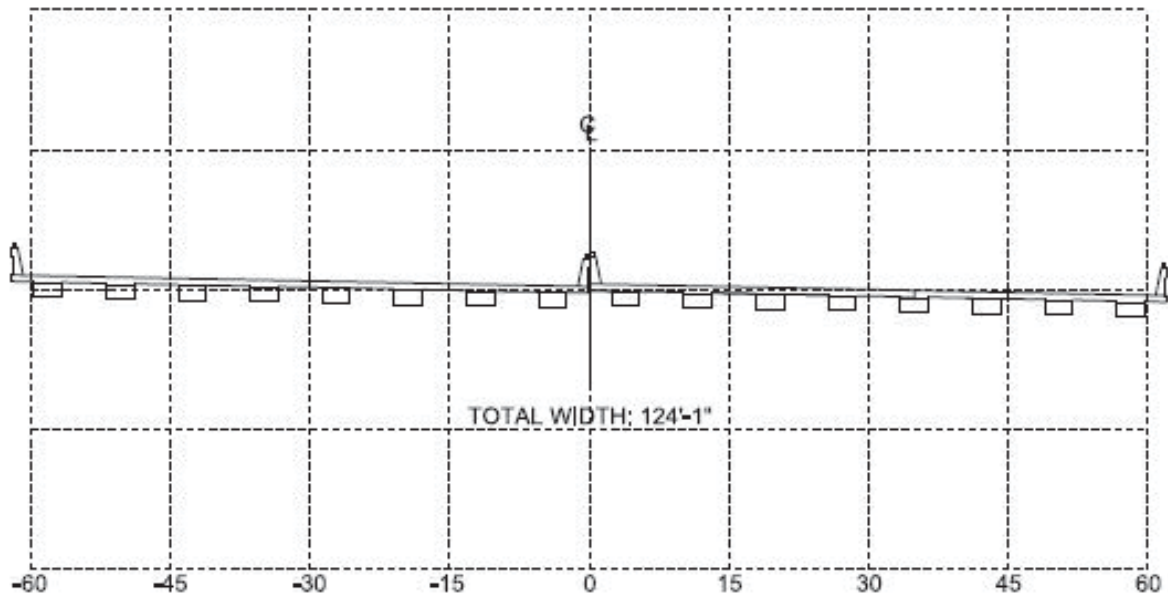


Figure 10: Proposed layout of Baseline Alternative

PROPOSED STRUCTURE
ALTERNATE 1: ABC - PRECAST CONCRETE BOX BEAMS

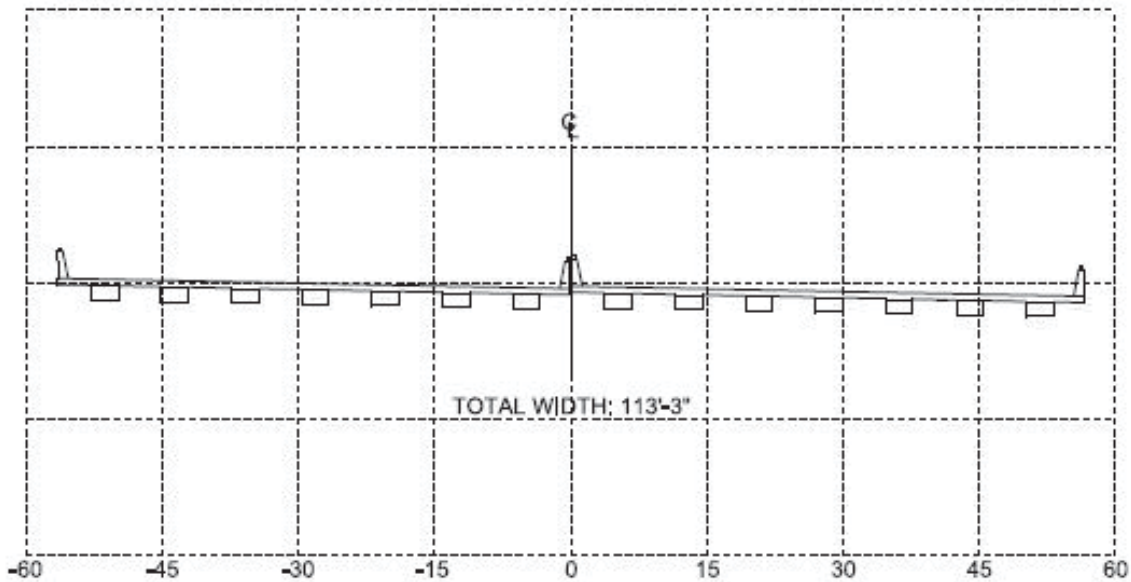


Figure 11: Proposed layout of Alternative 1

PROPOSED STRUCTURE
ALTERNATE 2: LATERAL SLIDE - 2 SPAN STEEL

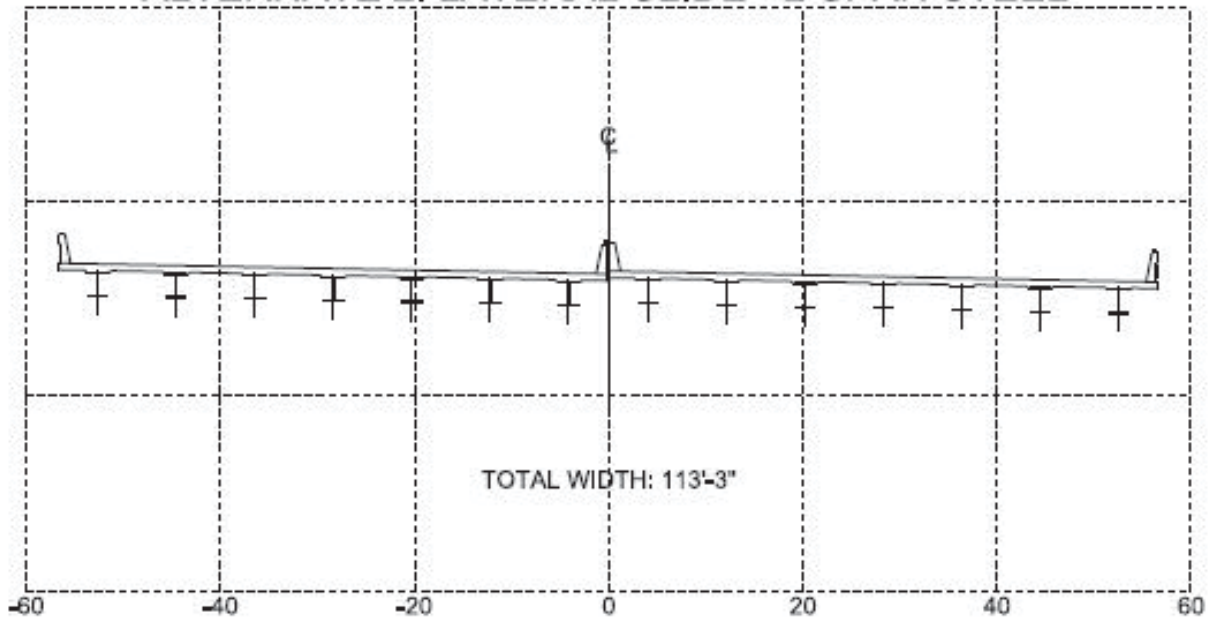


Figure 12: Proposed layout of Alternative 2

PROPOSED STRUCTURE
ALTERNATE 3: SPMT - 2 SPAN STEEL

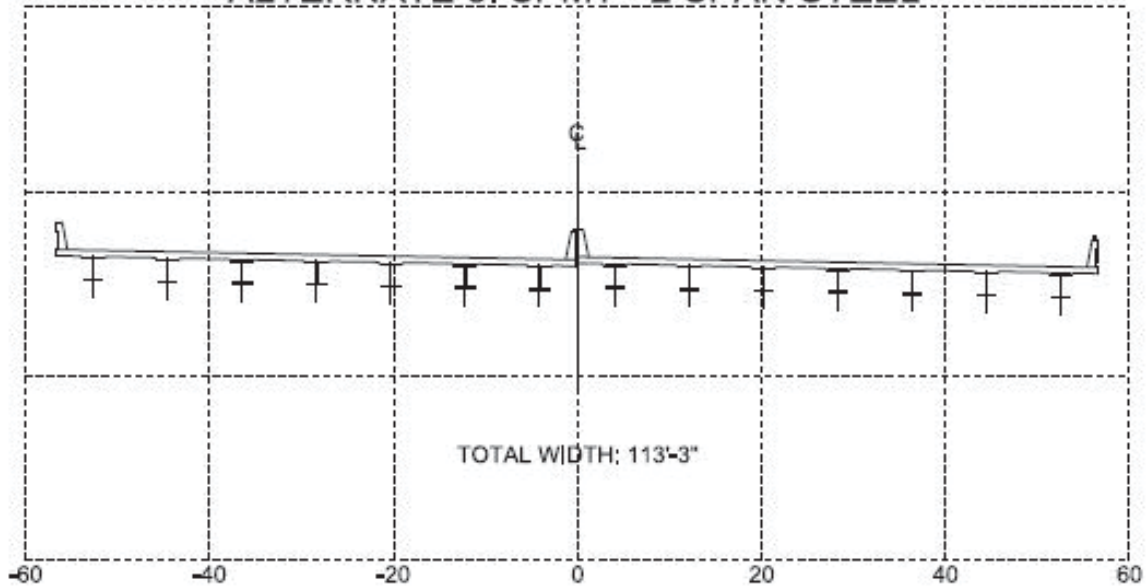


Figure 13: Proposed layout of Alternative 3

The proposed project will construct a bridge replacement to accommodate four lanes of traffic (two in each direction) and pedestrian access on either side, and the proposed project will mill and overlay Belvoir Avenue at the intersections of North Terrace Road and South Terrace Road (Figure 14).

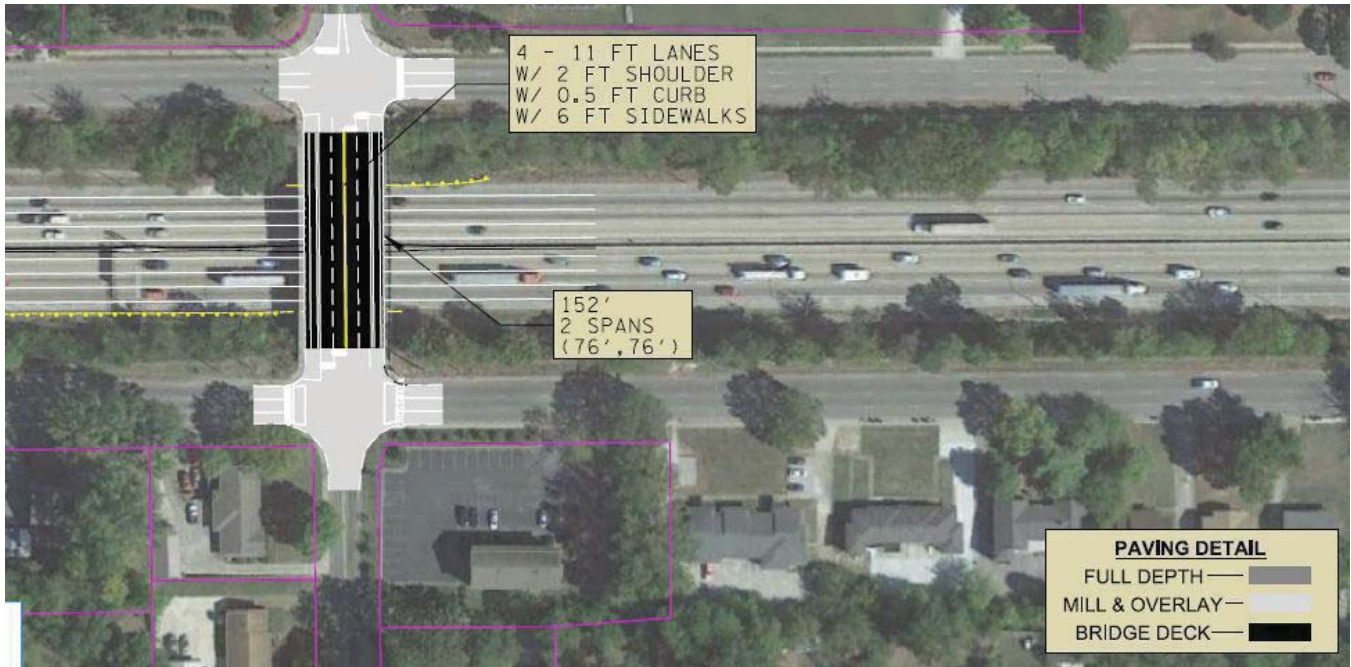


Figure 14: Proposed Layout of Belvoir Bridge over I-24

Proposed Typical Section

Two typical sections were provided for this proposed project, one for the I-24 bridge over Germantown Road and one for the Belvoir Avenue bridge over I-24. Description of the typical sections are below:

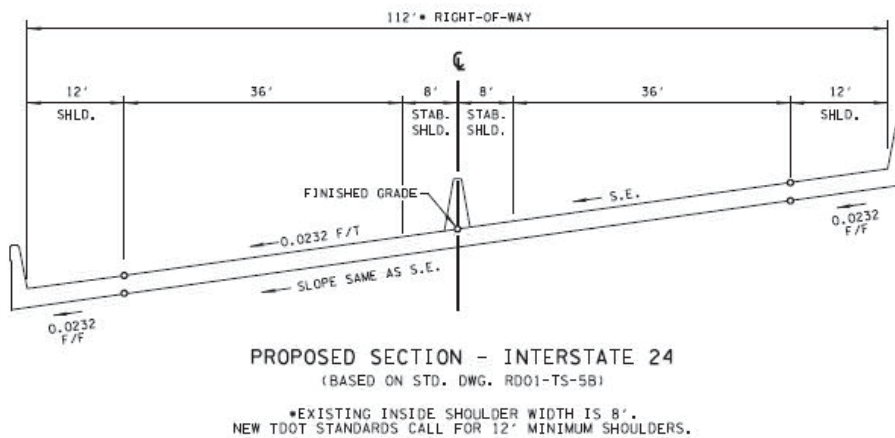
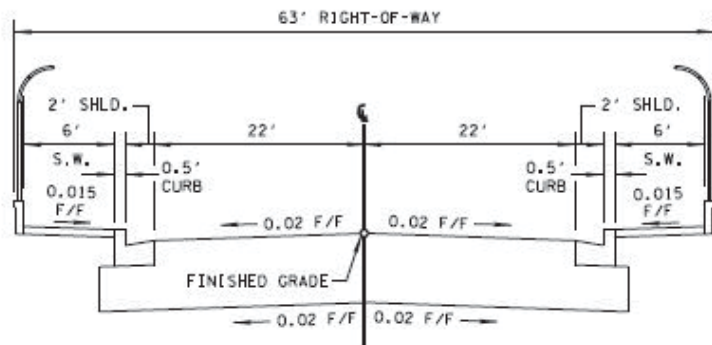


Figure 15: Typical Section of the I-24 bridge over Germantown Road

The proposed typical for I-24 bridge replacement over Germantown Road will consist of six 12-foot travel

lanes (three in each direction) with 8-foot inside shoulders and 12-foot outside shoulders.



PROPOSED SECTION - BELVOIR AVENUE
(BASED ON STD. DWG. RD01-TS-6A)

Figure 16: Typical Section of the Belvoir bridge over I-24

The proposed layout for the Belvoir bridge replacement over I-24 will consist of four 11-foot travel lanes (two in each direction) with 2-foot shoulders, 0.5-foot curb and 6-foot outside sidewalks

Right-of-Way

Does this project require the acquisition of right-of-way or easements?

No

Displacements and Relocations

Will this project result in residential, business or non-profit displacements and relocations?

No

Changes in Access Control

Will changes in access control impact the functional utility of any adjacent parcels?

No

Traffic and Access Disruption

At this time, are traffic control measures and temporary access information available?

Yes

Will this project involve traffic control measures that may result in major traffic disruptions?

No

Germantown Road Bridge

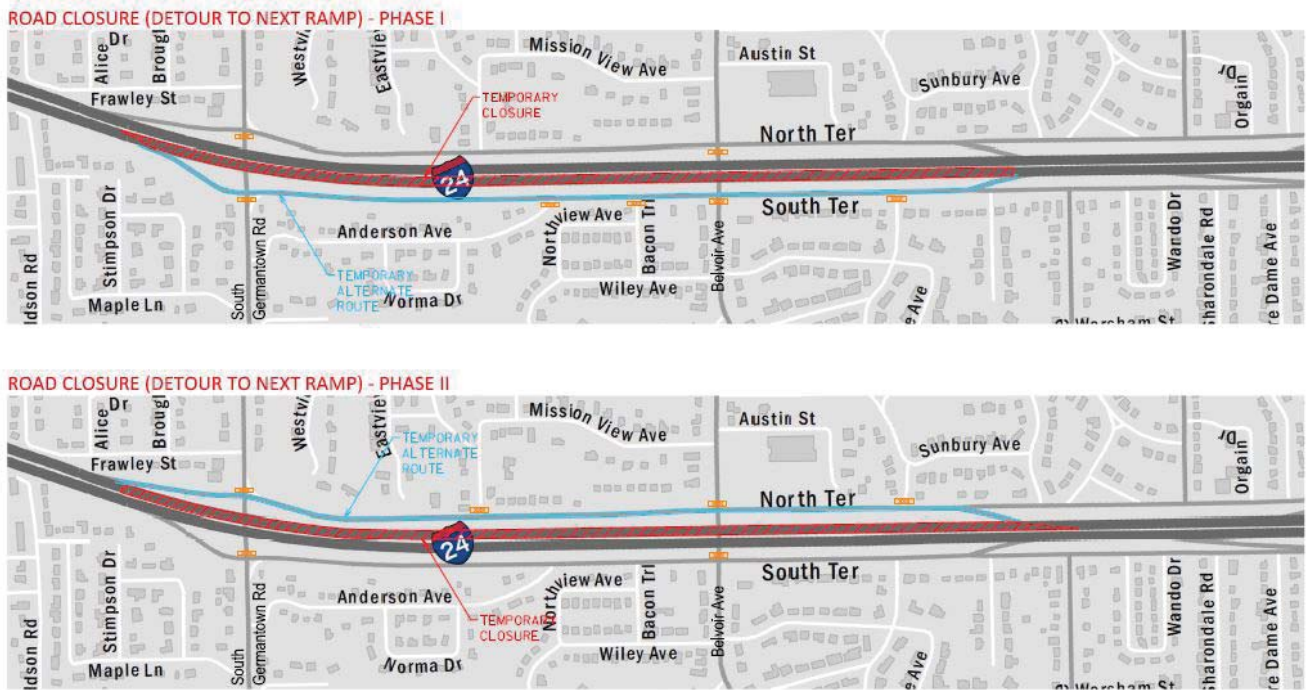
Based on the Technical Investment Report (TIR), there are four construction/traffic phasing plans for the Build Alternatives proposed for the I-24 bridge over Germantown Road (see Figure 17). The two traffic phasing alternatives proposed for Build Alternate 1, 3, and 4 propose full closure of I-24 eastbound (Phase I) followed by full closure of I-24 westbound (Phase II). The closed direction's traffic will be detoured off of I-24. During Phase I, eastbound traffic would be diverted to South Terrace and during Phase II, westbound traffic would be diverted to North Terrace (see

Figures 18 and 19). The two traffic phasing alternatives (proposed for Build Alternate 2 and 3) will shift traffic away from work zone, maintaining two lanes of traffic in both directions on I-24 during construction. Under these alternatives, during Phase I, traffic would be maintained along the inside lanes and during Phase II, traffic would be maintained along the newly expanded outside lanes and shoulders (see Figures 20 and 21).

Correspondence with the TDOT Region 2 Design has indicated that should a closure option be selected, the closure will be limited to the weekend, avoiding peak periods of traffic. The estimated time for these closures will not be more than a few weekends, but final decision will not be decided until further discussion with the Construction Manager/ General Contractor (CM/GC).

Construction Alternates		Bridge Alternates	Traffic Phasing Plans
Concrete Bridge	<i>Baseline</i>	Alternate 1	<i>Road Closure (Detour to Next Ramp)</i> <i>Road Closure (Temporary Ramp)</i>
	<i>Accelerated Bridge Construction</i>	Alternate 2	<i>Slide (Traffic Out then In)</i>
Steel Bridge- Lateral Slide		Alternate 3	<i>Road Closure (Detour to Next Ramp)</i> <i>Road Closure (Temporary Ramp)</i> <i>Slide (Traffic South then North)</i>
Steel Bridge - SPMT		Alternate 4	<i>Road Closure (Detour to Next Ramp)</i> <i>Road Closure (Temporary Ramp)</i>

Figure 17: Bridge Alternatives and Traffic Phase Plans



**Figure 18: Traffic Control Plan for the I-24 Bridge over Germantown Road
Road Closure (Detour to Next Ramp) Option**

If either Build Alternate 1, 3, or 4 is selected, one traffic phasing plan proposed is the Road Closure (Detour to Next Ramp). For this traffic phasing plan, the I-24 bridge replacement will implement a temporary closure of one direction of traffic during each phase of construction. This traffic will be rerouted onto either North Terrace or South Terrace, depending on phase. The detour will continue on these roadways until reaching the next entry ramp onto I-24.

During Phase I, the eastbound side of I-24 will be closed, diverting traffic onto South Terrace until reaching the I-24 ramp approximately 0.75-mile to the east. At this time Germantown Road, Belvoir Avenue, Anderson Avenue, Bacon Trail, and Brookfield Avenue will be barricaded to prevent access onto South Terrace. Germantown Road and Belvoir Avenue north of I-24 will also be closed to block access to work zones near the proposed bridges.

During Phase II, the westbound side of I-24 will be closed, diverting traffic onto North Terrace until reaching the next I-24 ramp approximately 0.75-mile to the west. At this time Germantown Road, Belvoir Avenue, Mission View Avenue, and Brookfield Avenue will be barricaded to prevent access onto North Terrace. Germantown Road and Belvoir Avenue north of I-24 will also be closed to block access to work zones near the proposed bridges.

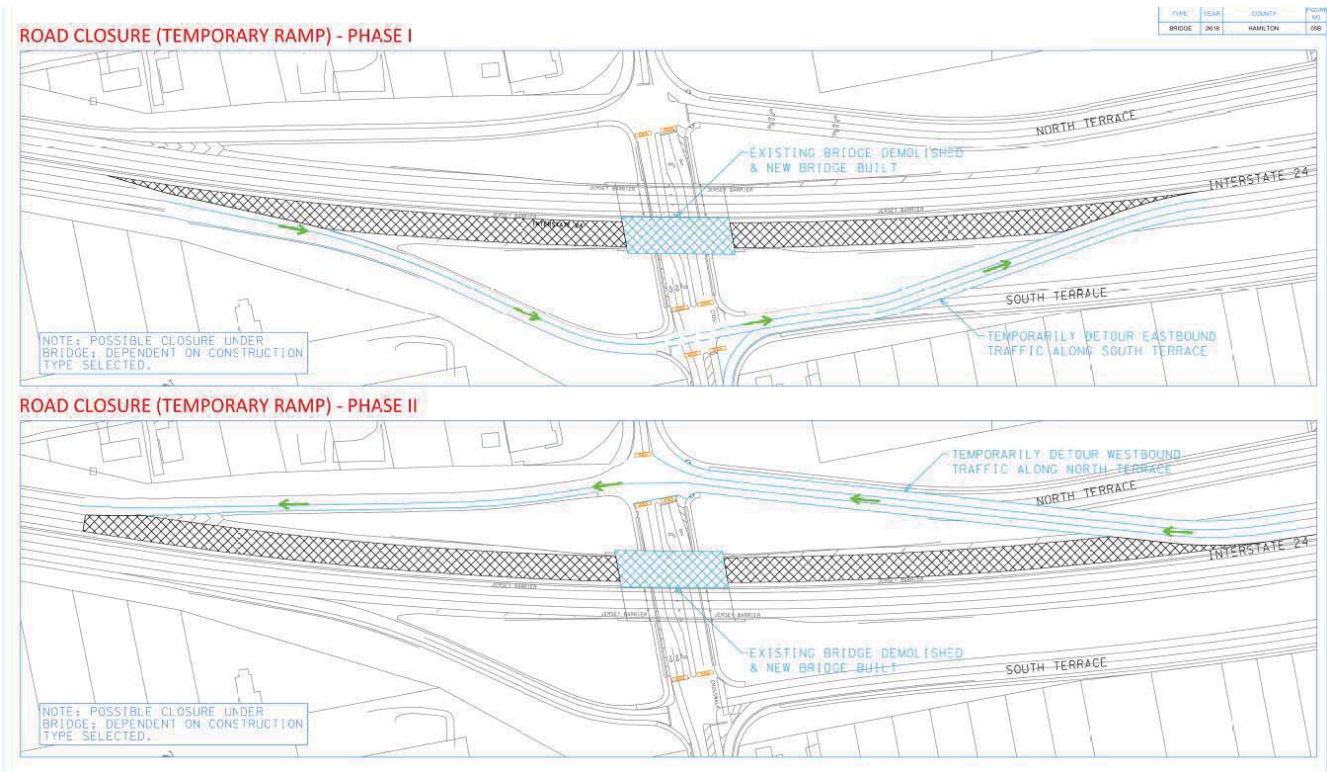


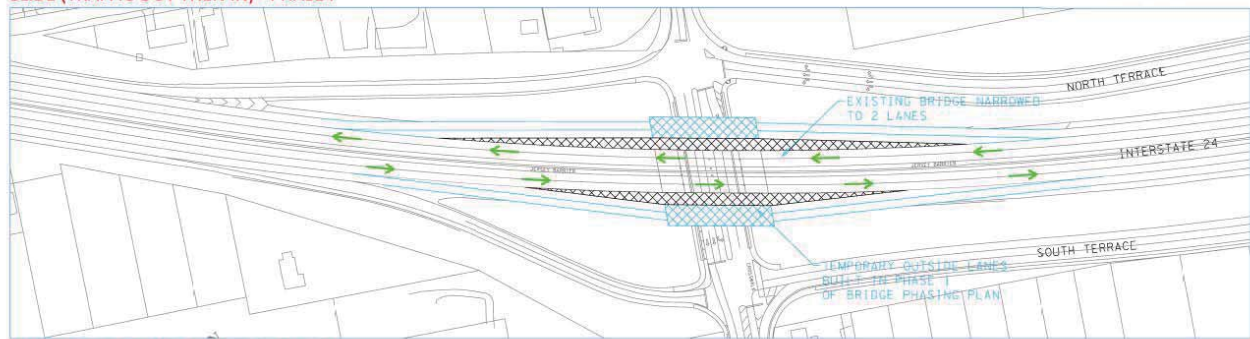
Figure 19: Traffic Control Plan for the I-24 Bridge over Germantown Road Road Closure (Temporary Ramp)

If either Build Alternate 1, 3, or 4 is selected, another traffic phasing plan proposed is the Road Closure (Temporary Ramp). For this traffic phasing plan, the I-24 bridge will implement a temporary closure of one direction of traffic during each phase of construction. This traffic will be routed onto either North Terrace or South Terrace, depending on phase. Temporary detour roads will be constructed on South Terrace and North Terrace, approximately 0.12 miles east of Germantown Road.

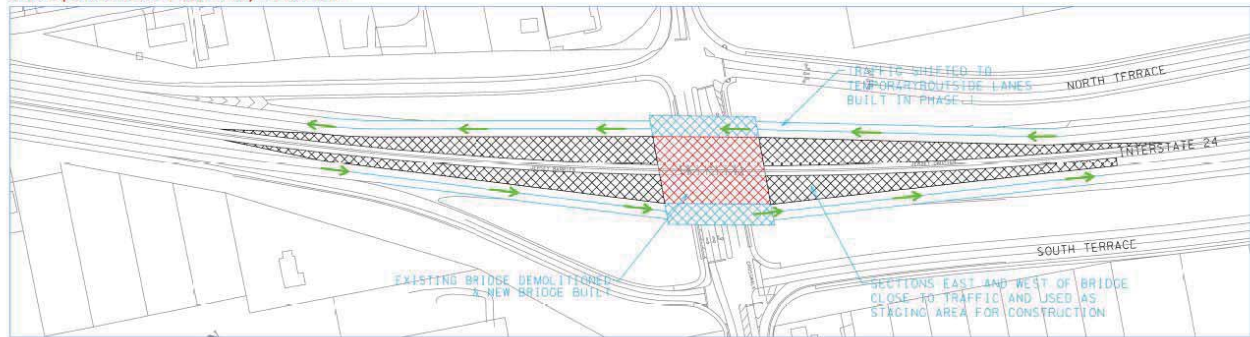
During Phase I, this option will allow eastbound traffic to exit I-24 from Exit 183 onto South Terrace, travel approximately 0.08-mile, and begin merging back onto I-24 using the temporary ramp. At this time, access to Germantown Road at the bridge will be closed using barricades at North Terrace and both sides of the South Terrace/Germantown Road intersection, leaving access for northbound Germantown Road traffic to turn right onto South Terrace.

During Phase II, this option will allow westbound traffic to exit I-24 onto North Terrace from a temporary ramp located approximately 0.12-mile from the Germantown Road intersection. This traffic can reenter I-24 westbound at the interstate exit located at the North Terrace/Germantown Road intersection. At this time, access to Germantown Road at the bridge will be closed using barricades at South Terrace and both sides of the North Terrace/Germantown Road intersection, leaving access for southbound Germantown Road traffic to turn right onto the I-24 entry ramp.

SLIDE (TRAFFIC OUT THEN IN) - PHASE I



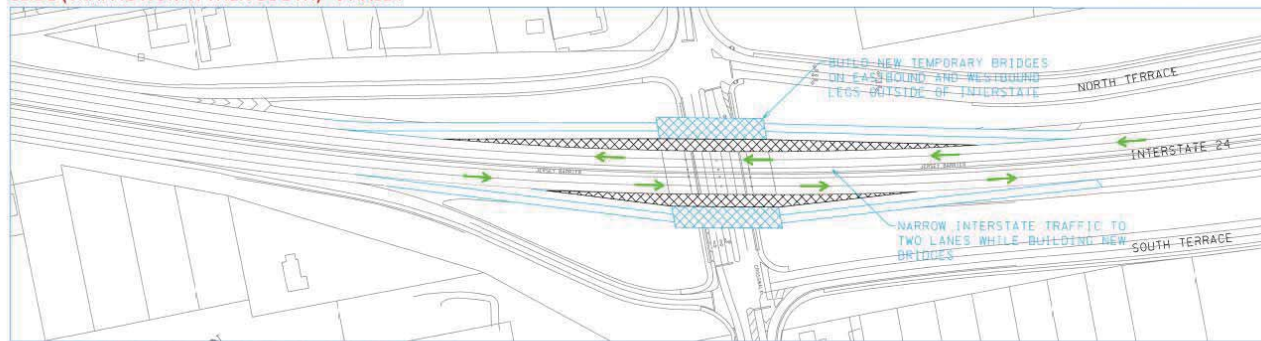
SLIDE (TRAFFIC OUT THEN IN) - PHASE II



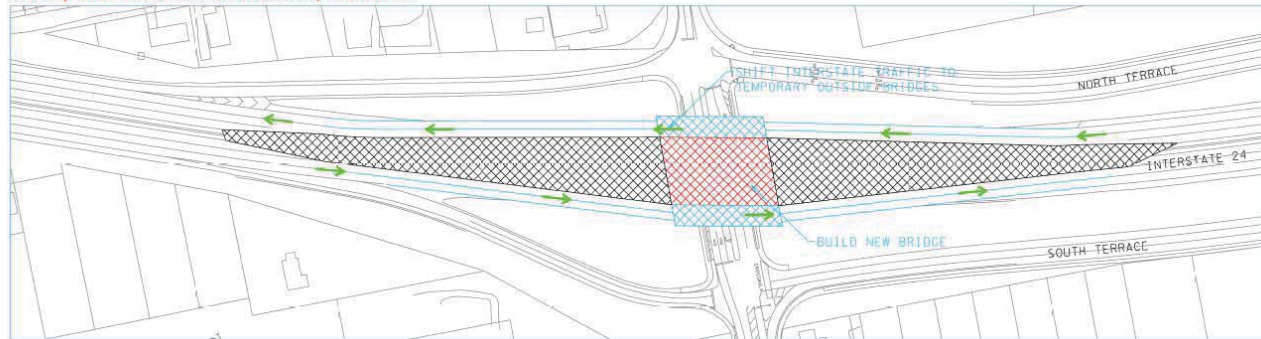
**Figure 20: Traffic Control Plan for the I-24 Bridge over Germantown Road
Slide (Traffic Out Then In) Option**

If Build Alternate 2 is selected, the traffic phasing plan proposed is the Slide (Traffic Out Then In). For this traffic phasing plan, the I-24 bridge will channel traffic in two phases, first to the inside of the bridge, then to outside. During Phase I, work-zones will be on the outside of either side of the bridge, leaving two lanes open on each side. At this time, temporary travel lanes will be constructed in preparation for Phase II. During Phase II, traffic will be channeled to the outside lanes onto the temporary lanes while construction continues on the inside of the proposed bridge.

SLIDE (TRAFFIC NORTH THEN SOUTH) - PHASE I



SLIDE (TRAFFIC NORTH THEN SOUTH) - PHASE II



**Figure 21: Traffic Control Plan for the I-24 Bridge over Germantown Road
Slide (Traffic North Then South) Option**

If Build Alternate 3 is selected, another traffic phasing plan proposed is the Slide (Traffic North Then South). For this traffic phasing plan, the I-24 bridge will channel traffic in two phases, first to the inside of the bridge, then to outside. During Phase I, the proposed traffic plan will construct temporary bridges, which will accommodate traffic during Phase II while completing the reconstruction of the proposed I-24 bridge. At this time, the traffic on either side will be shifted to two lanes only. During Phase II, traffic will be directed to the temporary bridges constructed during Phase I while the proposed I-24 bridge is demolished and constructed.

Belvoir Avenue Bridge

Based on the TIR, the Belvoir Avenue bridge will be fully closed utilizing a detour onto North and South Terrace at the time of construction. The contractor will be expected to maintain two lanes of traffic on the I-24 at all times; however, rolling road blocks, and/or night/weekend closures with temporary detours while setting beams may be necessary for short durations.

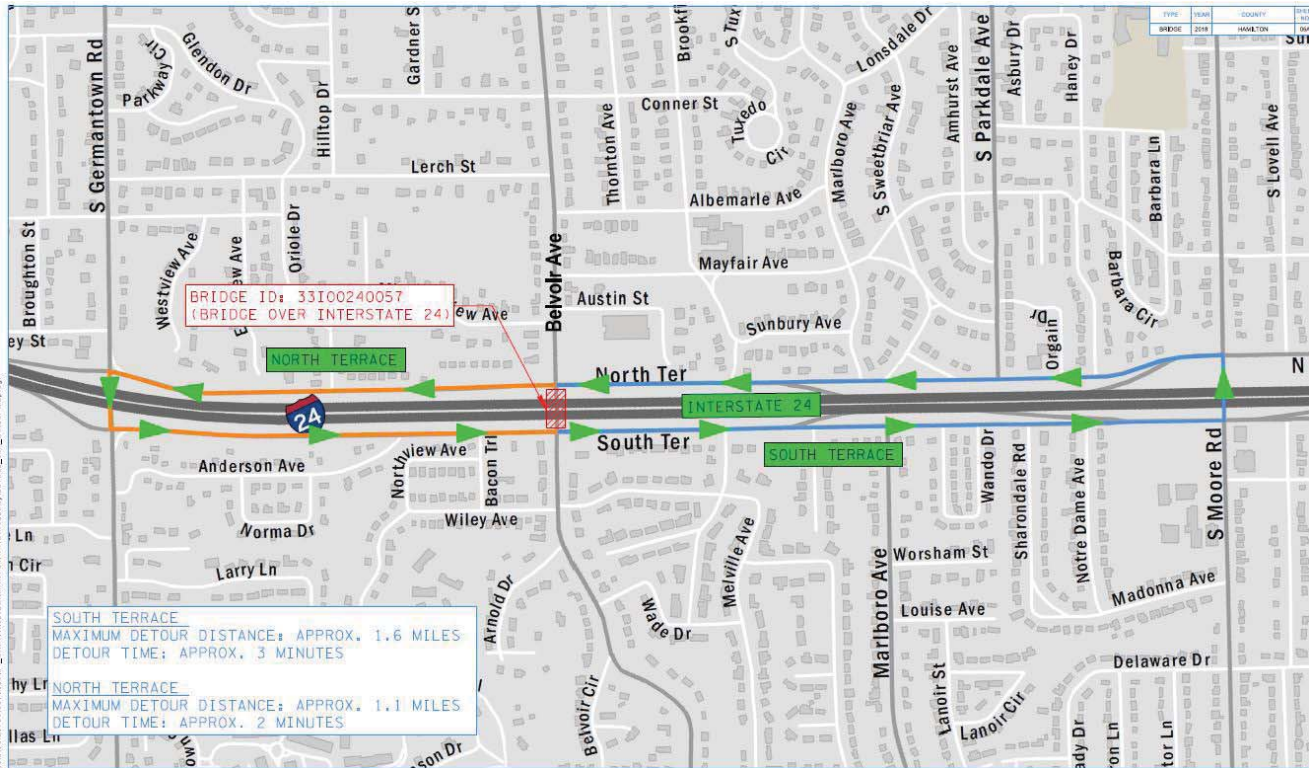


Figure 22: Traffic Control Plan for Belvoir Avenue Bridge

During the construction of the Belvoir Avenue Bridge over I-24, Belvoir Avenue will be closed at the North Terrace and South Terrace intersections and I-24 below the bridge. During the construction of the bridge, two detour plans will be utilized to channel traffic around closed roadways (see Figure 22). South of the Belvoir Avenue bridge at Belvoir Avenue, the first detour will direct traffic east onto South Terrace, left onto South Moore Road, and then left onto North Terrace for an approximate 1.6-mile detour. North of the bridge, the second detour will direct traffic west onto North Terrace, left at Germantown Road, and then left onto South Terrace for an approximate 1.1-mile detour.

Due to the need to coordinate traffic control, it is anticipated that one of the bridges can be completed before the other; however, the CM/GC will have the latitude to determine the phasing and detouring of traffic. The full traffic control descriptions and layout sheets can be found in the TIR, which is located within the Technical Appendices. Also, a copy of the correspondence with TDOT Region 2 Design is included in the Technical Appendices.

Environmental Studies

Water Resources

Are there any water resources, wetlands or natural habitat located within the project area?

Yes

Water Resources				
Resource Type	Label	Quality	Impact Type	Amount
Intermittent Stream	STR-1	303d Listed	Runoff	645 feet
Intermittent Stream	STR-2	303d Listed	Runoff	460 feet
Intermittent Stream	STR-3	303d Listed	Runoff	868 feet

*Units measured in linear feet.

Mitigation of impacts to streams or any other fluvial systems will be accomplished through the avoidance and minimization of potential impacts during the design process. Permanent stream alterations such as relocations, impoundments or channel modification will be mitigated on-site to the extent possible in order to return the channel to its most probable natural state. Impacts that cannot be mitigated on-site will be subject to a compensatory mitigation plan that may include restoration of a comparable resource or application of an in-lieu fee program.

An Environmental Boundaries Report (EBR) was completed on 4/23/2018 for the proposed project area. Within the EBR, three intermittent streams were noted within the project area. All three streams are identified as Exceptional Tennessee Waters (ETWs) and 303(d) listed as impaired streams due to situation, habitat, and E. coli. The Amount for each stream listed in the table above represents the estimated lengths of potential impacts to those streams within the project area, including previously impacted resources.

Protected Species

Are the GPNEA between TDOT and USFWS (2017) and TDEC-DNA (2015) applicable to this project?

No

Rare Species Dataviewer:

The TDEC Rare Species Dataviewer was reviewed on 03/20/2018

Rare Species List			
Species Name	Status	Species Potential within Right-of-Way	Accommodations
<i>Lonicera flava</i>	State	Low Potential: Present habitat unsuitable	BMP's
<i>Aneides aeneus</i>	Rare, not State Listed	Low Potential: Present habitat unsuitable	BMP's
<i>Ardea herodias</i>	Rare, not State Listed	Low Potential: Present habitat unsuitable	BMP's
<i>Aureolaria patula</i>	State	Low Potential: Present habitat unsuitable	BMP's
<i>Cambarus extraneus</i>	State	Low Potential: Present habitat unsuitable	BMP's
<i>Clematis glaucophylla</i>	State	Low Potential: Present habitat unsuitable	BMP's
<i>Dromus dromas</i>	Fed/State	Low Potential: Present habitat unsuitable	BMP's
<i>Gratiola floridana</i>	State	Low Potential: Present habitat unsuitable	BMP's
<i>Hydrolea quadrivalvis</i>	State	Low Potential: Present habitat unsuitable	BMP's
<i>Percina tanasi</i>	Fed/State	Low Potential: Present habitat unsuitable	BMP's
<i>Quadrula intermedia</i>	Fed/State	Low Potential: Present habitat unsuitable	BMP's
<i>Rallus elegans</i>	State	Low Potential: Present habitat unsuitable	BMP's
<i>Trillium lancifolium</i>	State	Low Potential: Present habitat unsuitable	BMP's
<i>Trillium rugelii</i>	State	Low Potential: Present habitat unsuitable	BMP's

Based on the Rare Species Dataviewer, reviewed on 3/20/2018, there is one protected species within the one-mile radius of the project limits (*Lonicera flava*) and thirteen within a four-mile radius of the project limits. All species listed are noted to have a low potential to be found within the project area due to the present habitat being unsuitable. Although suitable habitat for these species are unsuitable, Best Management Practices (BMP's) will be installed and maintained during construction activities.

A Bat Survey Report was completed for the project on 6/27/2018 to determine the presence of the federally endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*). In a letter dated 6/28/2018, the TDOT Ecology Section presented the negative results to the U.S. Fish and Wildlife Service (USFWS) concluding that the proposed project "may affect, not likely to adversely affect" the federally endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*).

A copy of the EBR, Bat Survey Report, and the Section 7 clearance letter are located within the Technical Appendices.

U.S. Fish and Wildlife Service (USFWS):

Coordination with the USFWS was completed on 07/23/2018

Coordination with USFWS was conducted, and on 7/23/2018 their response was received. This correspondence is located in the Technical Appendices. A passage from this response is provided below:

"A mist netting survey was performed in May 23 and May 24, 2018, at one site determined to be a suitable netting location. Efforts resulted in no bat captures. Due to negative survey results for the Indiana bat and NLEB, we concur with TDOT's determinations of "not likely to adversely affect" for these species. This survey will be valid until April 1, 2024.

We are not aware of any other federally listed or proposed species that would be impacted by the project. Therefore, based on the best information available at this time, we believe that the requirements of section 7 of the Endangered Species Act (Act) of 1973, as amended, are fulfilled for all species that currently receive protection under the Act."

Tennessee Wildlife Resources Agency (TWRA):

Coordination with TWRA was completed on 04/16/2018

Coordination with TWRA was conducted, and on 4/16/2018 their response was received. Their email correspondence is located in the Technical Appendices. A passage from this response is provided below:

"My data concur with the information you have sent me. I do not have specific specie request for this project. The implementation of BMPs will be sufficient to satisfy the needs of the TWRA."

Floodplain Management

Flood Zone: Zone X (White) - Area Determined to be Outside the 500-year Floodplain.

The project is not in a FEMA floodway, floodplain, or study area.

The proposed project is located on two Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) Map Number 47065C0344G, Panel 344 of 530 and Map Number 47065C0363G, Panel 363 of 530. A copy of these FEMA FIRM maps are located in the Attachments.

Air Quality

Transportation Conformity:

Recent coordination with the TDOT Air and Noise Section was completed on 3/19/2018 providing a response stating "This project is in Hamilton County which is in attainment for all regulated criteria pollutants. Therefore, conformity does not apply to this project."

Mobile Source Air Toxics (MSAT):

Within the same coordination mentioned above, TDOT Air and Noise Section stated "This project qualifies as a categorical exclusion under 23 CFR 771.117 and does not require a Mobile Source Air Toxics (MSATs) evaluation per FHWA's [Federal Highway Administration's] 'Interim Guidance Update on Air Toxic Analysis in NEPA [National Environmental Policy Act] Documents' dated October 2016."

Noise

In accordance with FHWA requirements and TDOT's Noise Policy this project is determined to be **Type III**

No significant noise impacts are anticipated for this project and a noise study is not needed.

Farmland

Is this project exempt from the provisions of the Farmland Protection Policy Act (FPPA)?

Yes

FPPA Exemption: Small Acreage (3 acres or less for an existing bridge or interchange)

Section 4(f)

Does this project involve the use of property protected by Section 4(f) (49 USC 303)?

No

Section 6(f)

Does this project involve the use of property assisted by the L&WCF?

No

Cultural Resources

Does the Interstate Highway exemption or MOU between TDOT and the SHPO (2015) apply?

Yes

Exemption: Federal Interstate Highway Exemption

Native American Consultation

Does this project require Native American consultation?

No

Environmental Justice

Are there any disproportionately high or adverse effects on low-income or minority populations?

No

Environmental Justice Analysis Tables

Minority Populations							
Census Tract (CT)/ Block Group (BG)	CT 28 BG 1	CT 28 BG 2	CT 28 BG 3	CT 117 BG 2	CT 117 BG 3	CT 119 BG 1	Hamilton Co.
% Minority/Non-White	16.1%	28.7%	29.0%	37.7%	18.4%	32.2%	28.5%
Exceeds County Average by 10% or More	No	No	No	No	No	No	
Is BG Population Avg. >50%	No	No	No	No	No	No	
Meet EJ Criteria?	No	No	No	No	No	No	
Low-Income Populations							
Census Tract (CT)/ Block Group (BG)	CT 28 BG 1	CT 28 BG 2	CT 28 BG 3	CT 117 BG 2	CT 117 BG 3	CT 119 BG 1	County
% Low-Income/Below Poverty Line	3.4%	18.5%	14.0%	13.3%	11.8%	2.6%	14.8%
Exceeds County Average by 10% or More	No	No	No	No	No	No	
Is BG Population Avg. >50%	No	No	No	No	No	No	
Meet EJ Criteria?	No	No	No	No	No	No	

Source: U.S. Census Bureau, 2012-2016 American Community Survey (ACS) 5-Year Estimates. ACS data was accessed and reviewed on 8/23/2018 via *American FactFinder*, from the U.S. Census Bureau website.

The environmental justice (EJ) analysis utilizes annual U.S. Census Bureau data from the 2012-2016 American Community Survey (ACS) 5-Year Estimates database. The project area encompasses six census block groups: Census Tract (CT) 28, Block Group (BG) 1; CT 28, BG 2; CT 28, BG 3; and CT 117, BG 2; CT 117, BG 3; CT 119, BG 1. The EJ Analysis Table (Above) displays the population data for these block groups comparing their respective minority population and low-income population percentages to that of the entire county. According to Executive Order (EO) 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, EJ analyses serve to ensure that each Federal agency “shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, any disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations.”

Minority Populations

The subject block groups minority population percentages (CT 28, BG 1 - 16.1 percent; CT 28, BG 2 - 28.7 percent; CT 28, BG 3 - 29.0 percent; CT 117, BG 2 - 37.7 percent; CT 117, BG 3 - 18.4 percent; and CT 119, BG 1 - 32.2 percent) do not exceed the Hamilton County percentage (28.5 percent) by 10 percentage points or more, nor are they greater than 50 percent of their respective block group's total populations. Block groups that satisfy either of these criteria are considered to be EJ populations.

Low-Income Populations

The subject block groups low-income population percentages (CT 28, BG 1 - 3.4 percent; CT 28, BG 2 - 18.5 percent; CT 28, BG 3 - 14.0 percent; CT 117, BG 2 - 13.3 percent; CT 117, BG 3 - 11.8 percent; and CT 119, BG 1 - 2.6 percent) do not exceed the Hamilton County percentage (14.8 percent) by 10 percentage points or more, nor are they greater than 50 percent of their respective block group's total populations. Block groups that satisfy either of these criteria are considered to be EJ populations.

Summary

Based on the EJ analysis of the demographic data provided by the U.S. Census Bureau and 2012-2016 ACS, CT 28, BG 1; CT 28, BG 2; CT 28, BG 3; and CT 117, BG 2; CT 117, BG 3; CT 119, BG 1. do not satisfy any of the EJ criteria reviewed for this analysis; therefore, the block groups do not contain high enough percentages of minority or

low-income populations that would qualify as EJ concerns for the proposed project. All populations included within the proposed project area are expected to benefit equally from the proposed improvements.

Hazardous Materials

Does the project involve any asbestos containing materials?

No

Does the project involve any other hazardous material sites?

No

Bicycle and Pedestrian

Does this project include accommodations for bicycles and pedestrians?

Yes

In regards to the I-24 bridge over Germantown Road, recent Bicycle and Pedestrian coordination with the TDOT Multimodal Transportation Resources Division was completed on 3/20/2018 providing a response stating "This project is exempt from multimodal accommodation. It is a bridge replacement project for a facility where such users are prohibited."

Email coordination was completed on 8/23/2018 regarding the Belvoir Avenue bridge. The TDOT Multimodal Transportation Resources Division provided a response stating "The portion of the project on the Belvoir Ave bridge accommodates pedestrians with 6' sidewalks on both sides of the roadway."

A copy of this coordination is located within the Technical Appendices.

Environmental Commitments

Does this project involve any environmental commitments?

No

Additional Environmental Issues

Are there any additional environmental concerns involved with this project?

No

Conclusion

Review Determination

Determination: Programmatic Categorical Exclusion

This federal-aid highway project qualifies for a Categorical Exclusion under 23 C.F.R 771.117(d) and does not exceed the thresholds listed in Section IV(A)(1)(b) of the 2016 Programmatic Agreement between the Federal Highway Administration, Tennessee Division and the Tennessee Department of Transportation. The Department has determined that the specific conditions and criteria for these CEs are satisfied and that significant environmental impacts will not result from this action. This project is therefore designated as a Programmatic Categorical Exclusion and does not require Administration approval.

Reference Material

All source material used in support of the information and conclusions presented in this document are included in the attachments and technical appendices. The attachments are located at the end of the environmental document and include information on funding, agency concurrence, applicable agency agreements, and special commitment support. The technical appendices are compiled as a separate document and include the project plans, technical reviews, reports and any other additional information.

Preparer Certification

By signing below, you certify that this document has been prepared in compliance with all applicable environmental laws, regulations and procedures. You can attest to the document's quality, accuracy, and completeness, and that all source material has been compiled and included in the attachments and technical appendices.

Digitally signed by Kimberly Vasut-Shelby
Shelby
Date: 2018.10.19 09:06:36 -05'00'

Document Preparer

Document Approval

By signing below, you officially concur that this document is in compliance with all applicable environmental laws, regulations and procedures. You have reviewed and verified the document's quality, accuracy, and completeness and that all source material has been compiled and included in the attachments and technical appendices.

Digitally signed by Erick K. Hunt-Hawkins
DN: cn=Erick K. Hunt-Hawkins, o=TDOT,
ou=Environmental Division,
email=Erick.Hunt-Hawkins@tn.gov, c=US
Date: 2018.10.19 09:08:33 -05'00'

Tennessee Department of Transportation

Attachments

Acronyms

AADT	Annual Average Daily Traffic	NRCS	Natural Resources Conservation Service
ADA	Americans with Disabilities Act	NRHP	National Register of Historic Places
APE	Area of Potential Effect	PCE	Programmatic Categorical Exclusion
BMP	Best Management Practice	PIN	Project Identification Number
CAA	Clean Air Act	PM	Particulate Matter
CE	Categorical Exclusion	PND	Pond
CEQ	Council on Environmental Quality	RCRA	Resource Conservation and Recovery Act
CFR	Code of Federal Regulations	ROW	Right-of-Way
CMAQ	Congestion Mitigation and Air Quality	ROD	Record of Decision
DEIS	Draft Environmental Impact Statement	RPO	Rural Planning Organization
FEMA	Federal Emergency Management Agency	SIP	State Implementation Plan
FONSI	Finding of No Significant Impact	SNK	Sinkhole
EA	Environmental Assessment	SR	State Route
EIS	Environmental Impact Statement	STIP	State Transportation Improvement Program
EJ	Environmental Justice	STR	Stream
EPA	Environmental Protection Agency	TDEC	TN Department of Environment and Conservation
EPH	Ephemeral Stream	TDOT	Tennessee Department of Transportation
FHWA	Federal Highway Administration	TIP	Transportation Improvement Program
FIRM	Flood Insurance Rate Map	SHPO	State Historic Preservation Office
FPPA	Farmland Protection Policy Act	TPO	Transportation Planning Organization
GHG	Greenhouse Gas	TVA	Tennessee Valley Authority
GIS	Geographic Information System	TWRA	Tennessee Wildlife Resources Agency
IAC	Interagency Consultation	USDOT	U.S. Department of Transportation
LWCF	Land and Water Conservation Fund	USACE	U.S. Army Corps of Engineers
LOS	Level of Service	USFWS	U.S. Fish and Wildlife Service
MOA	Memorandum of Agreement	UST	Underground Storage Tank
MOU	Memorandum of Understanding	VMT	Vehicle Miles Traveled
MPO	Metropolitan Planning Organization	VPD	Vehicles Per Day
MSAT	Mobile Source Air Toxics	WWC	Wet Weather Conveyance
NEPA	National Environmental Policy Act		

State Transportation Improvement Program

OLD Transportation Improvement Program Fiscal Years 2017-2020

TIP # State DOT PIN # Lead Agency

County Length mi L RTP #

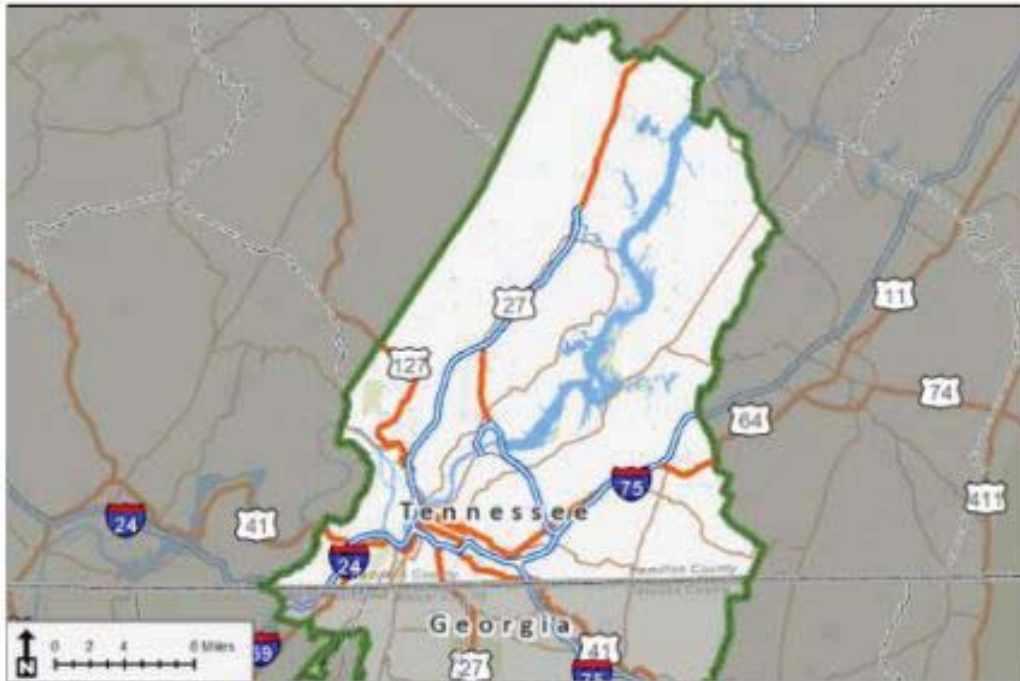
Route / Project Name Total Project Cost

Termini / Intersection

Project Description

Fiscal Year	Phase	Funding Type	Total Funds	Federal Funds	State Funds	Local Funds
2017	PE, ROW, CONST	NHPP	\$4,894,701	\$3,915,761	\$978,940	\$0
2018	PE, ROW, CONST	NHPP	\$2,894,701	\$2,315,761	\$578,940	\$0
2019	PE, ROW, CONST	NHPP	\$2,894,701	\$2,315,761	\$578,940	\$0
2020	PE, ROW, CONST	NHPP	\$2,894,701	\$2,315,761	\$578,940	\$0

Amendment	Date	Adjustment	Date	Remarks
Amendment 1	<input type="text"/>	Adjustment 1	3/21/2017	<input type="text"/>
Amendment 2	<input type="text"/>	Adjustment 2	<input type="text"/>	
Amendment 3	<input type="text"/>	Adjustment 3	<input type="text"/>	
Amendment 4	<input type="text"/>	Adjustment 4	<input type="text"/>	



Map is for illustrative purposes only and depicts conceptual project corridors and areas.

FY2017-2020 TIP: Chattanooga / Hamilton County / North Georgia Transportation Planning Organization

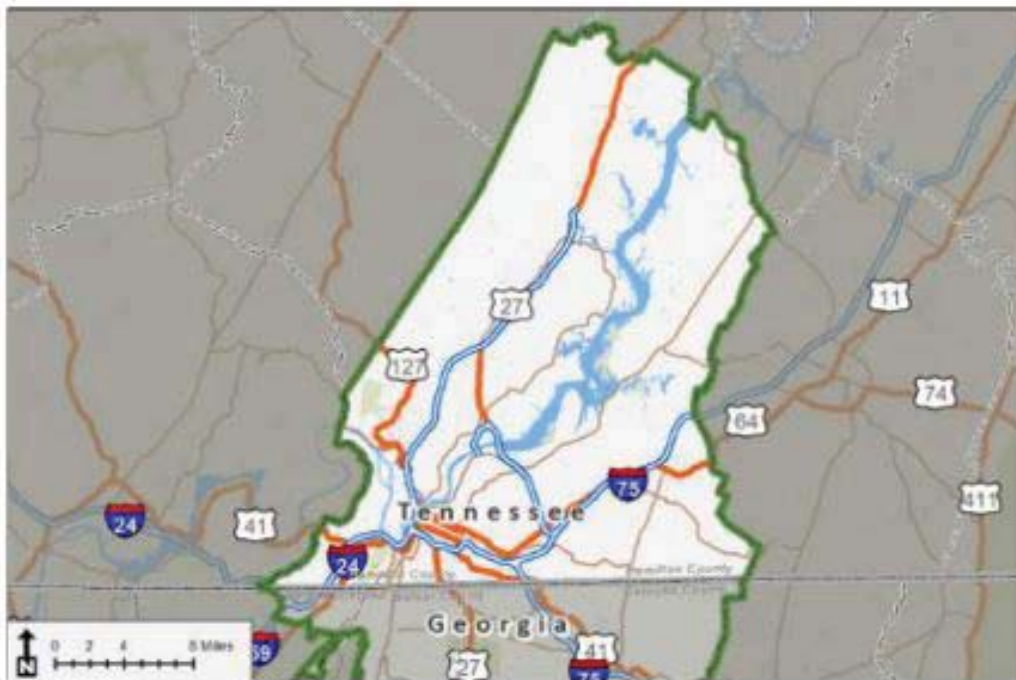
NEW

Transportation Improvement Program Fiscal Years 2017-2020

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County <input type="text" value="Hamilton"/>	Length <input type="text" value="N/A"/> mi	LRTP # <input type="text" value="Consistent with pp 146"/>			
Route / Project Name <input type="text" value="National Highway Performance Program Grouping"/>			Total Project Cost <input type="text" value="\$17,078,804"/>		
Termini / Intersection <input type="text" value="Chattanooga TPO"/>					
Project Description <input type="text" value="See Appendix F Grouping Description for a comprehensive listing of activities included but not limited for eligibility"/>					

Fiscal Year	Phase	Funding Type	Total Funds	Federal Funds	State Funds	Local Funds
2017	PE, ROW, CONST	NHPP	\$4,894,701	\$3,915,761	\$978,940	\$0
2018	PE, ROW, CONST	NHPP	\$6,394,701	\$5,115,761	\$1,278,940	\$0
2019	PE, ROW, CONST	NHPP	\$2,894,701	\$2,315,761	\$578,940	\$0
2020	PE, ROW, CONST	NHPP	\$2,894,701	\$2,315,761	\$578,940	\$0

Amendment	Date	Adjustment	Date	Remarks
Amendment 1	<input type="text"/>	Adjustment 1	3/21/2017	
Amendment 2	<input type="text"/>	Adjustment 2	2/8/2018	
Amendment 3	<input type="text"/>	Adjustment 3	<input type="text"/>	
Amendment 4	<input type="text"/>	Adjustment 4	<input type="text"/>	



Map is for illustrative purposes only and depicts conceptual project corridors and areas.

FY2017-2020 TIP: Chattanooga / Hamilton County / North Georgia Transportation Planning Organization



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Tennessee ES Office
446 Neal Street
Cookeville, Tennessee 38501



July 23, 2018

Mr. Brandon Chance
T.E.S.S. Advanced
Region 2 Project Development
Environmental Tech Office - Ecology
P.O. Box 22368
Chattanooga, Tennessee 37422

Subject: FWS# 18-CPA-0626. Proposed Interstate 24 bridge replacements at Germantown Road and Belvoir Avenue; PIN# 124069.00, P.E. 33003-0166-44, Hamilton County, Tennessee.

Dear Mr. Chance:

Thank you for your letter dated June 28, 2018, transmitting bat survey results for the proposed Interstate 24 bridge replacements at Germantown Road and Belvoir Avenue in Hamilton County, Tennessee. The Tennessee Department of Transportation (TDOT) has determined that the project is "not likely to adversely affect" the federally endangered Indiana bat (*Myotis sodalis*) or threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*) based on negative survey results. Personnel of the U.S. Fish and Wildlife Service have reviewed the subject proposal and offer the following comments.

A mist netting survey was performed in May 23 and May 24, 2018, at one site determined to be a suitable netting location. Efforts resulted in no bat captures. Due to negative survey results for the Indiana bat and NLEB, we concur with TDOT's determinations of "not likely to adversely affect" for these species. This survey will be valid until April 1, 2024.

We are not aware of any other federally listed or proposed species that would be impacted by the project. Therefore, based on the best information available at this time, we believe that the requirements of section 7 of the Endangered Species Act (Act) of 1973, as amended, are fulfilled for all species that currently receive protection under the Act. Obligations under section 7 of the Act should be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

If you have any questions regarding our comments, please contact John Griffith at 931/525-4995 or by email at john_griffith@fws.gov.

Sincerely,

Michael Gale
Field Supervisor (Acting)

xc: Vincent Pontello, TWRA, Crossville, TN

Tennessee Wildlife Resource Agency Coordination

From: [Vincent Pontello](#)
To: [Rob Howard](#)
Cc: [Rob Todd](#); [K.Brandon Chance](#)
Subject: Re: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd PIN 124069.00 - TWRA Coordination Request
Date: Monday, April 16, 2018 4:02:15 PM
Attachments: [image001.png](#)

Rob,

Thank you for the opportunity to review this project. My data concur with the information you have sent me. I do not have specific specie request for this project. The implementation of BMPs will be sufficient to satisfy the needs of the TWRA. Please contact me if you need further assistance.

Vincent L. Pontello
Wildlife Biologist
Liaison to Federal Highway Admin. & TDOT
Tennessee Wildlife Resources Agency
Environmental Services Division

From: Rob Howard
Sent: Tuesday, March 20, 2018 9:36:22 AM
To: Vincent Pontello
Cc: Rob Todd; Scott Medlin; Chester Sutherland; K.Brandon Chance; Colby Mann
Subject: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd PIN 124069.00 - TWRA Coordination Request

Vince,

TDOT proposes to replace two (2) existing bridges at I-24 at Belvoir Rd and I-24 at Germantown Rd. A Functional Plan with the marked Area of Influence is provided for your review. A more detailed plan set will be sent when available.

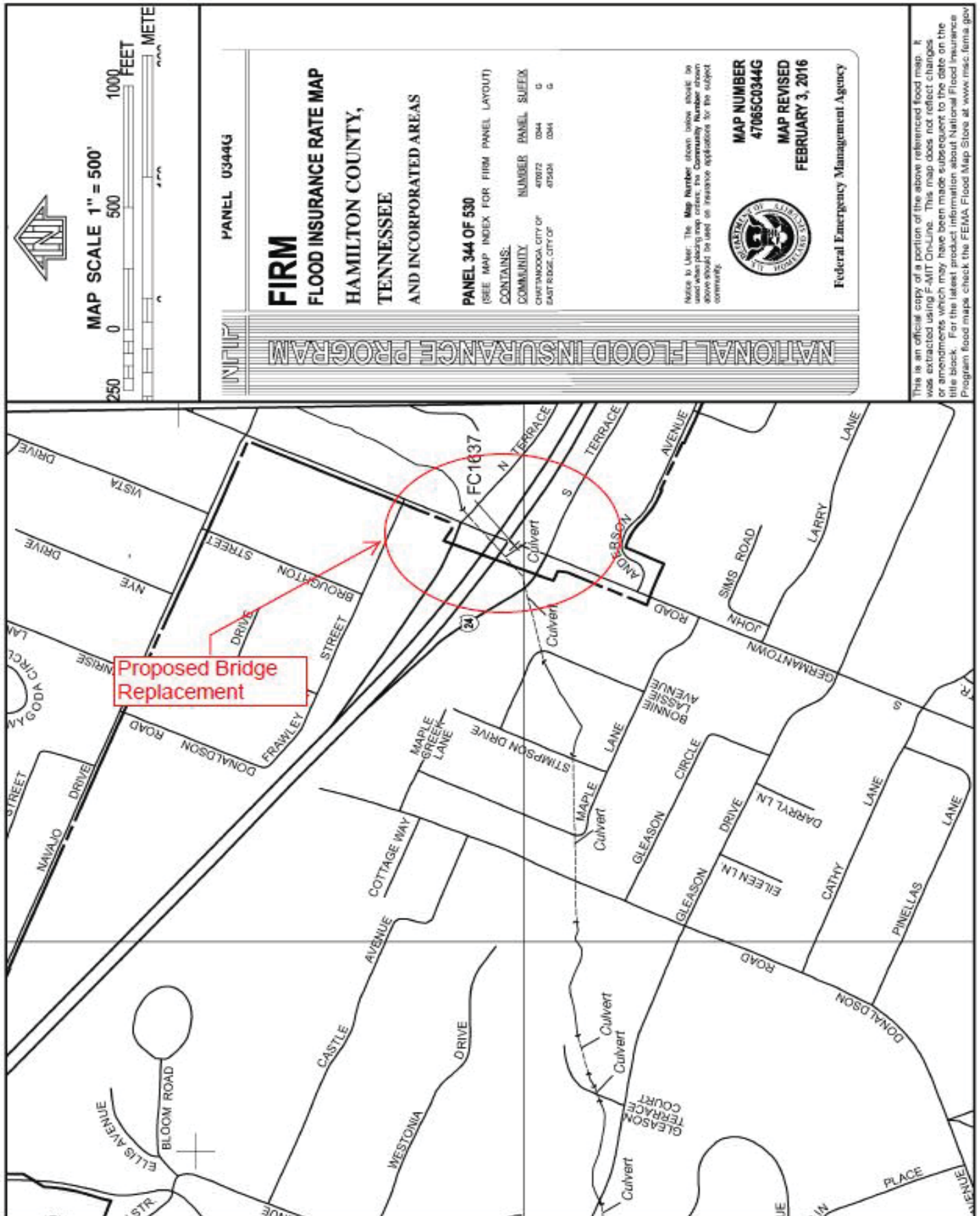
Also attached for your use are project location maps, project plans, a Google Earth kml file, a Species Review Map and list of protected species from the TDEC- Division of Natural Heritage (DNH) database. Photo IMG 2705 shows Belvoir Rd Bridge over I-24. Photo IMG 2711 shows I-24 over Germantown Rd.

TDOT's Region 2 Environmental Tech Office is tasked with reviewing the project information and completing ecological studies for water resources, suitable habitat and protected species concerns. I would appreciate your review and comment related to protected species.

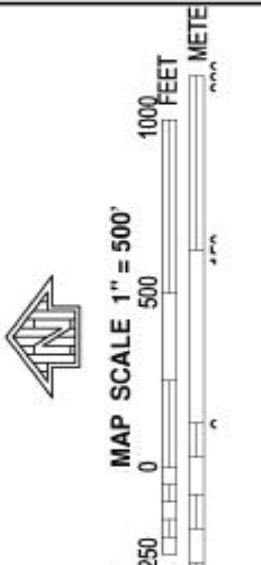
Your assistance in the preparation of this project is greatly appreciated. Please contact me with any questions at rob.howard@tn.gov or 931.520.2412.

Respectfully,

Floodplain Map



This is an official copy of a portion of the above referenced flood map. It was extracted using F-40IT Ch-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov




FIRM
FLOOD INSURANCE RATE MAP
HAMILTON COUNTY,
TENNESSEE
AND INCORPORATED AREAS

PANEL 363 OF 430
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

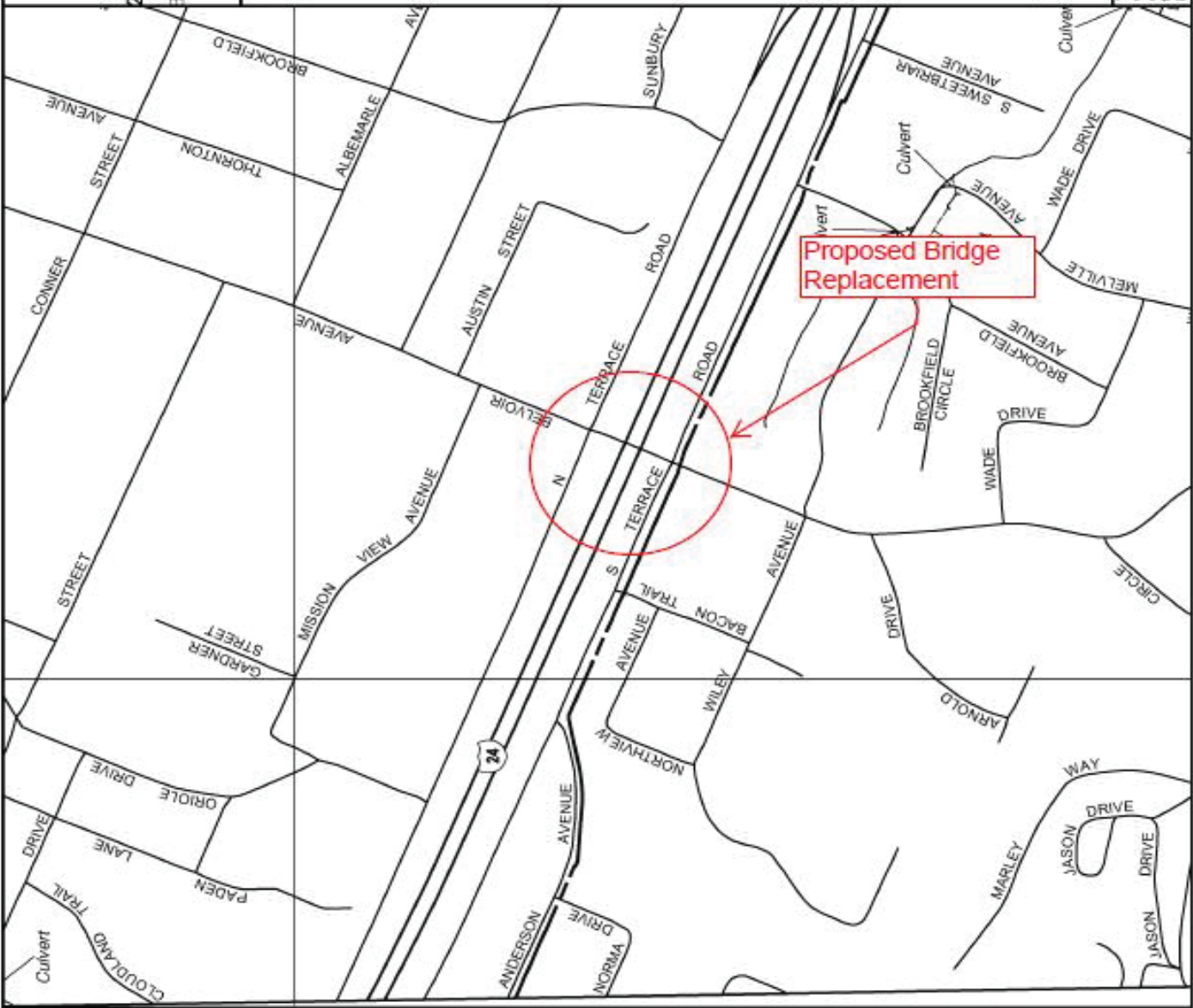
CONTAINS:

COMMUNITY	MEMBER	PANEL	SUFFIX
CHATTANOOGA, CITY OF	470623	0083	G
EAST ROGUE, CITY OF	470424	0083	G
ROSELAND, CITY OF	470319	0083	G

MAP NUMBER
47065C0363G
MAP REVISED
FEBRUARY 3, 2016


Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



Technical Appendices

Programmatic Categorical Exclusion

Interstate 24 (I-24)

Bridges at Germantown Road, Log Mile (LM) 12.08 and Belvoir Avenue, LM 12.59

East Ridge

Hamilton County

PIN 124069.00

Project Development

TRANSPORTATION INVESTMENT REPORT

Special Bridge Replacement Program

Hamilton County / City of Chattanooga / City of East Ridge
PIN 124069.00

Interstate 24 Bridge
over South Germantown Road
Bridge ID: 33I00240055
Log Mile: 12.08

Belvoir Avenue Bridge
over Interstate 24
Bridge ID: 33I00240057
Log Mile: 1.01






PREPARED BY
BARGE DESIGN SOLUTIONS

For the

TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION

Approved by:  Date 7-10-18
Deputy Commissioner Chief of Environment and Planning

Approved by:  Date 7/16/18
Deputy Commissioner and Chief Engineer

Approved by:	Signature	DATE
Transportation Director Strategic Transportation Investments Division		6-20-18
Engineering Director Design Division		6-20-18
Engineering Director Structures Division		6/20/18

This document is covered by 23 USC § 409 and its production pursuant to fulfilling public planning requirements does not waive the provisions of § 409.

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Project Description

The Construction Manager/General Contractor (CM/GC) project on Interstate 24 in Hamilton County includes the Interstate 24 bridge over South Germantown Road and the Belvoir Avenue Bridge over Interstate 24. The proposed project includes the design and construction of the bridge replacement for both bridges. Accelerated Bridge Construction (ABC) techniques will be used to minimize impacts on vehicular traffic.

The purpose of this study is to review the existing structures and evaluate the recommended improvements. The proposed actions under consideration are as follows:

Interstate 24 Bridge over South Germantown Road

- Existing structure is four (4) span concrete bridge that is 166 feet long with eight (8) foot interior shoulders, three (3) twelve (12) foot lanes, and a three (3) foot outside shoulder in each direction.
- Proposed structure will either be a four (4) span concrete or two (2) span steel bridge that is 166 feet long with eight (8) foot interior shoulders, three (3) twelve (12) foot lanes, and a twelve (12) foot outside shoulder in each direction.
- The substructure will be designed and built to accommodate future roadway widening along Interstate 24.
- Proposed phased construction plan.
- Four (4) separate cost estimates were prepared for this bridge based on various construction alternates.
- Widening of eastbound exit ramp for Interstate 24 to South Germantown Road.
- Both intersections at the interchange will be updated to meet current signal and Americans with Disabilities Act (ADA) design standards.

Belvoir Avenue Bridge over Interstate 24

- Existing structure is four (4) span concrete bridge that is 190.5 feet long with ten (10) foot shoulders, four (4) twelve (12) foot lanes, and five (5) sidewalks on each side.
- Proposed structure will be a two (2) span bridge that is 152 feet long with four (4) eleven (11) foot lanes, two (2) foot shoulders, six (6) inch curbs, six (6) foot sidewalks on each side, and retaining walls beneath the bridge to accommodate for Interstate 24 being widened in the future.
- Local traffic will need to be detoured during construction.
- One cost estimate was prepared for this bridge.
- Both intersections on either side of the bridge will be updated to meet current signal and Americans with Disabilities Act (ADA) design standards.

Proposed Alternates

For the study, multiple build alternates were evaluated for proposed projects. The various costs associated with each build alternate was also assessed.

Build Alternates

The exact method of construction for each bridge has yet to be determined. For the purpose of this study, a few alternates were considered and evaluated.

Interstate 24 Bridge over South Germantown Road

There are multiple options for construction, bridge phase, and traffic phasing that have been evaluated for feasibility for the Interstate 24 Bridge over South Germantown Road. Accelerated Bridge Construction (ABC) techniques will be used to minimize impacts on vehicular traffic. The allowable configurations of the various categories can be seen in the following table.

Construction Alternates		Bridge Alternates	Traffic Phasing Plans
Concrete Bridge	<i>Baseline</i>	Alternate 1	<i>Road Closure (Detour to Next Ramp) Road Closure (Temporary Ramp)</i>
	<i>Accelerated Bridge Construction</i>	Alternate 2	<i>Slide (Traffic Out then In)</i>
Steel Bridge- Lateral Slide		Alternate 3	<i>Road Closure (Detour to Next Ramp) Road Closure (Temporary Ramp) Slide (Traffic South then North)</i>
Steel Bridge - SPMT		Alternate 4	<i>Road Closure (Detour to Next Ramp) Road Closure (Temporary Ramp)</i>

Belvoir Avenue Bridge over Interstate 24

At this time, there are no plans to use ABC techniques to build the Belvoir Avenue bridge over Interstate 24. It will be built using traditional construction, and traffic will be detoured to local roads while the bridge is closed to traffic for construction.

Cost Alternates

The build alternates allow for a “best” to “worst” case scenario regarding days under construction and probable construction costs. This type of cost analysis gives a broader analysis in regard to cost comparison. A comparison of the cost estimates can be seen in the following tables.

Interstate 24 Bridge over South Germantown Road	Cost (Millions)
BASELINE: TRADITIONAL CONSTRUCTION <i>Utilizing Traditional Techniques for Precast Concrete Box Beams and Cast-in-Place Deck</i>	\$7.86
ALTERNATE 1: ACCELERATED BRIDGE CONSTRUCTION <i>Utilizing ABC Techniques for Precast Concrete Box Beams and Full Depth Deck Panels</i>	\$13.15
ALTERNATE 2: ACCELERATED BRIDGE CONSTRUCTION <i>Utilizing ABC Techniques for Lateral Slide Steel Bridge</i>	\$19.34
ALTERNATE 3: ACCELERATED BRIDGE CONSTRUCTION <i>Utilizing ABC Techniques for Steel Bridge SPMT move</i>	\$17.12

<i>Belvoir Avenue Bridge over Interstate 24</i>	<i>Cost (Millions)</i>
<i>BASELINE: TRADITIONAL CONSTRUCTION</i>	\$5.13

The total estimated construction cost for all construction alternatives are detailed in Attachment B for each section.

Alternative Contracting

The chosen contracting method for the project is CM/GC (Construction Manager/General Contractor). This contracting method involves a contractor in not only the construction phase of a project but also the design phase. The goal of the partnership between the client, the designer, and the contractor are to reduce risk, improve construction schedule, streamline the design process, and develop a project that keeps to budget. All design decisions are subject to change until the contractor is officially on board.

Index Of Sheets

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2-3	TYPICAL SECTIONS
4	AREA OF INFLUENCE
5-6	PROPOSED LAYOUTS
5A-5D	TRAFFIC CONTROL PLANS
6A	DETOUR MAP
7-10	1-24 BRIDGE PHASING PLANS

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING

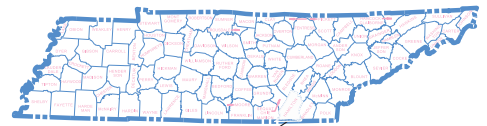
HAMILTON COUNTY

I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT

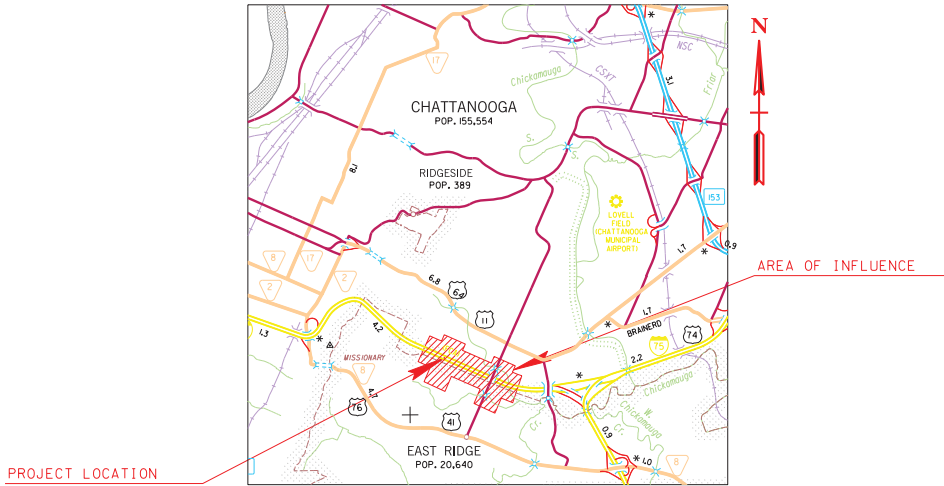
TRANSPORTATION INVESTMENT REPORT

F.A.H.S. NO. 10024

TENN.	YEAR	SHEET NO.
	2018	01
PRJ NO.		124066.00
STATE PROJ. NO.		BR-1-24-(397)



HAMILTON COUNTY
BRIDGE ID. # 33100240055 & 33100240057

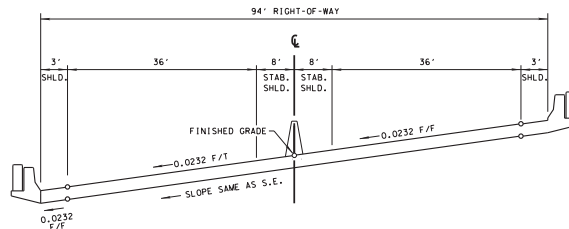


PROJECT LOCATION

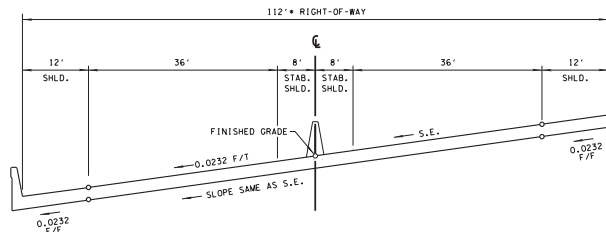
AREA OF INFLUENCE

N.T.S.

TYPE	YEAR	COUNTY	SHEET NO.
BRIDGE	2018	HAMILTON	02



EXISTING SECTION - INTERSTATE 24
(BASED ON STD. DWG. RD01-TS-5B)



PROPOSED SECTION - INTERSTATE 24
(BASED ON STD. DWG. RD01-TS-5B)

*EXISTING INSIDE SHOULDER WIDTH IS 8'.
NEW TDOT STANDARDS CALL FOR 12' MINIMUM SHOULDERS.

TRANSPORTATION INVESTMENT REPORT

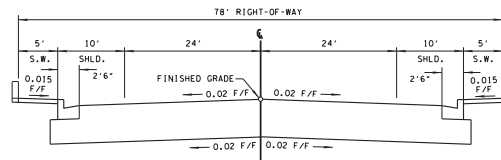
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY

STATE OF TENNESSEE
DEPARTMENT OF
TRANSPORTATION

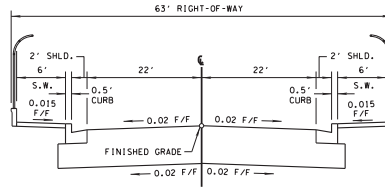
I-24 BRIDGE OVER
S GERMANTOWN RD

TYPICAL SECTIONS

TYPE	YEAR	COUNTY	SHEET NO.
BRIDGE	2018	HAMILTON	03



EXISTING SECTION - BELVOIR AVENUE
(BASED ON STD. DWG. RD01-TS-6)



PROPOSED SECTION - BELVOIR AVENUE
(BASED ON STD. DWG. RD01-TS-6A)

TRANSPORTATION INVESTMENT REPORT
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY

STATE OF TENNESSEE
DEPARTMENT OF
TRANSPORTATION

BELVOIR AVE
BRIDGE OVER I-24

TYPICAL SECTIONS

TYPE	YEAR	COUNTY	SHEET NO.
BRIDGE	2018	HAMILTON	04



PROJECT NUMBERS:
 PIN PROJECT #: 124069.00
 STATE PROJECT #: BR-I-24-3(97)

6/25/2018 \\cpr\share\ent\GIS\BIP\06118\180730\73070004_CAD\TENS\GERMANTOWN RD\Roadway\337300_04_Area of Influence.dgn



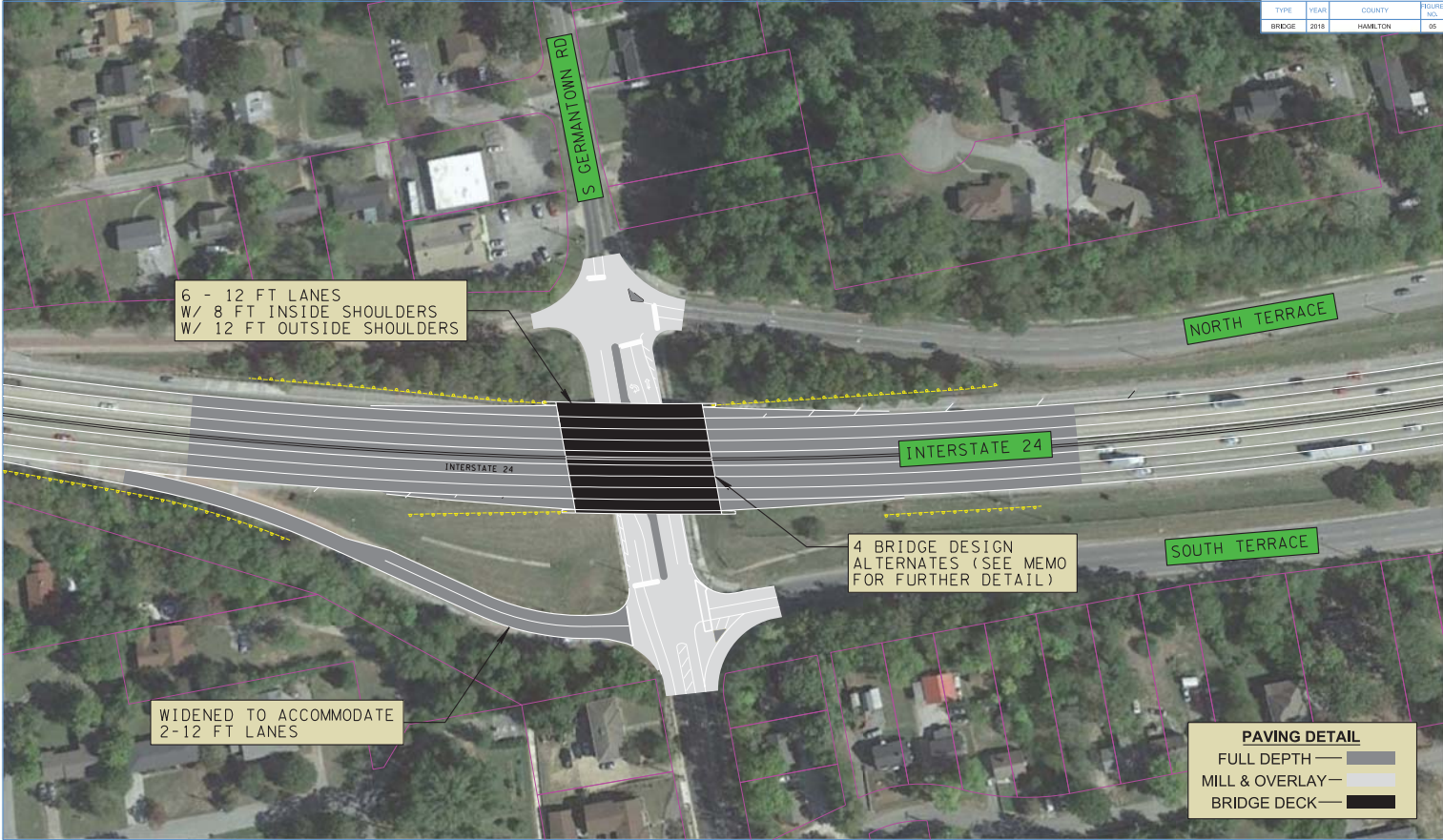
TRANSPORTATION INVESTMENT REPORT

PIN 124069.00
 I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
 HAMILTON COUNTY

STATE OF TENNESSEE
 DEPARTMENT OF
 TRANSPORTATION

AREA OF
 INFLUENCE MAP

TYPE	YEAR	COUNTY	FIGURE NO.
BRIDGE	2018	HAMILTON	05



6/25/2018 \\c:\p\bar\c\m\ham\p\06\1\18\167\0367\00004_CAD\TENS\GERMANTOWN RD\ROADWAY\1673700_05_Proposal.dwg

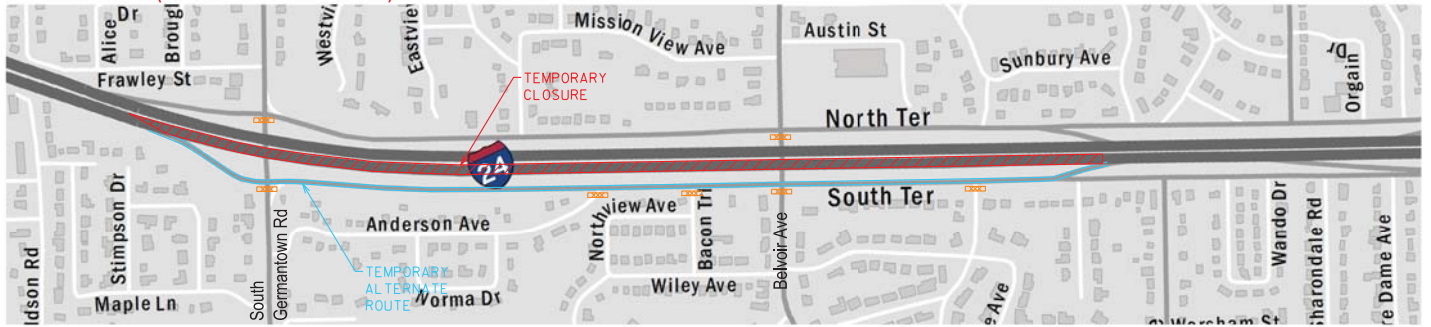


TRANSPORTATION INVESTMENT REPORT
 PIN 124069.00
 I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
 HAMILTON COUNTY

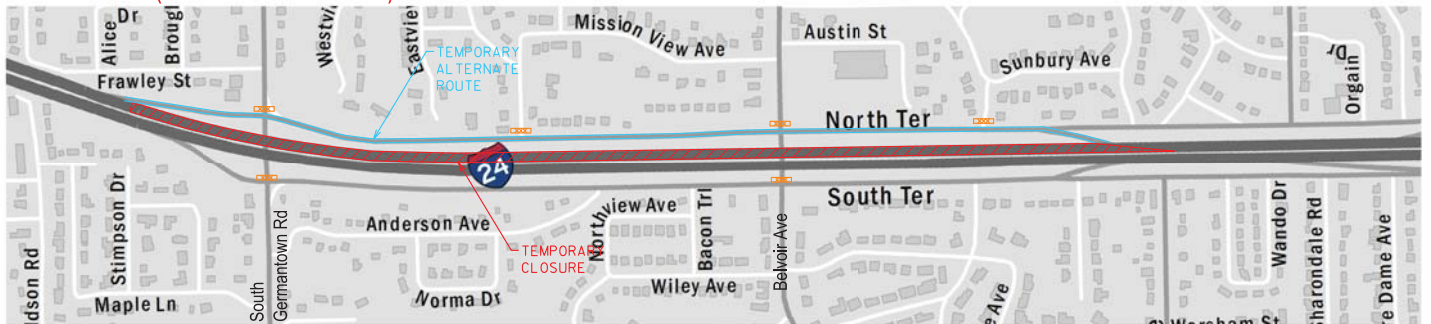
STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION
I-24 BRIDGE OVER S GERMANTOWN RD
PROPOSED LAYOUT

TYPE	YEAR	COUNTY	SHEET NO.
BRIDGE	2018	HAMILTON	05A

ROAD CLOSURE (DETOUR TO NEXT RAMP) - PHASE I



ROAD CLOSURE (DETOUR TO NEXT RAMP) - PHASE II



6/25/2018
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TRANSPORTATION INVESTMENT REPORT

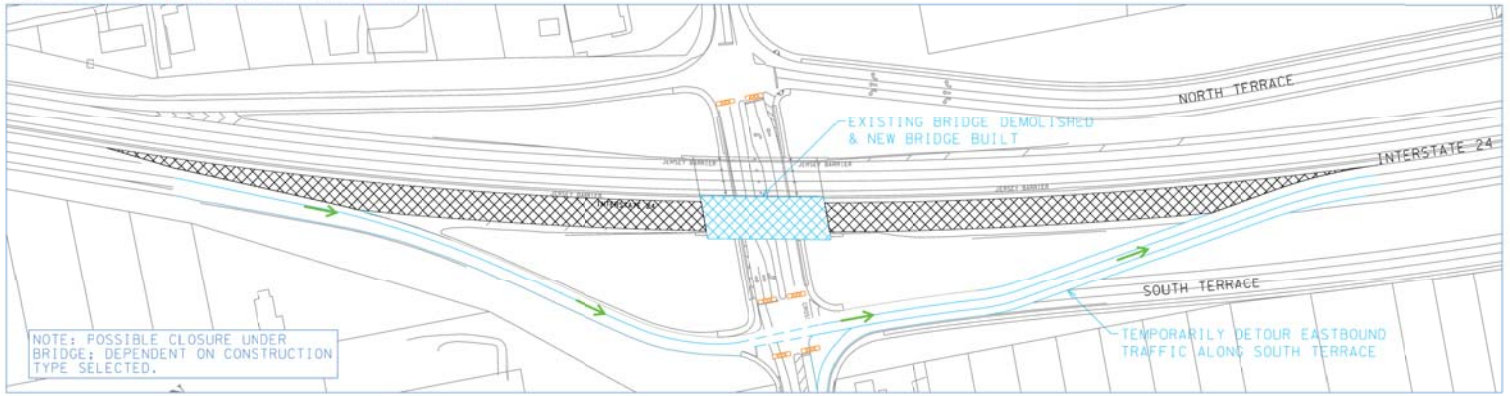
PIN 124069.00
 I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
 HAMILTON COUNTY

STATE OF TENNESSEE
 DEPARTMENT OF
 TRANSPORTATION

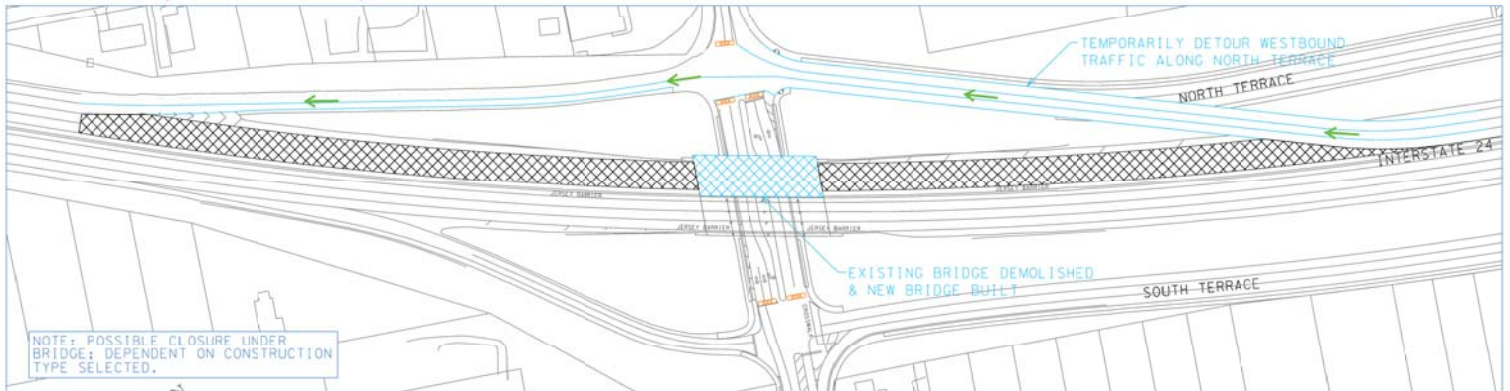
I-24 BRIDGE OVER
 S GERMANTOWN RD
 TRAFFIC CONTROL -
 CLOSURE 1

TYPE	YEAR	COUNTY	FORM NO.
BRIDGE	2018	HAMILTON	050

ROAD CLOSURE (TEMPORARY RAMP) - PHASE I



ROAD CLOSURE (TEMPORARY RAMP) - PHASE II



6/25/2018
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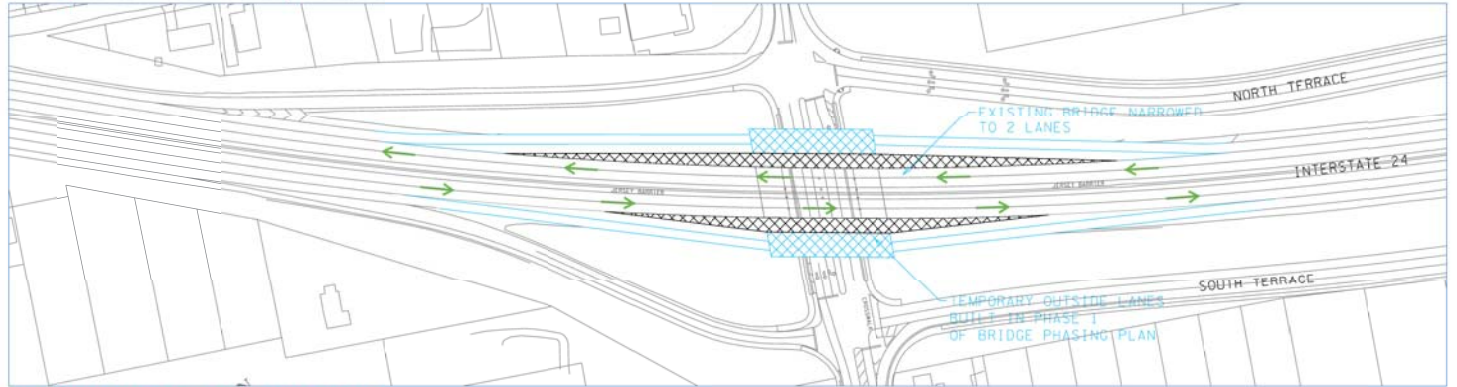


TRANSPORTATION INVESTMENT REPORT
 PIN 124069.00
 I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
 HAMILTON COUNTY

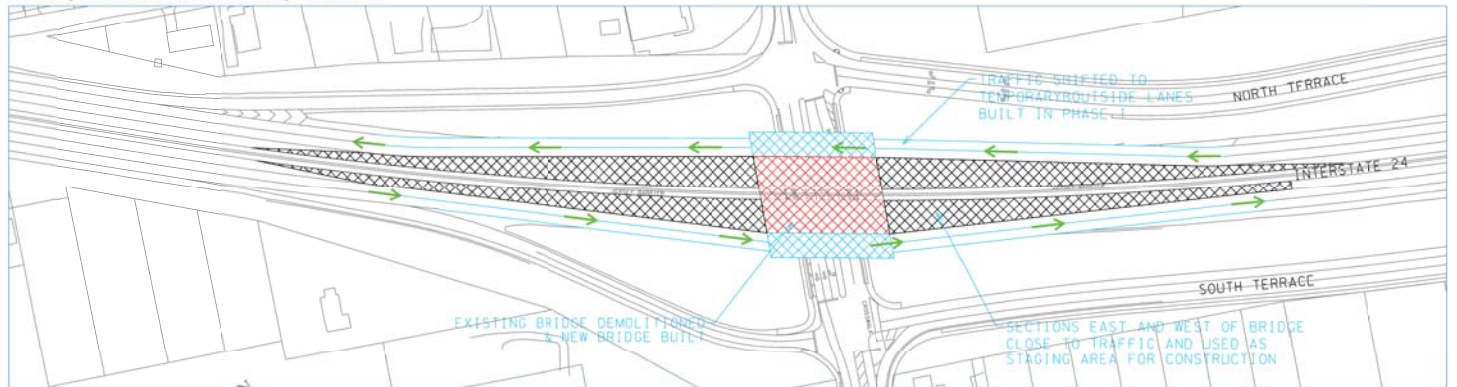
STATE OF TENNESSEE
 DEPARTMENT OF
 TRANSPORTATION
 I-24 BRIDGE OVER
 S GERMANTOWN RD
 TRAFFIC CONTROL -
 CLOSURE 2

TYPE	YEAR	COUNTY	ROUTE NO.
BRIDGE	2018	HAMILTON	05C

SLIDE (TRAFFIC OUT THEN IN) - PHASE I



SLIDE (TRAFFIC OUT THEN IN) - PHASE II



TRANSPORTATION INVESTMENT REPORT

PIN 124069.00
 I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
 HAMILTON COUNTY

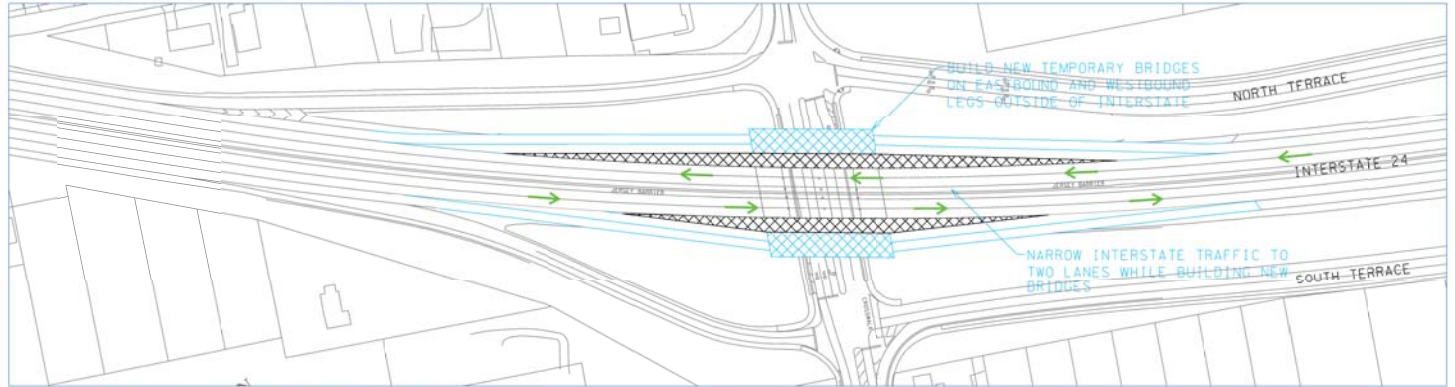
STATE OF TENNESSEE
 DEPARTMENT OF
 TRANSPORTATION

I-24 BRIDGE OVER
 S GERMANTOWN RD
 TRAFFIC CONTROL -
 SHIFT 1

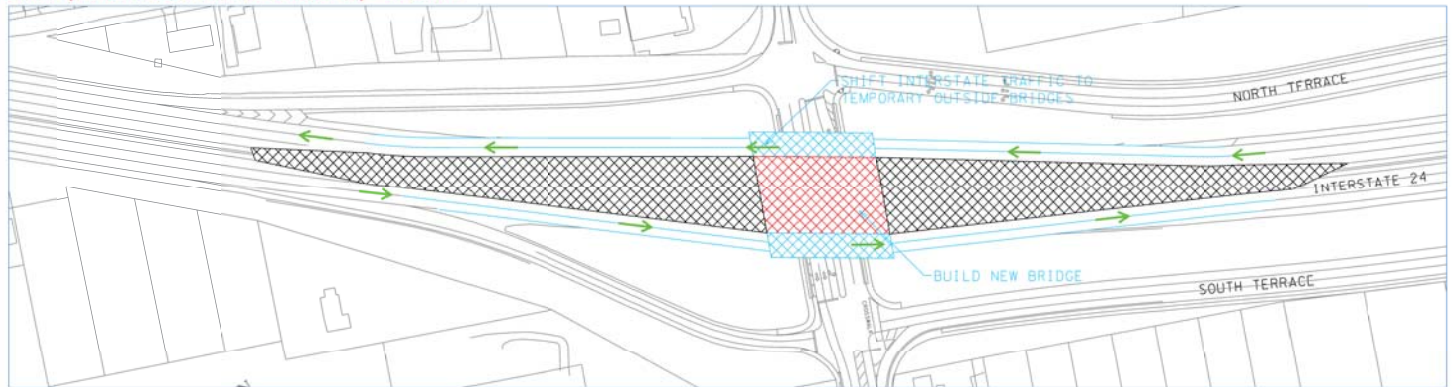


TYPE	YEAR	COUNTY	ROUTE NO.
BRIDGE	2018	HAMILTON	050

SLIDE (TRAFFIC NORTH THEN SOUTH) - PHASE I



SLIDE (TRAFFIC NORTH THEN SOUTH) - PHASE II



TRANSPORTATION INVESTMENT REPORT

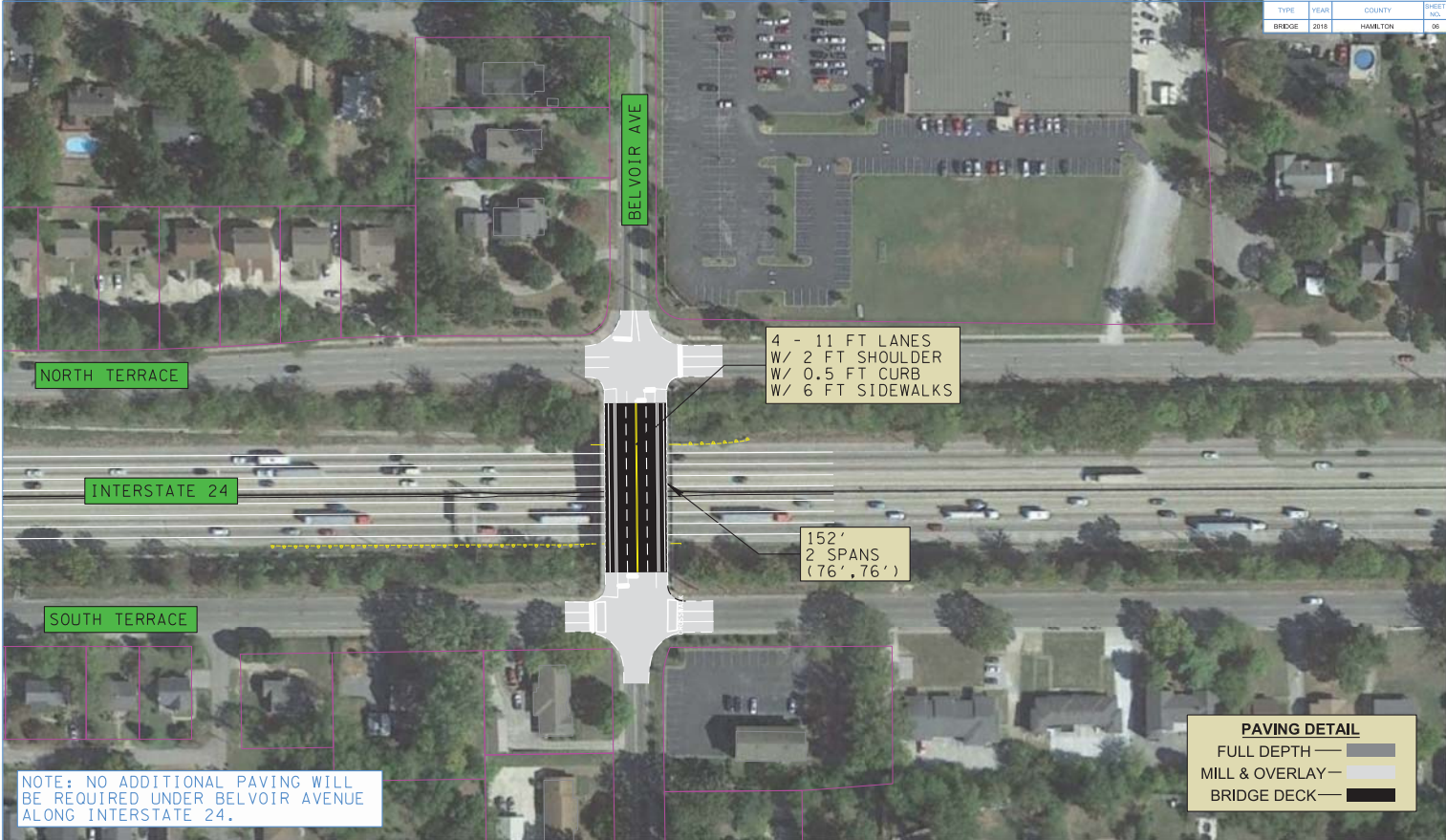
PIN 124069.00
 I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
 HAMILTON COUNTY

STATE OF TENNESSEE
 DEPARTMENT OF
 TRANSPORTATION

I-24 BRIDGE OVER
 S GERMANTOWN RD
 TRAFFIC CONTROL -
 SHIFT 2



TYPE	YEAR	COUNTY	SHEET NO.
BRIDGE	2018	HAMILTON	06



8/25/2018
 I:\proj\arcgis\GIS\Projects\180710\1807100004_CAD\TENS\GERMANTOWN RD\Roadway\180710_04_Proposed.dgn

NOTE: NO ADDITIONAL PAVING WILL BE REQUIRED UNDER BELVOIR AVENUE ALONG INTERSTATE 24.

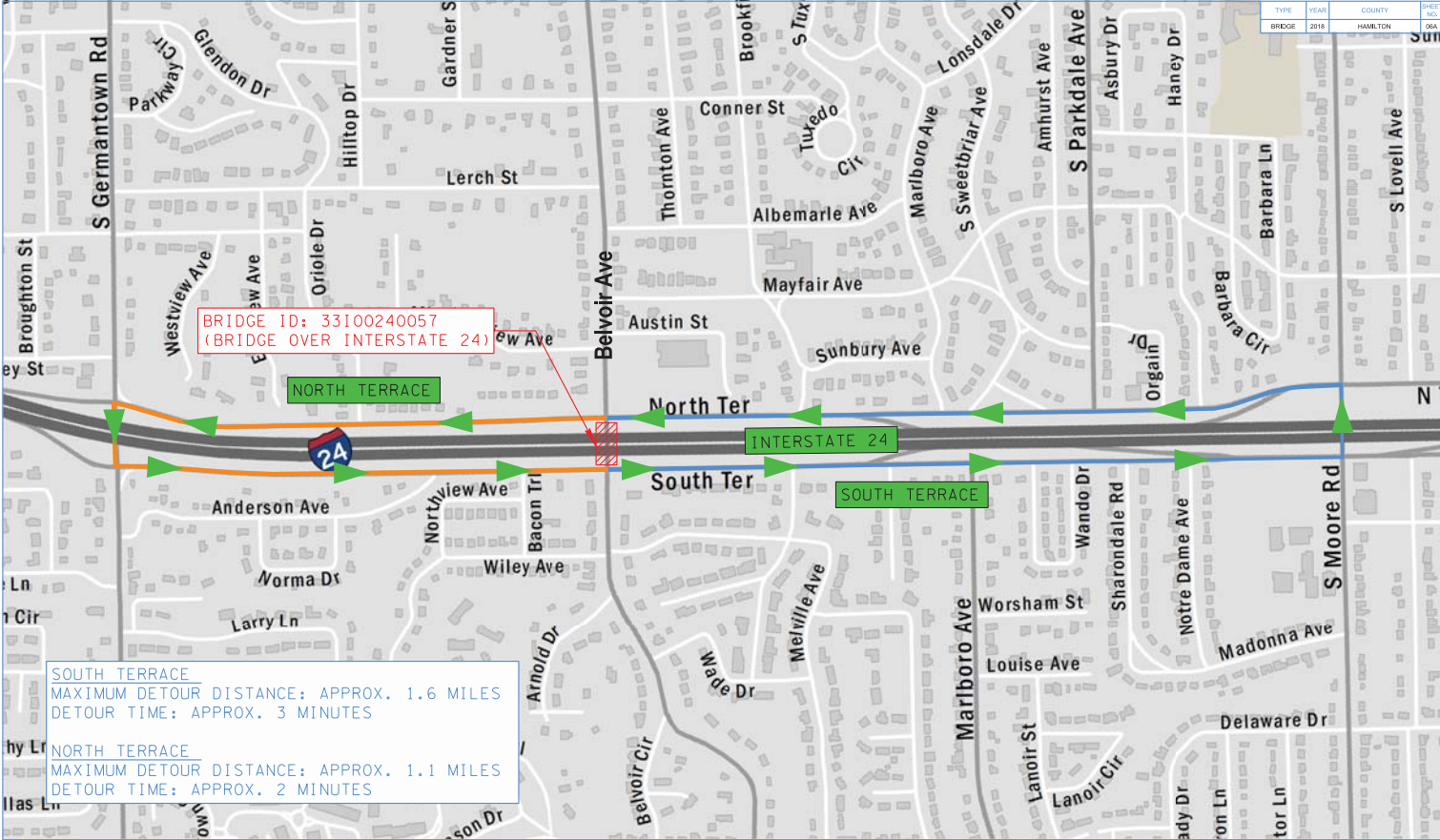
PAVING DETAIL	
FULL DEPTH	— [Dark Grey Box]
MILL & OVERLAY	— [Light Grey Box]
BRIDGE DECK	— [Black Box]



TRANSPORTATION INVESTMENT REPORT
 PIN 124069.00
 I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
 HAMILTON COUNTY

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION
BELVOIR AVE BRIDGE OVER I-24
PROPOSED LAYOUT

TYPE	YEAR	COUNTY	SHEET NO.
BRIDGE	2018	HAMILTON	500A



BRIDGE ID: 33100240057
(BRIDGE OVER INTERSTATE 24)

SOUTH TERRACE
 MAXIMUM DETOUR DISTANCE: APPROX. 1.6 MILES
 DETOUR TIME: APPROX. 3 MINUTES

NORTH TERRACE
 MAXIMUM DETOUR DISTANCE: APPROX. 1.1 MILES
 DETOUR TIME: APPROX. 2 MINUTES



TRANSPORTATION INVESTMENT REPORT
 PIN 124069.00
 I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
 HAMILTON COUNTY

STATE OF TENNESSEE
 DEPARTMENT OF
 TRANSPORTATION
 BELVOIR AVE
 BRIDGE OVER I-24
 DETOUR MAP

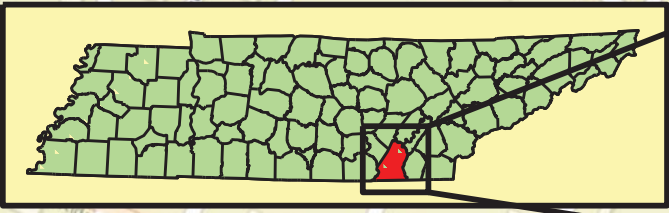
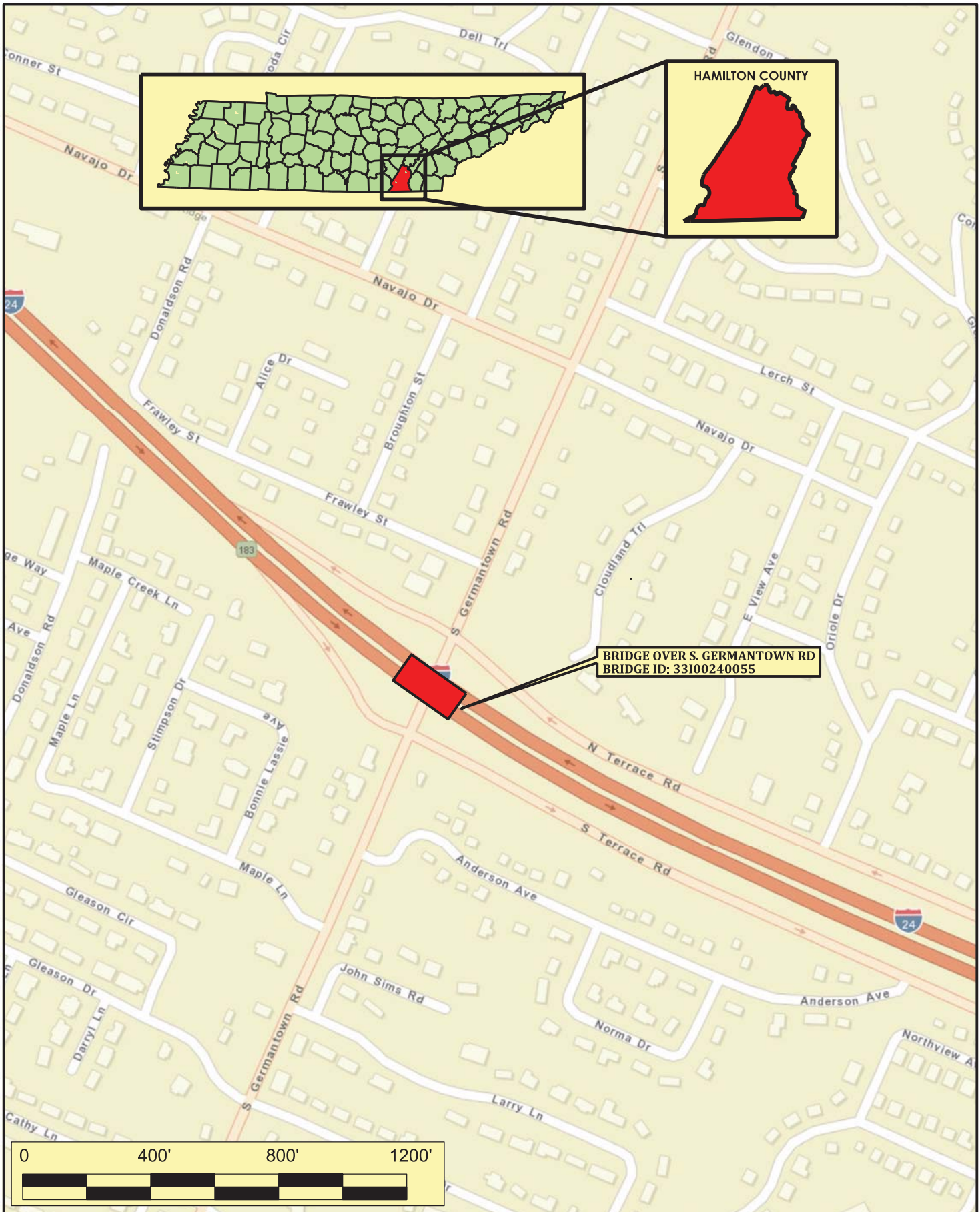
6/25/2018
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SECTION 1

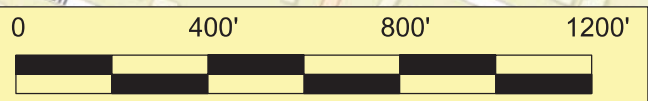
Interstate 24 Bridge over South Germantown Road

PIN 124069.00

Bridge ID: 33I00240055

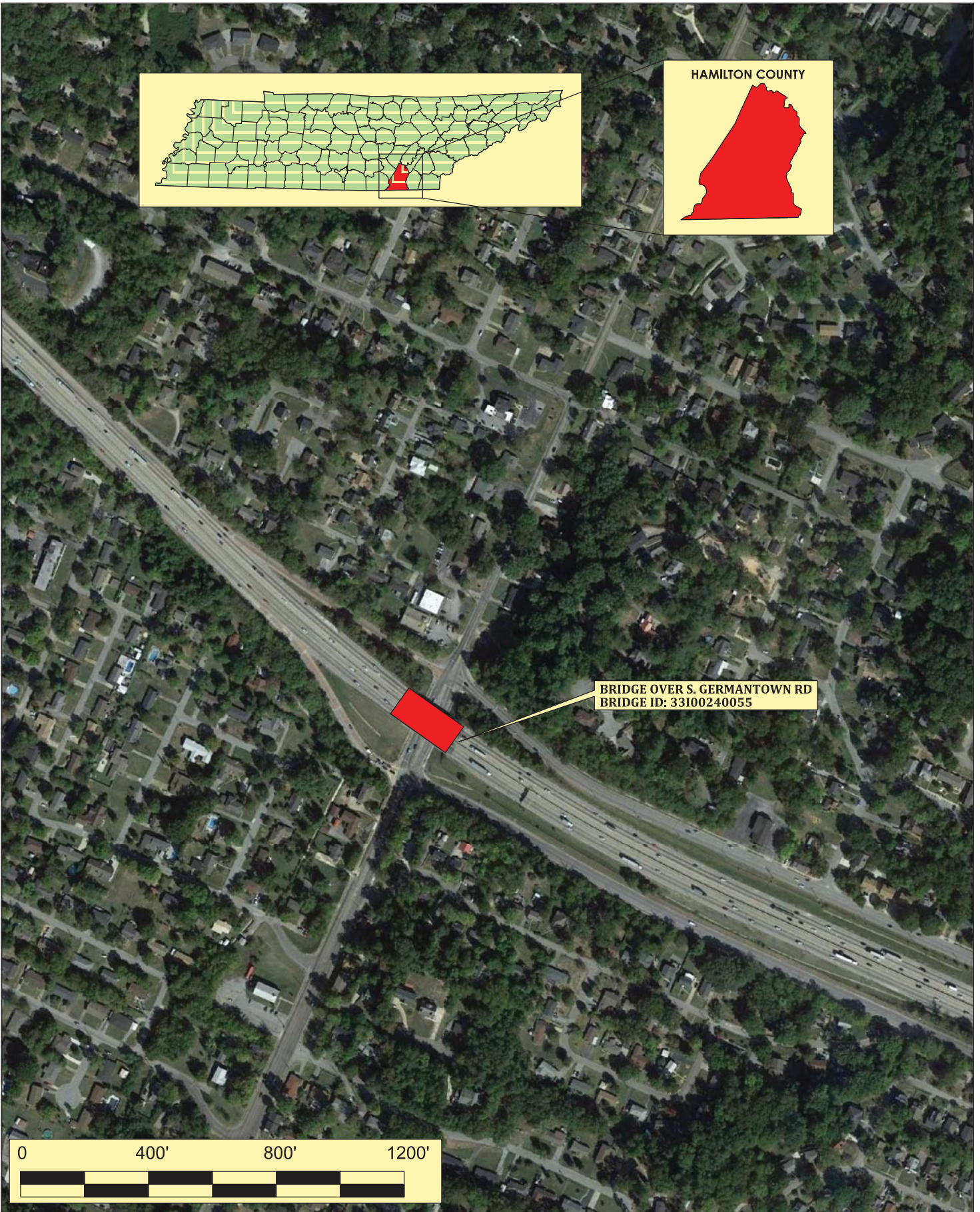


BRIDGE OVER S. GERMANTOWN RD
BRIDGE ID: 33100240055



AREA MAP
BRIDGE TIR
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY





HAMILTON COUNTY

BRIDGE OVER S. GERMANTOWN RD
BRIDGE ID: 33100240055

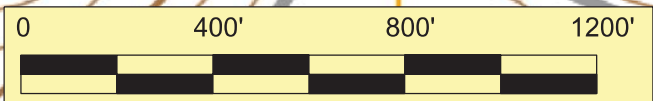
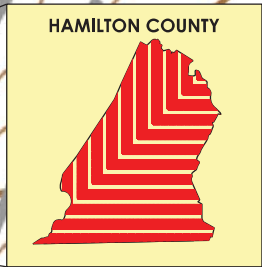
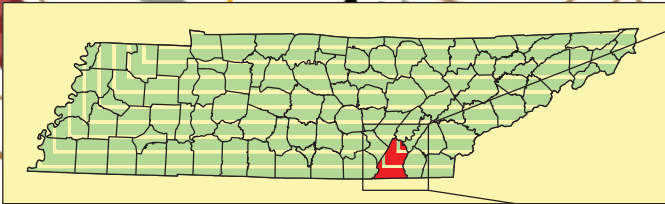
0 400' 800' 1200'



LOCATION MAP
BRIDGE TIR
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY



TDOT
Department of
Transportation



TOPOGRAPHIC MAP
 BRIDGE TIR
 PIN 124069.00
 I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
 HAMILTON COUNTY





STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION
SUITE 1000, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TN 37243
(615) 741-2208

JOHN C. SCHROER
COMMISSIONER

BILL HASLAM
GOVERNOR

MEMORANDUM

TO: Steve Allen, Transportation Director
Strategic Transportation Investments Division

FROM: Lia Obaid, Asst. Director of Construction
Construction Division

DATE: June 11, 2018

SUBJECT: TIR Field Review (Special Bridge Replacement Program)
Interstate 24 Bridge over South Germantown Road
Log Mile 12.08
Bridge ID: 33I00240055
Hamilton County
PIN 124069.00

A field review was held for the above-mentioned project on Thursday, April 5, 2018.

The existing structure is a four (4) span concrete bridge that is 166 feet long at a 79 degree skew with eight (8) foot interior shoulders, three (3) twelve (12) foot lanes, and a three (3) foot outside shoulder in each direction. The current right of way (R.O.W.) is 300 feet. The current posted speed on Interstate 24 is fifty-five (55) miles per hour. This structure crosses South Germantown Road in Hamilton County and is within Chattanooga city limits. The existing structure has an out-to-out width of 100 feet. The sufficiency rating of this bridge is 30.9 according to the last bridge inspection report. There exists a stream that is piped and runs diagonally below Interstate 24. The culvert will be assessed during the design phase to determine if replacement is necessary. This stream is not anticipated to be impacted by the project in question. The Q10, Q50, and Q100 are 154 cfs, 240 cfs and 284 cfs, respectively; these values were collected from Streamstats.

The proposed bridge will be designed to meet TDOT standard RD01-TS-5B. The substructure will be designed and built to accommodate future roadway widening along Interstate 24. The

PIN 124069.00
I-24 over S. Germantown Road CM/GC Project

proposed structure's centerline will match the existing. Laneage will likely be shifted to accommodate traffic as part of the phased construction. There are four (4) phasing plans that have been proposed for the bridge. Two (2) phasing plans include temporarily closing the structure and detouring traffic and two (2) of the phasing plans include shifting traffic. If traffic is shifted, the laneage will potentially need to narrow to two (2) lanes in each direction during certain parts of the construction phasing. For more information, see the functional plans at the beginning of the study. The route has a 2022 base year AADT of 114,670 vehicles per day and a 2042 design year AADT of 142,650 vehicles per day. A baseline alternative was proposed for the bridge utilizing traditional construction methods and was analyzed for cost comparison purposes, but it is the intention to construct the structure by Accelerated Bridge Construction (ABC) methods.

1. The baseline proposed structure is a four (4) span concrete cast-in-place box beam bridge that is 166 feet long and would be built using traditional construction methods.

There are three (3) Accelerated Bridge Construction (ABC) proposed alternates for the structure.

1. The proposed structure for the first accelerated bridge construction (ABC) alternate is a four (4) span concrete box beam bridge that is 166 feet long.
2. The second alternate proposes a two (2) span steel girder bridge that is 166 feet long to be constructed using the lateral slide method, which is an accelerated bridge construction (ABC) technique.
3. The third alternate also proposes a two (2) span steel girder bridge that is 166 feet long. However, construction of the bridge will utilize self-propelled modular transporter (SPMT), another accelerated bridge construction (ABC) technique.

The proposed alignment will remain for the replacement structure the same as the existing structure including the 79° skew. The proposed typical section for each alternate consists of eight (8) foot interior shoulders, three (3) twelve (12) foot lanes, and a twelve (12) foot outside shoulder in each direction. A design exception will be required due to the proposed eight (8) foot interior shoulder, as a minimum twelve (12) foot shoulder is currently required based on design standards. Eight (8) foot shoulders will limit the area of impact. No additional R.O.W. is anticipated. The posted speed is anticipated to remain 55 mph. The project will tie into the existing concrete pavement of Interstate 24. It is also estimated that overhead and underground utilities will need to be relocated.

Both intersections at the interchange will be updated to meet current signal and Americans with Disabilities Act (ADA) design standards.

The bridge has been selected for replacement utilizing the CM/GC (Construction Manager/General Contractor) Method for design phase and the ABC (Accelerated Bridge Construction) technique for the construction phase in an effort to minimize negative long-term traffic impacts during construction. At this time the design team is anticipating closing the South Germantown Road bridge to local traffic during the construction phase, but this is subject to change as the design phase continues. A preliminary detour map is attached. It is not the intention of the design team to have simultaneous lane closures and detours for both bridges. However, this analysis is also subject to change during the CM/GC design process. Once a CM

(Construction Manager) has been selected, the formal design process will begin and a final traffic control plan will be determined.

A total cost for the bridge replacement, including approach work, estimated replacement, and preliminary engineering, was conducted for each alternate. A man day estimate cannot be conducted until the CM (Construction Manager) is selected for the project.

Baseline:	\$ 7,856,000
Alternate #1:	\$ 13,150,000
Alternate #2:	\$ 19,338,000
Alternate #3:	\$ 17,117,000

ATTACHMENT 1-A

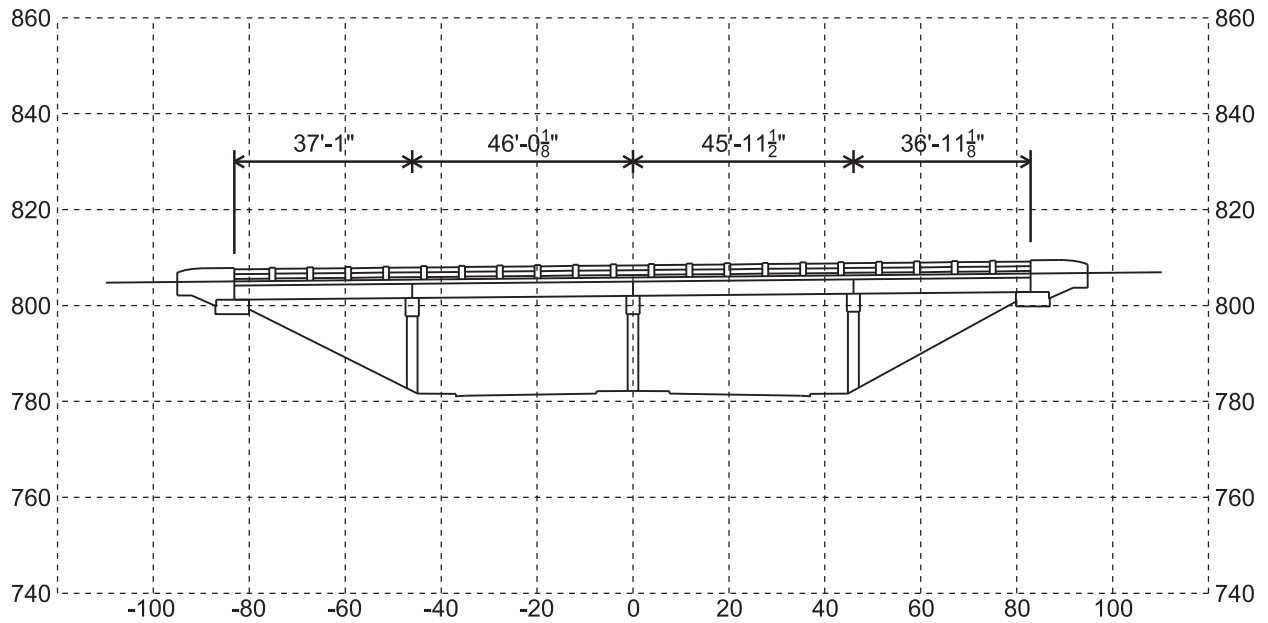
Bridge Figures

PIN 124069.00

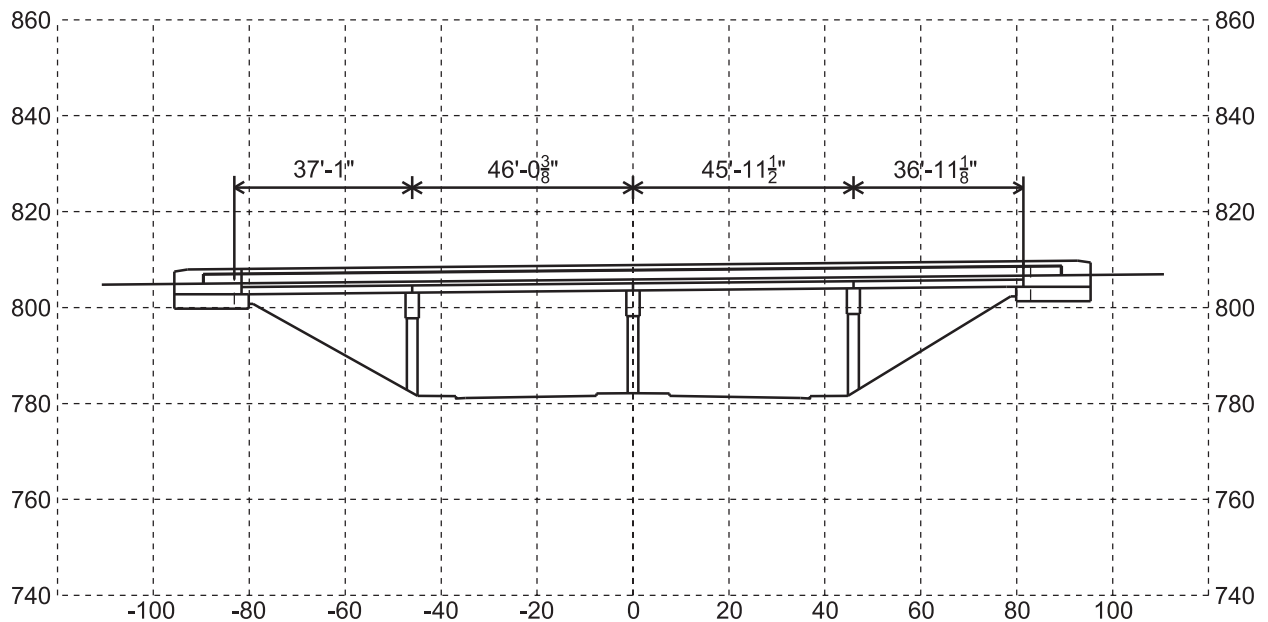
Bridge ID: 33100240055

INTERSTATE 24 BRIDGE OVER SOUTH GERMANTOWN ROAD

EXISTING STRUCTURE



PROPOSED STRUCTURE 4 SPAN PRECAST CONCRETE BOX BEAMS



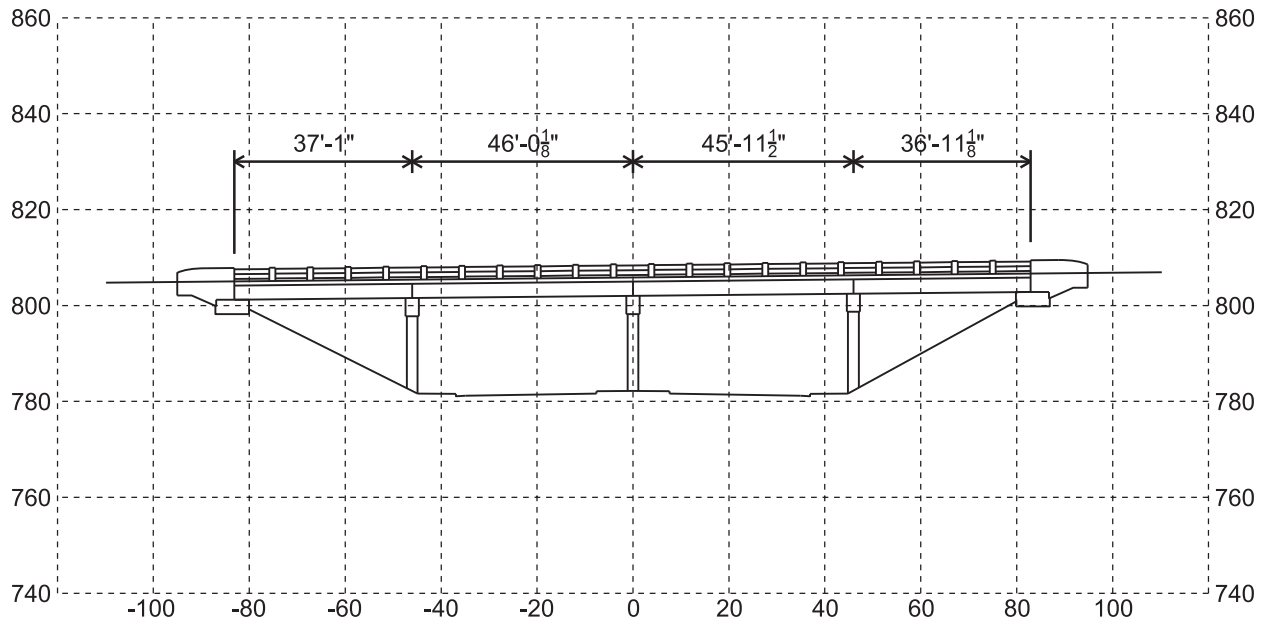
NOTE: PROPOSED BRIDGE NEEDS TO BE LENGTHENED TO ACCOMODATE FUTURE BIKE LANES SHOWN IN THE CITY OF CHATTANOOGA'S BIKE PLAN

PROFILE

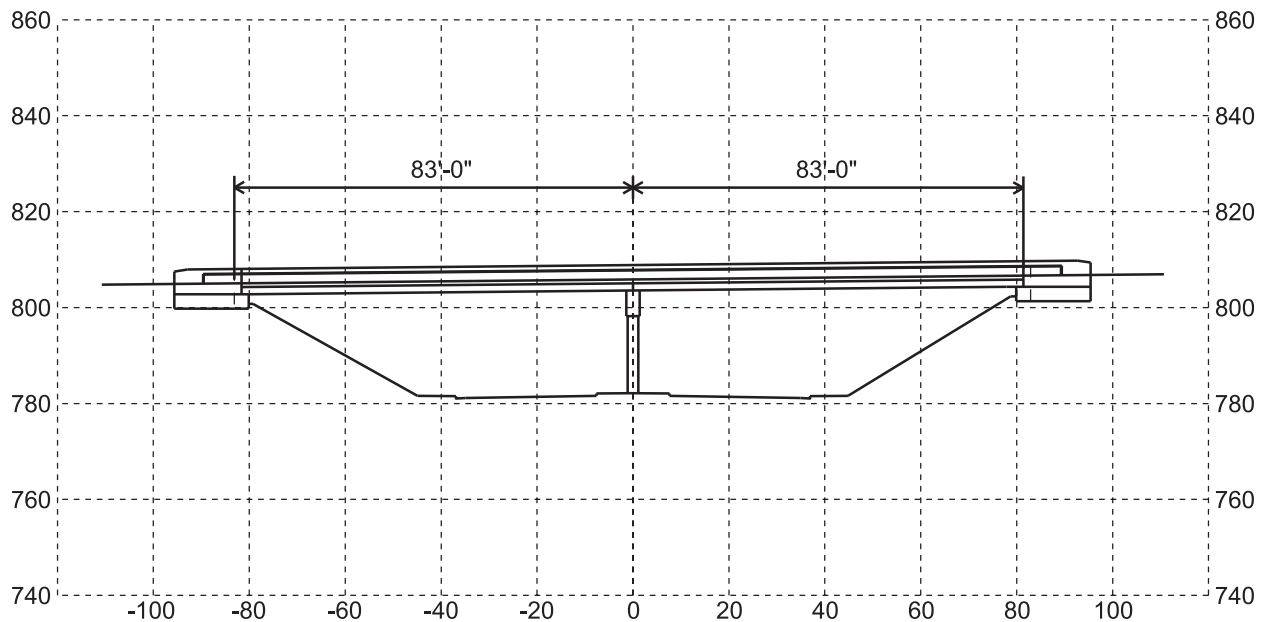
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY

INTERSTATE 24 BRIDGE OVER SOUTH GERMANTOWN ROAD

EXISTING STRUCTURE



PROPOSED STRUCTURE 2 SPAN STEEL



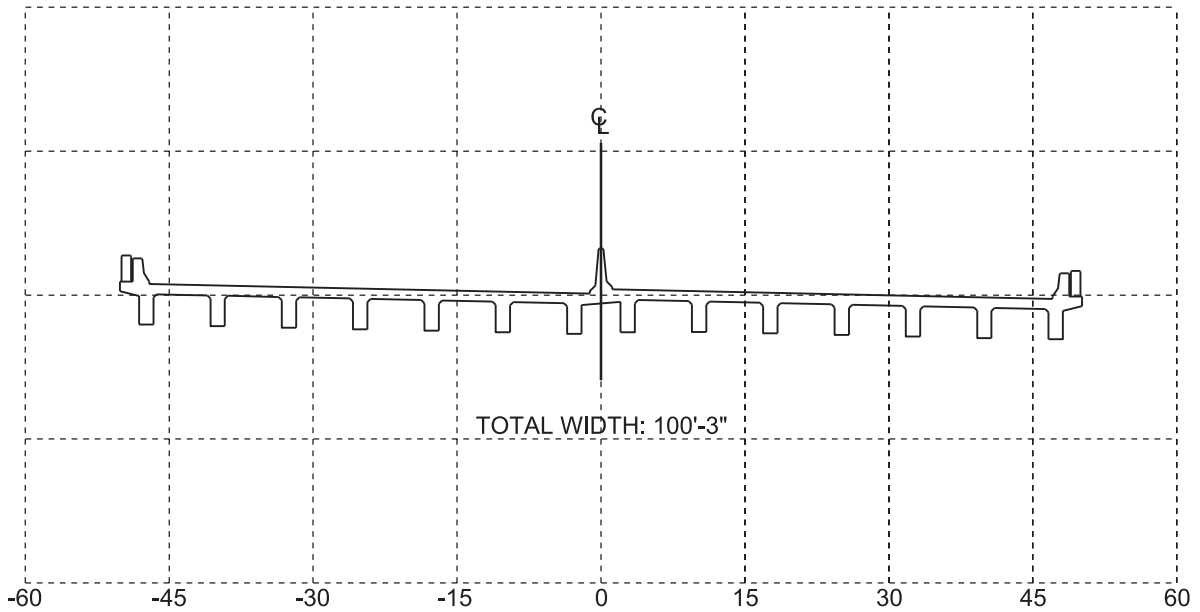
NOTE: PROPOSED BRIDGE NEEDS TO BE LENGTHENED TO ACCOMODATE FUTURE BIKE LANES SHOWN IN THE CITY OF CHATTANOOGA'S BIKE PLAN

PROFILE

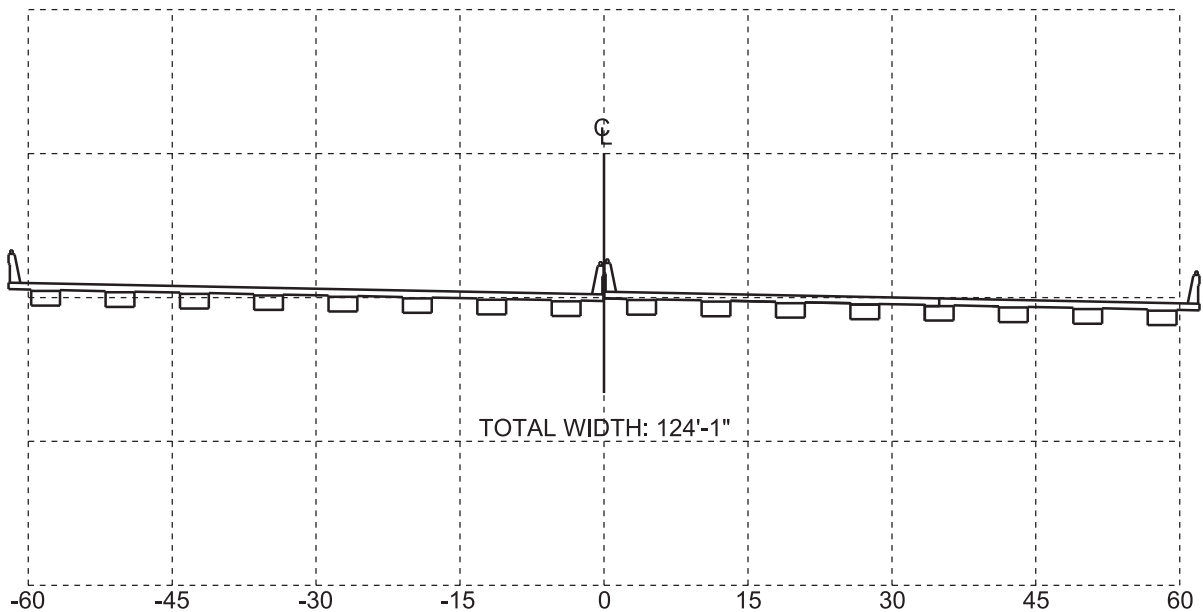
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY

INTERSTATE 24 BRIDGE OVER SOUTH GERMANTOWN ROAD

EXISTING STRUCTURE



PROPOSED STRUCTURE BASELINE: TRADITIONAL CONSTRUCTION - PCC BOX BEAMS

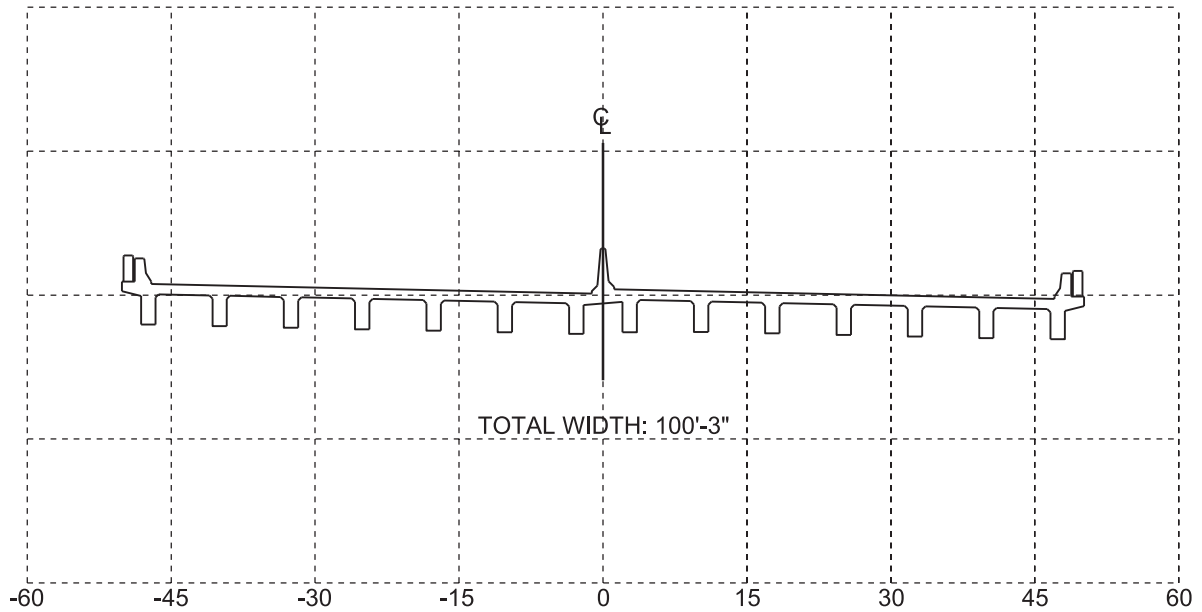


TYPICAL SECTION

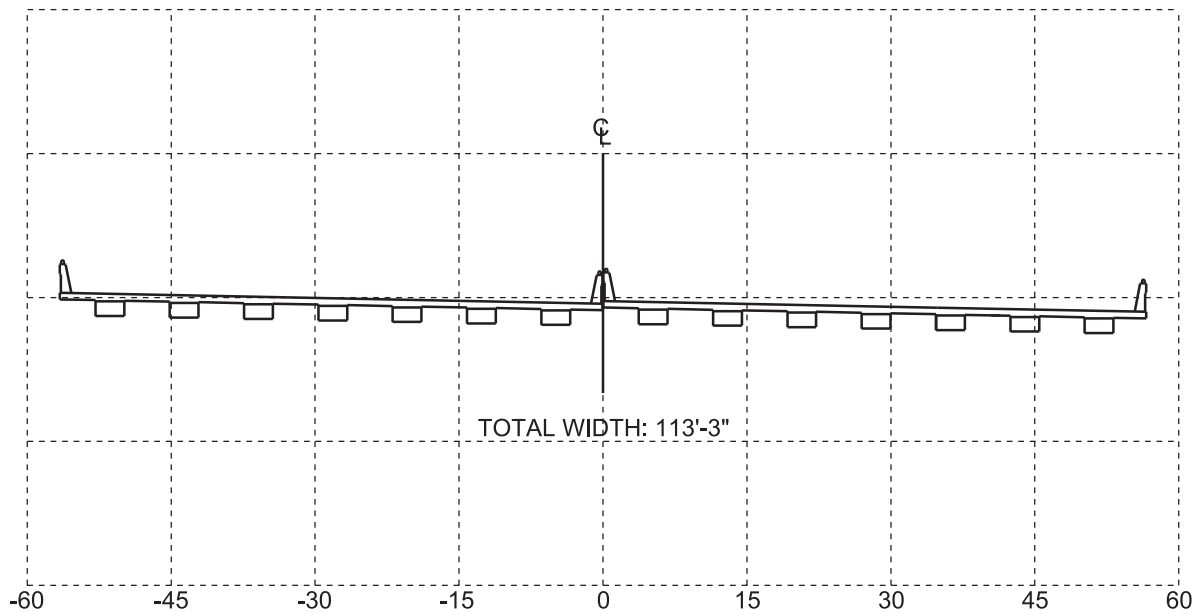
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY

INTERSTATE 24 BRIDGE OVER SOUTH GERMANTOWN ROAD

EXISTING STRUCTURE



PROPOSED STRUCTURE ALTERNATE 1: ABC - PRECAST CONCRETE BOX BEAMS

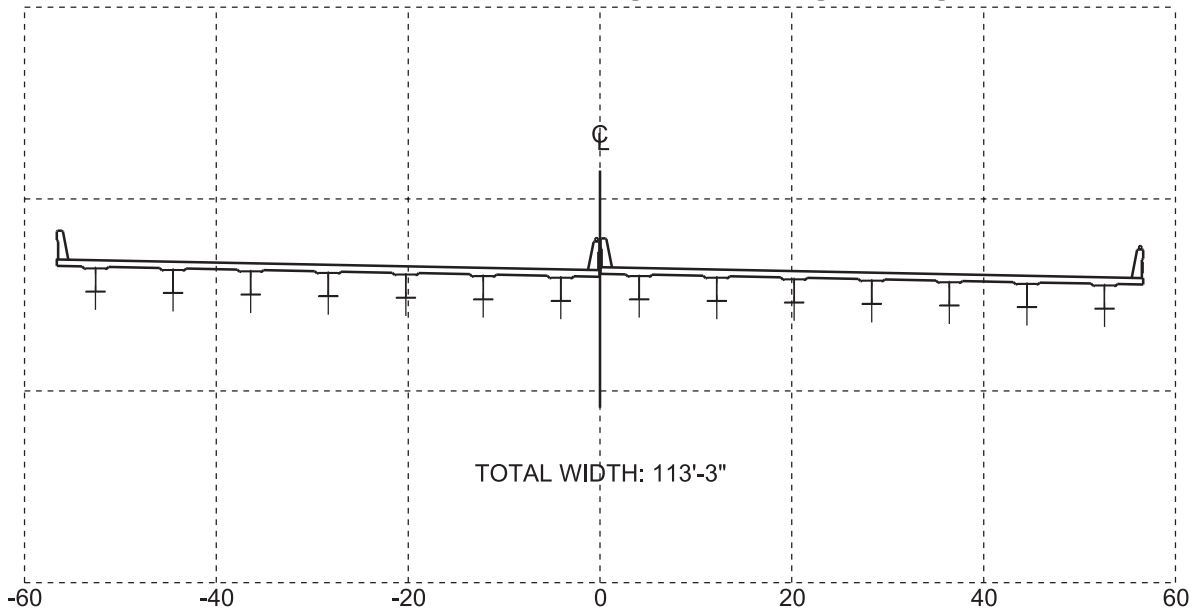


TYPICAL SECTION

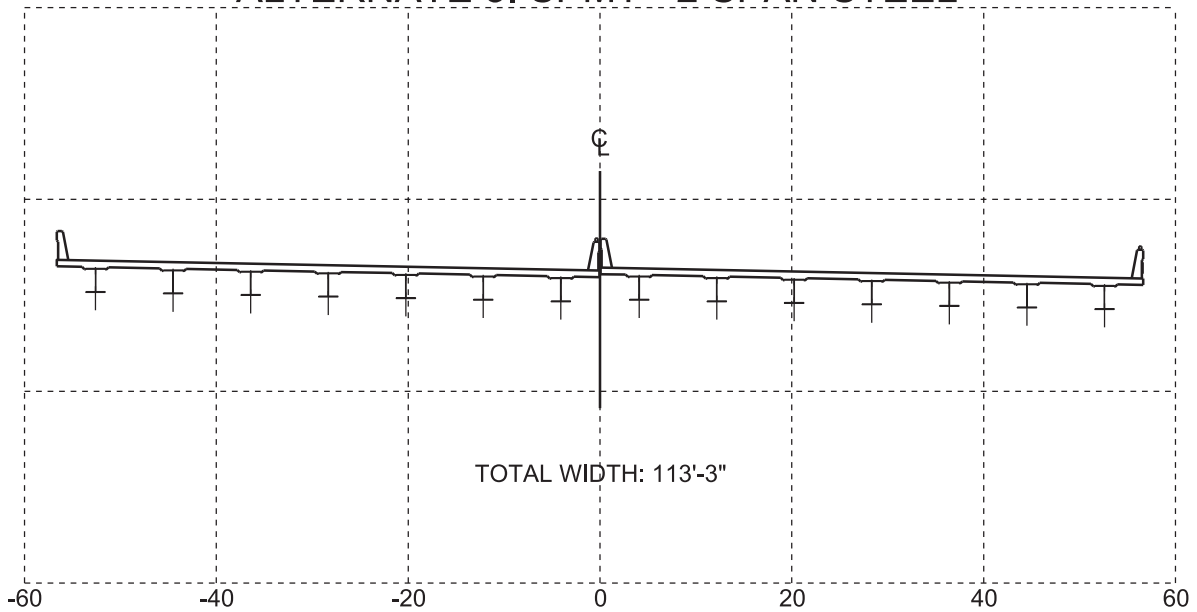
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY

INTERSTATE 24 BRIDGE OVER SOUTH GERMANTOWN ROAD

PROPOSED STRUCTURE ALTERNATE 2: LATERAL SLIDE - 2 SPAN STEEL



PROPOSED STRUCTURE ALTERNATE 3: SPMT - 2 SPAN STEEL



TYPICAL SECTION

PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY

ATTACHMENT 1-B

Preliminary Cost Estimate

PIN 124069.00

Bridge ID: 33I00240055

COST ESTIMATE SUMMARY

(BASELINE: TRADITIONAL CONSTRUCTION)

Route:	Interstate 24 over South Germantown Road	
Description:	PIN 124069.00 - Interstate 24 over Germantown Rd	
County:	Log Mile 12.08	
Length:	Hamilton	
Date:	June 8, 2018	

DESCRIPTION	LOCAL 0%	STATE 0%	FEDERAL 100%	TOTAL
Construction Items				
Pavement Removal	\$0	\$0	\$159,200	\$159,200
Asphalt Paving ⁽⁴⁾	\$0	\$0	\$195,000	\$195,000
Concrete Pavement	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$54,600	\$54,600
Appurtenances	\$0	\$0	\$691,800	\$691,800
Structures ⁽³⁾	\$0	\$0	\$2,692,900	\$2,692,900
Fencing	\$0	\$0	\$0	\$0
Lighting, Signalization, & ITS	\$0	\$0	\$228,500	\$228,500
Railroad Crossing or Separation	\$0	\$0	\$0	\$0
Earthwork	\$0	\$0	\$328,800	\$328,800
Clearing and Grubbing	\$0	\$0	\$0	\$0
Seeding & Sodding	\$0	\$0	\$0	\$0
Rip-Rap or Slope Protection	\$0	\$0	\$0	\$0
Guardrail	\$0	\$0	\$22,000	\$22,000
Signing	\$0	\$0	\$4,400	\$4,400
Pavement Markings ⁽¹⁾	\$0	\$0	\$11,600	\$11,600
Maintenance of Traffic	\$0	\$0	\$294,200	\$294,200
Mobilization (5%)	\$0	\$0	\$234,200	\$234,200
Other Items ⁽²⁾ = 10%	\$0	\$0	\$491,700	\$491,700
Const. Contingency ⁽²⁾ = 15%	\$0	\$0	\$407,400	\$407,400
Construction Estimate	\$0	\$0	\$5,816,300	\$5,816,300
Interchanges & Unique Intersections				
Roundabouts	\$0	\$0	\$0	\$0
Interchanges	\$0	\$0	\$0	\$0
Right-of-Way & Utilities				
	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	100%	
Right-of-Way	\$0	\$0	\$0	\$0
Utilities	\$0	\$0	\$730,700	\$730,700
Preliminary & Construction Engineering and Inspection				
Prelim. Eng. 10%	\$0	\$0	\$654,700	\$654,700
Const. Eng. & Inspec. 10%	\$0	\$0	\$654,700	\$654,700
Total Project Cost	\$0	\$0	\$7,856,400	\$ 7,856,000

⁽¹⁾ Additional quantities were added to the 'Pavement Markings' pay item to account for temporary traffic control.

⁽²⁾ 'Other Items' and 'Const. Contingency' were not increased to account for CM/GC method. The price of 'New Bridge (Concrete Girder)' on the following 'Pay Items' spreadsheet in the pay item table reflects the change in prices for various construction methods.

⁽³⁾ The cost for bridge construction types are as follows and can be seen on the following pay items tables:

- Traditional : \$125.00/s.f.
- ABC 1 (PCC Box Beams & Panels) : \$300.00/s.f.
- ABC 2 (Lateral Slide) : \$500.00/s.f.
- ABC 3 (SPMT) : \$450.00/s.f.

⁽⁴⁾ All traffic phasing options, including temporary ramps, were taken into consideration.

PAY ITEM SUMMARY

(BASELINE: TRADITIONAL CONSTRUCTION)

TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	TOOL QUANTITIES	ADDITIONAL QUANTITIES	TOOL QUANTITIES + ADDITIONAL QUANTITIES	Statewide UNIT COST	TOTAL COST
Pavement Removal							
202-08.15	Removal of Curb and Gutter	LF		682	682	\$ 5.45	\$ 3,717.47
415-01.02	Cold Planning Bituminous Pavement	SY	0	21919.27833	21919	\$ 7.09	\$ 155,382.84
PAVEMENT REMOVAL TOTAL (ROUNDED)							\$ 159,200
Asphalt Roads							
307-03.08	Asphalt Conc MX (PG76-22)(BPMB-HM) GR B-M2	TON		95.50072583	96	\$ 78.53	\$ 7,499.52
403-01	Bituminous Material For Tack Coat (TC)	TON	0	7.331722222	7	\$ 777.06	\$ 5,697.19
411-01.07	ACS (PG64-22) GR "E"	TON	0	313.5	314	\$ 111.16	\$ 34,849.37
411-02.10	ACS Mix(PG70-22) Grading D	TON	0	1221	1221	\$ 113.26	\$ 138,286.03
411-03.08	ACS Mix (PG70-22) Thin Lift CS Asphalt	TON		89.58475167	90	\$ 96.75	\$ 8,667.32
PAVING TOTAL (ROUNDED)							\$ 195,000
Concrete Roads							
CONCRETE RAMPS AND ROADWAYS TOTAL (ROUNDED)							\$ -
Drainage							
607-03.30	18" Pipe Culvert	LF		300	300	\$ 52.65	\$ 15,793.57
611-09.01	ADJUSTMENT OF EXISTING CATCHBASIN	EA		5	5	\$ 736.91	\$ 3,684.54
611-09.02	REWORK CATCHBASIN	EA		7	7	\$ 1,104.68	\$ 7,732.74
611-09.03	CAPPING EXISTING CATCHBASIN	EA		7	7	\$ 1,354.35	\$ 9,480.42
611-10.01	Catch Basins, Type 10, 0' -4' Depth	EA		6	6	\$ 2,973.64	\$ 17,841.84
DRAINAGE TOTAL (ROUNDED)							\$ 54,600
Appurtenances							
202-03	Removal of Rigid Pmnt, Sidewalk, Etc	SY		820	820	\$ 9.53	\$ 7,813.10
701-01.01	Concrete Sidewalk (4")	SF	0	820	820	\$ 7.40	\$ 6,063.91
701-02.03	Concrete Handicap Ramp	SF		570	570	\$ 17.74	\$ 10,112.84
702-01	Concrete Curb	CY		25	25	\$ 334.36	\$ 8,358.93
702-03	Concrete Combined Curb & Gutter	CY	0	40	40	\$ 374.57	\$ 14,982.88
711-05.01	Removal & Disposal of Concrete Median Barrier	LF		2600	2600	\$ 152.55	\$ 396,630.00
711-05.71	51" Single Slope Concrete Barrier Wall	LF	0	2600	2600	\$ 95.30	\$ 247,777.73
ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)							\$ 691,800
Earthwork & Mineral							
203-01	Road & Drainage Excavation (Unclassified)	CY	0	9186.672652	9187	\$ 16.73	\$ 153,664.94
203-03	Borrow Excavation (Unclassified)	CY	0	11691.06056	11691	\$ 14.97	\$ 175,064.29
EARTHWORK & MINERAL TOTAL (ROUNDED)							\$ 328,800
Structures							
N/A	Removal of Bridge	SF	0	16642	16642	\$ 20.00	\$ 332,840.00
N/A	New Bridge (Box)	SF	0	18880	18880	\$ 125.00	\$ 2,360,000.00
STRUCTURES TOTAL (ROUNDED)							\$ 2,692,900
Interchanges and Unique Intersections							
INTERCHANGES AND UNIQUE INTERSECTIONS TOTAL (ROUNDED)							\$ -
Lighting & Signalization							
714-01.32	Structural Lighting	LS		1	1	\$ 9,743.29	\$ 9,743.29
714-03.01	Direct Brl Conduit (2" PVC, Schedule 40)	LF		250	250	\$ 6.67	\$ 1,666.42
714-05.04	Pull Boxes (Type C)	EA		4	4	\$ 620.37	\$ 2,481.49
714-06.05	Cable (1/C # 6 AWG)	LF		500	500	\$ 1.05	\$ 525.00
714-08.01	Light Standards (45' MH, 15' ARM)	EA		3	3	\$ 3,722.26	\$ 11,166.78
714-08.28	Found for Light Standards - Roadway	EA		3	3	\$ 1,384.42	\$ 4,153.26
714-08.30	Remove and Relocate Light Standard	EA		3	3	\$ 2,046.75	\$ 6,140.25
714-09.03	Luminaires (250 WATT)	EA		3	3	\$ 472.73	\$ 1,418.19
714-25	Electrical Connection	EA		1	1	\$ 599.06	\$ 599.06
714-26.05	Temporary Roadway Lighting	LS		1	1	\$ 6,825.00	\$ 6,825.00
730-01.02	Removal of Signal Equipment	EA		2	2	\$ 1,957.79	\$ 3,915.58
730-02.09	Signal Head Assembly (130 With Backplate)	EA		10	10	\$ 807.65	\$ 8,076.53
730-02.17	Signal Head Assembly (150 A2H With Backplate)	EA		2	2	\$ 1,313.83	\$ 2,627.67
730-03.20	Install Pull Box (Type A)	EA		4	4	\$ 385.67	\$ 1,542.67
730-03.21	Install Pull Box (Type B)	EA		4	4	\$ 481.62	\$ 1,926.47
730-05.01	Electrical Service Connection	EA		2	2	\$ 2,023.65	\$ 4,047.30
730-08.03	Signal Cable - 7 Conductor	LF		800	800	\$ 1.65	\$ 1,323.59
730-08.30	Interconnect Cable (Copper-Twisted Pair)	LF		1000	1000	\$ 2.67	\$ 2,670.00
730-12.14	Conduit 3" Diameter (Jack and Bore)	LF		400	400	\$ 25.74	\$ 10,296.16
730-12.16	Conduit (2" Conduit Schedule 80)	LF		200	200	\$ 13.80	\$ 2,760.38
730-13.01	VEHICLE LOOP DETECTOR (SHELF MOUNT)	EA		4	4	\$ 178.62	\$ 714.49
730-14.01	Shielded Detector Cable	LF		350	350	\$ 1.27	\$ 444.66
730-14.02	Saw Slot	LF		2000	2000	\$ 2.89	\$ 5,779.41
730-15.32	Cabinet (Eight Phase Base Mounted)	EA		2	2	\$ 13,544.50	\$ 27,089.00
730-16.02	Eight Phase Actuated Controller	EA		2	2	\$ 4,736.56	\$ 9,473.13
730-23.88	Cantilever Signal Support (1 ARM @ 45')	EA		3	3	\$ 14,116.19	\$ 42,348.57
730-23.96	Cantilever Signal Support (1 ARM @ 50')	EA		3	3	\$ 19,551.62	\$ 58,654.85
LIGHTING & SIGNALIZATION TOTAL (ROUNDED)							\$ 228,500
Guardrail							
705-01.01	Guardrail at Bridge Ends	LF	100		100	\$ 73.64	\$ 7,364.49
705-04.07	Tan Energy Absg Term (NCHRP, 350, TL3)	EA		4	4	\$ 2,352.59	\$ 9,410.38
705-04.09	Earth Pad for Type 38 GR End Treatment	EA		4	4	\$ 1,294.80	\$ 5,179.21
GUARDRAIL TOTAL (ROUNDED)							\$ 22,000
Seeding and Sodding							
SODDING TOTAL (ROUNDED)							\$ -
Maintenance of Traffic							
N/A	Traffic Control	LS	1		1	\$ -	\$ 94,232.64
712-02.02	Interconnected Portable Barrier Rail	LF	0	5200	5200	\$ 31.79	\$ 165,297.44
712-04.50	Portable Barrier Rail Delineator	EA		100	100	\$ 11.17	\$ 1,117.27
712-09.01	Removable Pavement Marking Line	LF		16000	16000	\$ 2.09	\$ 33,494.26
MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)							\$ 294,200
Signs							
Not Listed	Signs (Construction)	LS	1		1	\$ -	\$ 4,400
SIGNING TOTAL (ROUNDED)							\$ 4,400

PAY ITEM SUMMARY

(BASELINE: TRADITIONAL CONSTRUCTION)

Pavement Markings							
716-09.31	STOP LINE	LF		200	200	\$ 16.65	\$ 3,330.00
716-13.06	Spray Thermo P.M. (40 mil 4")	LM	0.0	2	2.0	\$ 2,878.11	\$ 5,756.23
716-13.07	Spray Thermo P.M. (40 mil 6")	LM		2	2	\$ 1,237.50	\$ 2,475.00
PAVEMENT MARKINGS TOTAL (ROUNDED)							\$ 11,600
Fencing							
FENCE TOTAL (ROUNDED)							\$ -
Rip-Rap							
RIP-RAP & SLOPE PROTECTION TOTAL (ROUNDED)							\$ -
Clearing and Grubbing							
CLEAR AND GRUBBING TOTAL (ROUNDED)							\$ -
Railroad At-Grade Crossing							
RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)							\$ -
Utilities							
N/A	Overhead Distribution	LM	0.25		0.25	\$ 375,000	\$ 93,750
N/A	Overhead Transmission	LM	0.25		0.25	\$ 750,000	\$ 187,500
N/A	Underground Power	LM	0.25		0.25	\$ 500,000	\$ 125,000
N/A	Underground Communication	LM	0.25		0.25	\$ 500,000	\$ 125,000
N/A	Underground Gas	LM	0.25		0.25	\$ 250,000	\$ 62,500
N/A	Underground Water	LM	0.25		0.25	\$ 237,600	\$ 59,400
N/A	Underground Sewer	LM	0.25		0.25	\$ 310,200	\$ 77,550
UTILITIES TOTAL (ROUNDED)							\$ 730,700.00
Right-of-Way							
N/A	Right-of-Way	LS	1		1	\$ -	\$ -
RIGHT-OF-WAY TOTAL (ROUNDED)							\$ -

COST ESTIMATE SUMMARY

(ABC 1 - PCC BOX BEAMS AND PANELS)

Route:	Interstate 24 over South Germantown Road	
Description:	PIN 124069.00 - Interstate 24 over Germantown Rd	
County:	Log Mile 12.08	
Length:	Hamilton	
Date:	June 11, 2018	

DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	100%	
Construction Items				
Pavement Removal	\$0	\$0	\$148,000	\$148,000
Asphalt Paving ⁽⁴⁾	\$0	\$0	\$195,000	\$195,000
Concrete Pavement	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$54,600	\$54,600
Appurtenances	\$0	\$0	\$691,800	\$691,800
Structures ⁽³⁾	\$0	\$0	\$6,472,100	\$6,472,100
Fencing	\$0	\$0	\$0	\$0
Lighting, Signalization, & ITS	\$0	\$0	\$228,500	\$228,500
Railroad Crossing or Separation	\$0	\$0	\$0	\$0
Earthwork	\$0	\$0	\$328,800	\$328,800
Clearing and Grubbing	\$0	\$0	\$0	\$0
Seeding & Sodding	\$0	\$0	\$0	\$0
Rip-Rap or Slope Protection	\$0	\$0	\$0	\$0
Guardrail	\$0	\$0	\$22,000	\$22,000
Signing	\$0	\$0	\$8,100	\$8,100
Pavement Markings ⁽¹⁾	\$0	\$0	\$11,600	\$11,600
Maintenance of Traffic	\$0	\$0	\$323,600	\$323,600
Mobilization (5%)	\$0	\$0	\$424,200	\$424,200
Other Items ⁽²⁾ = 10%	\$0	\$0	\$890,800	\$890,800
Const. Contingency ⁽²⁾ = 15%	\$0	\$0	\$499,100	\$499,100
Construction Estimate	\$0	\$0	\$10,298,200	\$10,298,200
Interchanges & Unique Intersections				
Roundabouts	\$0	\$0	\$0	\$0
Interchanges	\$0	\$0	\$0	\$0
Right-of-Way & Utilities				
	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	100%	
Right-of-Way	\$0	\$0	\$0	\$0
Utilities	\$0	\$0	\$730,700	\$730,700
Preliminary & Construction Engineering and Inspection				
Prelim. Eng.	9%	\$0	\$1,017,700	\$1,017,700
Const. Eng. & Inspec.	10%	\$0	\$1,102,900	\$1,102,900
Total Project Cost	\$0	\$0	\$13,149,500	\$ 13,150,000

⁽¹⁾ Additional quantities were added to the 'Pavement Markings' pay item to account for temporary traffic control.

⁽²⁾ 'Other Items' and 'Const. Contingency' were not increased to account for CM/GC method. The price of 'New Bridge (Concrete Girder)' on the following 'Pay Items' spreadsheet in the pay item table reflects the change in prices for various construction methods.

⁽³⁾ The cost for bridge construction types are as follows and can be seen on the following pay items tables:

Traditional : \$125.00/s.f.

ABC 1 (PCC Box Beams & Panels) : \$300.00/s.f.

ABC 2 (Lateral Slide) : \$500.00/s.f.

ABC 3 (SPMT) : \$450.00/s.f.

⁽⁴⁾ All traffic phasing options, including temporary ramps, were taken into consideration.

PAY ITEM SUMMARY

(ABC 1 - PCC BOX BEAMS AND PANELS)

TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	TOOL QUANTITIES	ADDITIONAL QUANTITIES	TOOL QUANTITIES + ADDITIONAL QUANTITIES	Statewide UNIT COST	TOTAL COST
Pavement Removal							
202-08.15	Removal of Curb and Gutter	LF		682	682	\$ 5.45	\$ 3,717.47
415-01.02	Cold Planning Bituminous Pavement	SY	0	20229	20229	\$ 7.13	\$ 144,274.47
PAVEMENT REMOVAL TOTAL (ROUNDED)							\$ 148,000
Asphalt Roads							
307-03.08	Asphalt Conc MX (PG76-22)(BPMB-HM) GR B-M2	TON		95.50072583	96	\$ 78.53	\$ 7,499.52
403-01	Bituminous Material For Tack Coat (TC)	TON	0	7.331722222	7	\$ 777.06	\$ 5,697.19
411-01.07	ACS (PG64-22) GR "E"	TON	0	313.5	314	\$ 111.16	\$ 34,849.37
411-02.10	ACS Mix(PG70-22) Grading D	TON	0	1221	1221	\$ 113.26	\$ 138,286.03
411-03.08	ACS Mix (PG70-22) Thin Lift CS Asphalt	TON		89.58475167	90	\$ 96.75	\$ 8,667.32
PAVING TOTAL (ROUNDED)							\$ 195,000
Concrete Roads							
CONCRETE RAMPS AND ROADWAYS TOTAL (ROUNDED)							\$ -
Drainage							
607-03.30	18" Pipe Culvert	LF		300	300	\$ 52.65	\$ 15,793.57
611-09.01	ADJUSTMENT OF EXISTING CATCHBASIN	EA		5	5	\$ 736.91	\$ 3,684.54
611-09.02	REWORK CATCHBASIN	EA		7	7	\$ 1,104.68	\$ 7,732.74
611-09.03	CAPPING EXISTING CATCHBASIN	EA		7	7	\$ 1,354.35	\$ 9,480.42
611-10.01	Catch Basins, Type 10, 0' -4' Depth	EA		6	6	\$ 2,973.64	\$ 17,841.84
DRAINAGE TOTAL (ROUNDED)							\$ 54,600
Appurtenances							
202-03	Removal of Rigid Pmnt, Sidewalk, Etc	SY		820	820	\$ 9.53	\$ 7,813.10
701-01.01	Concrete Sidewalk (4")	SF	0	820	820	\$ 7.40	\$ 6,063.91
701-02.03	Concrete Handicap Ramp	SF		570	570	\$ 17.74	\$ 10,112.84
702-01	Concrete Curb	CY		25	25	\$ 334.36	\$ 8,358.93
702-03	Concrete Combined Curb & Gutter	CY	0	40	40	\$ 374.57	\$ 14,982.88
711-05.01	Removal & Disposal of Concrete Median Barrier	LF		2600	2600	\$ 152.55	\$ 396,630.00
711-05.71	51" Single Slope Concrete Barrier Wall	LF	0	2600	2600	\$ 95.30	\$ 247,777.73
ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)							\$ 691,800
Earthwork & Mineral							
203-01	Road & Drainage Excavation (Unclassified)	CY	0	9186.672652	9187	\$ 16.73	\$ 153,664.94
203-03	Borrow Excavation (Unclassified)	CY	0	11691.06056	11691	\$ 14.97	\$ 175,064.29
EARTHWORK & MINERAL TOTAL (ROUNDED)							\$ 328,800
Structures							
N/A	Removal of Bridge	SF	0	16642	16642	\$ 50.00	\$ 832,100.00
N/A	New Bridge (Box):	SF	0	18800	18800	\$ 300.00	\$ 5,640,000.00
STRUCTURES TOTAL (ROUNDED)							\$ 6,472,100
Interchanges and Unique Intersections							
INTERCHANGES AND UNIQUE INTERSECTIONS TOTAL (ROUNDED)							\$ -
Lighting & Signalization							
714-01.32	Structural Lighting	LS		1	1	\$ 9,743.29	\$ 9,743.29
714-03.01	Direct Brl Conduit (2" PVC, Schedule 40)	LF		250	250	\$ 6.67	\$ 1,666.42
714-05.04	Pull Boxes (Type C)	EA		4	4	\$ 620.37	\$ 2,481.49
714-06.05	Cable (1/C # 6 AWG)	LF		500	500	\$ 1.05	\$ 525.00
714-08.01	Light Standards (45' MH, 15' ARM)	EA		3	3	\$ 3,722.26	\$ 11,166.78
714-08.28	Found for Light Standards - Roadway	EA		3	3	\$ 1,384.42	\$ 4,153.26
714-08.30	Remove and Relocate Light Standard	EA		3	3	\$ 2,046.75	\$ 6,140.25
714-09.03	Luminaires (250 WATT)	EA		3	3	\$ 472.73	\$ 1,418.19
714-25	Electrical Connection	EA		1	1	\$ 599.06	\$ 599.06
714-26.05	Temporary Roadway Lighting	LS		1	1	\$ 6,825.00	\$ 6,825.00
730-01.02	Removal of Signal Equipment	EA		2	2	\$ 1,957.79	\$ 3,915.58
730-02.09	Signal Head Assembly (130 With Backplate)	EA		10	10	\$ 807.65	\$ 8,076.53
730-02.17	Signal Head Assembly (150 A2H With Backplate)	EA		2	2	\$ 1,313.83	\$ 2,627.67
730-03.20	Install Pull Box (Type A)	EA		4	4	\$ 385.67	\$ 1,542.67
730-03.21	Install Pull Box (Type B)	EA		4	4	\$ 481.62	\$ 1,926.47
730-05.01	Electrical Service Connection	EA		2	2	\$ 2,023.65	\$ 4,047.30
730-08.03	Signal Cable - 7 Conductor	LF		800	800	\$ 1.65	\$ 1,323.59
730-08.30	Interconnect Cable (Copper-Twisted Pair)	LF		1000	1000	\$ 2.67	\$ 2,670.00
730-12.14	Conduit 3" Diameter (Jack and Bore)	LF		400	400	\$ 25.74	\$ 10,296.16
730-12.16	Conduit (2" Conduit Schedule 80)	LF		200	200	\$ 13.80	\$ 2,760.38
730-13.01	VEHICLE LOOP DETECTOR (SHELF MOUNT)	EA		4	4	\$ 178.62	\$ 714.49
730-14.01	Shielded Detector Cable	LF		350	350	\$ 1.27	\$ 444.66
730-14.02	Saw Slot	LF		2000	2000	\$ 2.89	\$ 5,779.41
730-15.32	Cabinet (Eight Phase Base Mounted)	EA		2	2	\$ 13,544.50	\$ 27,089.00
730-16.02	Eight Phase Actuated Controller	EA		2	2	\$ 4,736.56	\$ 9,473.13
730-23.88	Cantilever Signal Support (1 ARM @ 45')	EA		3	3	\$ 14,116.19	\$ 42,348.57
730-23.96	Cantilever Signal Support (1 ARM @ 50')	EA		3	3	\$ 19,551.62	\$ 58,654.85
LIGHTING & SIGNALIZATION TOTAL (ROUNDED)							\$ 228,500
Guardrail							
705-01.01	Guardrail at Bridge Ends	LF	100		100	\$ 73.64	\$ 7,364.49
705-04.07	Tan Energy Absg Term (NCHRP, 350, TL3)	EA		4	4	\$ 2,352.59	\$ 9,410.38
705-04.09	Earth Pad for Type 3R GR End Treatment	EA		4	4	\$ 1,294.80	\$ 5,179.21
GUARDRAIL TOTAL (ROUNDED)							\$ 22,000
Seeding and Sodding							
SODDING TOTAL (ROUNDED)							\$ -
Maintenance of Traffic							
N/A	Traffic Control	LS	1		1	\$ -	\$ 123,651.90
712-02.02	Interconnected Portable Barrier Rail	LF	0	5200	5200	\$ 31.79	\$ 165,297.44
712-04.50	Portable Barrier Rail Delineator	EA		100	100	\$ 11.17	\$ 1,117.27
712-09.01	Removable Pavement Marking Line	LF		16000	16000	\$ 2.09	\$ 33,494.26
MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)							\$ 323,600
Signs							
Not Listed	Signs (Construction)	LS	1		1	\$ -	\$ 8,100
SIGNING TOTAL (ROUNDED)							\$ 8,100

PAY ITEM SUMMARY

(ABC 1 - PCC BOX BEAMS AND PANELS)

Pavement Markings							
716-09.31	STOP LINE	LF		200	200	\$ 16.65	\$ 3,330.00
716-13.06	Spray Thermo P.M. (40 mil 4")	LM	0.0	2	2.0	\$ 2,878.11	\$ 5,756.23
716-13.07	Spray Thermo P.M. (40 mil 6")	LM		2	2	\$ 1,237.50	\$ 2,475.00
PAVEMENT MARKINGS TOTAL (ROUNDED)							\$ 11,600
Fencing							
FENCE TOTAL (ROUNDED)							\$ -
Rip-Rap							
RIP-RAP & SLOPE PROTECTION TOTAL (ROUNDED)							\$ -
Clearing and Grubbing							
CLEAR AND GRUBBING TOTAL (ROUNDED)							\$ -
Railroad At-Grade Crossing							
RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)							\$ -
Utilities							
N/A	Overhead Distribution	LM	0.25		0.25	\$ 375,000	\$ 93,750
N/A	Overhead Transmission	LM	0.25		0.25	\$ 750,000	\$ 187,500
N/A	Underground Power	LM	0.25		0.25	\$ 500,000	\$ 125,000
N/A	Underground Communication	LM	0.25		0.25	\$ 500,000	\$ 125,000
N/A	Underground Gas	LM	0.25		0.25	\$ 250,000	\$ 62,500
N/A	Underground Water	LM	0.25		0.25	\$ 237,600	\$ 59,400
N/A	Underground Sewer	LM	0.25		0.25	\$ 310,200	\$ 77,550
UTILITIES TOTAL (ROUNDED)							\$ 730,700.00
Right-of-Way							
N/A	Right-of-Way	LS	1		1	\$ -	\$ -
RIGHT-OF-WAY TOTAL (ROUNDED)							\$ -

COST ESTIMATE SUMMARY

(ABC 2 - LATERAL SLIDE)

Route:	Interstate 24 over South Germantown Road	
Description:	PIN 124069.00 - Interstate 24 over Germantown Rd	
County:	Log Mile 12.08	
Length:	Hamilton	
Date:	June 11, 2018	

DESCRIPTION	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	100%	
Construction Items				
Pavement Removal ⁽⁵⁾	\$0	\$0	\$606,100	\$606,100
Asphalt Paving ⁽⁴⁾⁽⁵⁾	\$0	\$0	\$305,200	\$305,200
Concrete Pavement	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$54,600	\$54,600
Appurtenances	\$0	\$0	\$691,800	\$691,800
Structures ⁽³⁾	\$0	\$0	\$10,232,100	\$10,232,100
Fencing	\$0	\$0	\$0	\$0
Lighting, Signalization, & ITS	\$0	\$0	\$228,500	\$228,500
Railroad Crossing or Separation	\$0	\$0	\$0	\$0
Earthwork	\$0	\$0	\$328,800	\$328,800
Clearing and Grubbing	\$0	\$0	\$0	\$0
Seeding & Sodding	\$0	\$0	\$0	\$0
Rip-Rap or Slope Protection	\$0	\$0	\$0	\$0
Guardrail	\$0	\$0	\$22,000	\$22,000
Signing	\$0	\$0	\$12,500	\$12,500
Pavement Markings ⁽¹⁾	\$0	\$0	\$15,300	\$15,300
Maintenance of Traffic	\$0	\$0	\$357,400	\$357,400
Mobilization (5%)	\$0	\$0	\$642,700	\$642,700
Other Items ⁽²⁾ = 10%	\$0	\$0	\$1,349,700	\$1,349,700
Const. Contingency ⁽²⁾ = 15%	\$0	\$0	\$692,200	\$692,200
Construction Estimate	\$0	\$0	\$15,538,900	\$15,538,900
Interchanges & Unique Intersections				
Roundabouts	\$0	\$0	\$0	\$0
Interchanges	\$0	\$0	\$0	\$0
Right-of-Way & Utilities				
	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	100%	
Right-of-Way	\$0	\$0	\$0	\$0
Utilities	\$0	\$0	\$730,700	\$730,700
Preliminary & Construction Engineering and Inspection				
Prelim. Eng.	9%	\$0	\$1,441,700	\$1,441,700
Const. Eng. & Inspec.	10%	\$0	\$1,627,000	\$1,627,000
Total Project Cost	\$0	\$0	\$19,338,300	\$ 19,338,000

⁽¹⁾ Additional quantities were added to the 'Pavement Markings' pay item to account for temporary traffic control.

⁽²⁾ 'Other Items' and 'Const. Contingency' were not increased to account for CM/GC method. The price of 'New Bridge (Concrete Girder)' on the following 'Pay Items' spreadsheet in the pay item table reflects the change in prices for various construction methods.

⁽³⁾ The cost for bridge construction types are as follows and can be seen on the following pay items tables:

Traditional : \$125.00/s.f.

ABC 1 (PCC Box Beams & Panels) : \$300.00/s.f.

ABC 2 (Lateral Slide) : \$500.00/s.f.

ABC 3 (SPMT) : \$450.00/s.f.

⁽⁴⁾ All traffic phasing options, including temporary ramps, were taken into consideration.

⁽⁵⁾ For the ABC 2 - Lateral Slide construction option, quantities for 'Pavement Removal' and 'Asphalt Paving' would be larger because temporary structures must be built and later removed.

PAY ITEM SUMMARY (ABC 2 - LATERAL SLIDE)

TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	TOOL QUANTITIES	ADDITIONAL QUANTITIES	TOOL QUANTITIES + ADDITIONAL QUANTITIES	Statewide UNIT COST	TOTAL COST
Pavement Removal							
202-03.01	Removal of Asphalt Pavement	SY	0	84480	84480	\$ 5.42	\$ 458,100.13
202-08.15	Removal of Curb and Gutter	LF		682	682	\$ 5.45	\$ 3,717.47
415-01.02	Cold Planning Bituminous Pavement	SY	0	20229	20229	\$ 7.13	\$ 144,274.47
PAVEMENT REMOVAL TOTAL (ROUNDED)							\$ 606,100
Asphalt Roads							
307-01.08	Asphalt Conc MIX (PG64-22) (BPMB-HM) GR B-M2	TON		95.50072583	95.50072583	\$ 77.20	\$ 7,372.19
403-01	Bituminous Material For Tack Coat (TC)	TON	0	11.73172222	12	\$ 774.46	\$ 9,085.71
411-01.07	ACS (PG64-22) GR "E"	TON	0	797.5	798	\$ 108.88	\$ 86,830.76
411-02.10	ACS Mix(PG70-22) Grading D	TON	0	1719.3	1719	\$ 112.39	\$ 193,227.27
411-03.08	ACS Mix (PG70-22) Thin Lift CS Asphalt	TON		89.58475167	90	\$ 96.75	\$ 8,667.32
PAVING TOTAL (ROUNDED)							\$ 305,200
Concrete Roads							
CONCRETE RAMPS AND ROADWAYS TOTAL (ROUNDED)							\$ -
Drainage							
607-03.30	18" Pipe Culvert	LF		300	300	\$ 52.65	\$ 15,793.57
611-09.01	ADJUSTMENT OF EXISTING CATCHBASIN	EA		5	5	\$ 736.91	\$ 3,684.54
611-09.02	REWORK CATCHBASIN	EA		7	7	\$ 1,104.68	\$ 7,732.74
611-09.03	CAPPING EXISTING CATCHBASIN	EA		7	7	\$ 1,354.35	\$ 9,480.42
611-10.01	Catch Basins, Type 10, 0'-4" Depth	EA		6	6	\$ 2,973.64	\$ 17,841.84
DRAINAGE TOTAL (ROUNDED)							\$ 54,600
Appurtenances							
202-03	Removal of Rigid Pvmnt, Sidewalk, Etc	SY		820	820	\$ 9.53	\$ 7,813.10
701-01.01	Concrete Sidewalk (4")	SF	0	820	820	\$ 7.40	\$ 6,063.91
701-02.03	Concrete Handicap Ramp	SF		570	570	\$ 17.74	\$ 10,112.84
702-01	Concrete Curb	CY		25	25	\$ 334.36	\$ 8,358.93
702-03	Concrete Combined Curb & Gutter	CY	0	40	40	\$ 374.57	\$ 14,982.88
711-05.01	Removal & Disposal of Concrete Median Barrier	LF		2600	2600	\$ 152.55	\$ 396,630.00
711-05.71	51" Single Slope Concrete Barrier Wall	LF	0	2600	2600	\$ 95.30	\$ 247,777.73
ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)							\$ 691,800
Earthwork & Mineral							
203-01	Road & Drainage Excavation (Unclassified)	CY	0	9186.672652	9187	\$ 16.73	\$ 153,664.94
203-03	Borrow Excavation (Unclassified)	CY	0	11691.06056	11691	\$ 14.97	\$ 175,064.29
EARTHWORK & MINERAL TOTAL (ROUNDED)							\$ 328,800
Structures							
N/A	Removal of Bridge	SF	0	16642	16642	\$ 50.00	\$ 832,100.00
N/A	New Bridge (Steel Girder):	SF	0	18800	18800	\$ 500.00	\$ 9,400,000.00
STRUCTURES TOTAL (ROUNDED)							\$ 10,232,100
Interchanges and Unique Intersections							
INTERCHANGES AND UNIQUE INTERSECTIONS TOTAL (ROUNDED)							\$ -
Lighting & Signalization							
714-01.32	Structural Lighting	LS		1	1	\$ 9,743.29	\$ 9,743.29
714-03.01	Direct Brl Conduit (2" PVC, Schedule 40)	LF		250	250	\$ 6.67	\$ 1,666.42
714-05.04	Pull Boxes (Type C)	EA		4	4	\$ 620.37	\$ 2,481.49
714-06.05	Cable (1/C # 6 AWG)	LF		500	500	\$ 1.05	\$ 525.00
714-08.01	Light Standards (45' MH, 15' ARM)	EA		3	3	\$ 3,722.26	\$ 11,166.78
714-08.28	Found for Light Standards - Roadway	EA		3	3	\$ 1,384.42	\$ 4,153.26
714-08.30	Remove and Relocate Light Standard	EA		3	3	\$ 2,046.75	\$ 6,140.25
714-09.03	Luminaires (250 WATT)	EA		3	3	\$ 472.73	\$ 1,418.19
714-25	Electrical Connection	EA		1	1	\$ 599.06	\$ 599.06
714-26.05	Temporary Roadway Lighting	LS		1	1	\$ 6,825.00	\$ 6,825.00
730-01.02	Removal of Signal Equipment	EA		2	2	\$ 1,957.79	\$ 3,915.58
730-02.09	Signal Head Assembly (130 With Backplate)	EA		10	10	\$ 807.65	\$ 8,076.53
730-02.17	Signal Head Assembly (150 AZH With Backplate)	EA		2	2	\$ 1,313.83	\$ 2,627.67
730-03.20	Install Pull Box (Type A)	EA		4	4	\$ 385.67	\$ 1,542.67
730-03.21	Install Pull Box (Type B)	EA		4	4	\$ 481.62	\$ 1,926.47
730-05.01	Electrical Service Connection	EA		2	2	\$ 2,023.65	\$ 4,047.30
730-08.03	Signal Cable - 7 Conductor	LF		800	800	\$ 1.65	\$ 1,323.59
730-08.30	Interconnect Cable (Copper-Twisted Pair)	LF		1000	1000	\$ 2.67	\$ 2,670.00
730-12.14	Conduit 3" Diameter (Jack and Bore)	LF		400	400	\$ 25.74	\$ 10,296.16
730-12.16	Conduit (2" Conduit Schedule 80)	LF		200	200	\$ 13.80	\$ 2,760.38
730-13.01	VEHICLE LOOP DETECTOR (SHELF MOUNT)	EA		4	4	\$ 178.62	\$ 714.49
730-14.01	Shielded Detector Cable	LF		350	350	\$ 1.27	\$ 444.66
730-14.02	Saw Slot	LF		2000	2000	\$ 2.89	\$ 5,779.41
730-15.32	Cabinet (Eight Phase Base Mounted)	EA		2	2	\$ 13,544.50	\$ 27,089.00
730-16.02	Eight Phase Actuated Controller	EA		2	2	\$ 4,736.56	\$ 9,473.13
730-23.88	Cantilever Signal Support (1 ARM @ 45')	EA		3	3	\$ 14,116.19	\$ 42,348.57
730-23.96	Cantilever Signal Support (1 ARM @ 50')	EA		3	3	\$ 19,551.62	\$ 58,654.85
LIGHTING & SIGNALIZATION TOTAL (ROUNDED)							\$ 228,500
Guardrail							
705-01.01	Guardrail at Bridge Ends	LF	100		100	\$ 73.64	\$ 7,364.49
705-04.07	Tan Energy Absg Term (NCHRP, 350, TL3)	EA	4		4	\$ 2,352.59	\$ 9,410.38
705-04.09	Earth Pad for Type 38 GR End Treatment	EA	4		4	\$ 1,294.80	\$ 5,179.21
GUARDRAIL TOTAL (ROUNDED)							\$ 22,000
Seeding and Sodding							
SODDING TOTAL (ROUNDED)							\$ -
Maintenance of Traffic							
N/A	Traffic Control	LS	1		1		\$ 157,475.82
712-02.02	Interconnected Portable Barrier Rail	LF	0	5200	5200	\$ 31.79	\$ 165,297.44
712-04.50	Portable Barrier Rail Delineator	EA		100	100	\$ 11.17	\$ 1,117.27
712-09.01	Removable Pavement Marking Line	LF		16000	16000	\$ 2.09	\$ 33,494.26
MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)							\$ 357,400
Signs							
Not Listed	Signs (Construction)	LS	1		1		\$ 12,500

PAY ITEM SUMMARY

(ABC 2 - LATERAL SLIDE)

							SIGNING TOTAL (ROUNDED)	\$	12,500
Pavement Markings									
716-09.31	STOP LINE	LF		200	200	\$	16.65	\$	3,330.00
716-13.06	Spray Thermo P.M. (40 mil 4")	LM	0.0	2	2	\$	2,878.11	\$	5,756.23
716-13.07	Spray Thermo P.M. (40 mil 6")	LM		5	5	\$	1,237.50	\$	6,187.50
PAVEMENT MARKINGS TOTAL (ROUNDED)								\$	15,300
Fencing									
FENCE TOTAL (ROUNDED)								\$	-
Rip-Rap									
RIP-RAP & SLOPE PROTECTION TOTAL (ROUNDED)								\$	-
Clearing and Grubing									
CLEAR AND GRUBBING TOTAL (ROUNDED)								\$	-
Railroad At-Grade Crossing									
RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)								\$	-
Utilities									
N/A	Overhead Distribution	LM	0.25		0.25	\$	375,000	\$	93,750
N/A	Overhead Transmission	LM	0.25		0.25	\$	750,000	\$	187,500
N/A	Underground Power	LM	0.25		0.25	\$	500,000	\$	125,000
N/A	Underground Communication	LM	0.25		0.25	\$	500,000	\$	125,000
N/A	Underground Gas	LM	0.25		0.25	\$	250,000	\$	62,500
N/A	Underground Water	LM	0.25		0.25	\$	237,600	\$	59,400
N/A	Underground Sewer	LM	0.25		0.25	\$	310,200	\$	77,550
UTILITIES TOTAL (ROUNDED)								\$	730,700.00
Right-of-Way									
N/A	Right-of-Way	LS	1		1	\$	-	\$	-
RIGHT-OF-WAY TOTAL (ROUNDED)								\$	-

COST ESTIMATE SUMMARY

(ABC 3 - SPMT)

Route:	Interstate 24 over South Germantown Road	
Description:	PIN 124069.00 - Interstate 24 over Germantown Rd	
County:	Log Mile 12.08	
Length:	Hamilton	
Date:	June 11, 2018	

DESCRIPTION	LOCAL 0%	STATE 0%	FEDERAL 100%	TOTAL
Construction Items				
Pavement Removal	\$0	\$0	\$148,000	\$148,000
Asphalt Paving ⁽⁴⁾	\$0	\$0	\$195,000	\$195,000
Concrete Pavement	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$54,600	\$54,600
Appurtenances	\$0	\$0	\$691,800	\$691,800
Structures ⁽³⁾	\$0	\$0	\$9,292,100	\$9,292,100
Fencing	\$0	\$0	\$0	\$0
Lighting, Signalization, & ITS	\$0	\$0	\$228,500	\$228,500
Railroad Crossing or Separation	\$0	\$0	\$0	\$0
Earthwork	\$0	\$0	\$328,800	\$328,800
Clearing and Grubbing	\$0	\$0	\$0	\$0
Seeding & Sodding	\$0	\$0	\$0	\$0
Rip-Rap or Slope Protection	\$0	\$0	\$0	\$0
Guardrail	\$0	\$0	\$22,000	\$22,000
Signing	\$0	\$0	\$11,000	\$11,000
Pavement Markings ⁽¹⁾	\$0	\$0	\$11,600	\$11,600
Maintenance of Traffic	\$0	\$0	\$345,600	\$345,600
Mobilization (5%)	\$0	\$0	\$566,500	\$566,500
Other Items ⁽²⁾ = 10%	\$0	\$0	\$1,189,600	\$1,189,600
Const. Contingency ⁽²⁾ = 15%	\$0	\$0	\$569,000	\$569,000
Construction Estimate	\$0	\$0	\$13,654,100	\$13,654,100
Interchanges & Unique Intersections				
Roundabouts	\$0	\$0	\$0	\$0
Interchanges	\$0	\$0	\$0	\$0
Right-of-Way & Utilities				
	LOCAL	STATE	FEDERAL	TOTAL
	0%	0%	100%	
Right-of-Way	\$0	\$0	\$0	\$0
Utilities	\$0	\$0	\$730,700	\$730,700
Preliminary & Construction Engineering and Inspection				
Prelim. Eng. 9%	\$0	\$0	\$1,293,600	\$1,293,600
Const. Eng. & Inspec. 10%	\$0	\$0	\$1,438,500	\$1,438,500
Total Project Cost	\$0	\$0	\$17,116,900	\$ 17,117,000

⁽¹⁾ Additional quantities were added to the 'Pavement Markings' pay item to account for temporary traffic control.

⁽²⁾ 'Other Items' and 'Const. Contingency' were not increased to account for CM/GC method. The price of 'New Bridge (Concrete Girder)' on the following 'Pay Items' spreadsheet in the pay item table reflects the change in prices for various construction methods.

⁽³⁾ The cost for bridge construction types are as follows and can be seen on the following pay items tables:

Traditional : \$125.00/s.f.

ABC 1 (PCC Box Beams & Panels) : \$300.00/s.f.

ABC 2 (Lateral Slide) : \$500.00/s.f.

ABC 3 (SPMT) : \$450.00/s.f.

⁽⁴⁾ All traffic phasing options, including temporary ramps, were taken into consideration.

PAY ITEM SUMMARY (ABC 3 - SPMT)

TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	TOOL QUANTITIES	ADDITIONAL QUANTITIES	TOOL QUANTITIES + ADDITIONAL QUANTITIES	Statewide UNIT COST	TOTAL COST
Pavement Removal							
202-08.15	Removal of Curb and Gutter	LF		682	682	\$ 5.45	\$ 3,717.47
415-01.02	Cold Planning Bituminous Pavement	SY	0	20229	20229	\$ 7.13	\$ 144,274.47
PAVEMENT REMOVAL TOTAL (ROUNDED)							\$ 148,000
Asphalt Roads							
307-03.08	Asphalt Conc MX (PG76-22)(BPMB-HM) GR B-M2	TON		95.50072583	96	\$ 78.53	\$ 7,499.52
403-01	Bituminous Material For Tack Coat (TC)	TON	0	7.331722222	7	\$ 777.06	\$ 5,697.19
411-01.07	ACS (PG64-22) GR "E"	TON	0	313.5	314	\$ 111.16	\$ 34,849.37
411-02.10	ACS Mix(PG70-22) Grading D	TON	0	1221	1221	\$ 113.26	\$ 138,286.03
411-03.08	ACS Mix (PG70-22) Thin Lift CS Asphalt	TON		89.58475167	90	\$ 96.75	\$ 8,667.32
PAVING TOTAL (ROUNDED)							\$ 195,000
Concrete Roads							
CONCRETE RAMPS AND ROADWAYS TOTAL (ROUNDED)							\$ -
Drainage							
607-03.30	18" Pipe Culvert	LF		300	300	\$ 52.65	\$ 15,793.57
611-09.01	ADJUSTMENT OF EXISTING CATCHBASIN	EA		5	5	\$ 736.91	\$ 3,684.54
611-09.02	REWORK CATCHBASIN	EA		7	7	\$ 1,104.68	\$ 7,732.74
611-09.03	CAPPING EXISTING CATCHBASIN	EA		7	7	\$ 1,354.35	\$ 9,480.42
611-10.01	Catch Basins, Type 10, 0' -4' Depth	EA		6	6	\$ 2,973.64	\$ 17,841.84
DRAINAGE TOTAL (ROUNDED)							\$ 54,600
Appurtenances							
202-03	Removal of Rigid Pmnt, Sidewalk, Etc	SY		820	820	\$ 9.53	\$ 7,813.10
701-01.01	Concrete Sidewalk (4")	SF	0	820	820	\$ 7.40	\$ 6,063.91
701-02.03	Concrete Handicap Ramp	SF		570	570	\$ 17.74	\$ 10,112.84
702-01	Concrete Curb	CY		25	25	\$ 334.36	\$ 8,358.93
702-03	Concrete Combined Curb & Gutter	CY	0	40	40	\$ 374.57	\$ 14,982.88
711-05.01	Removal & Disposal of Concrete Median Barrier	LF		2600	2600	\$ 152.55	\$ 396,630.00
711-05.71	51" Single Slope Concrete Barrier Wall	LF	0	2600	2600	\$ 95.30	\$ 247,777.73
ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)							\$ 691,800
Earthwork & Mineral							
203-01	Road & Drainage Excavation (Unclassified)	CY	0	9186.672652	9187	\$ 16.73	\$ 153,664.94
203-03	Borrow Excavation (Unclassified)	CY	0	11691.06056	11691	\$ 14.97	\$ 175,064.29
EARTHWORK & MINERAL TOTAL (ROUNDED)							\$ 328,800
Structures							
N/A	Removal of Bridge	SF	0	16642	16642	\$ 50.00	\$ 832,100.00
N/A	New Bridge (Steel Girder):	SF	0	18800	18800	\$ 450.00	\$ 8,460,000.00
STRUCTURES TOTAL (ROUNDED)							\$ 9,292,100
Interchanges and Unique Intersections							
INTERCHANGES AND UNIQUE INTERSECTIONS TOTAL (ROUNDED)							\$ -
Lighting & Signalization							
714-01.32	Structural Lighting	LS		1	1	\$ 9,743.29	\$ 9,743.29
714-03.01	Direct Brl Conduit (2" PVC, Schedule 40)	LF		250	250	\$ 6.67	\$ 1,666.42
714-05.04	Pull Boxes (Type C)	EA		4	4	\$ 620.37	\$ 2,481.49
714-06.05	Cable (1/C # 6 AWG)	LF		500	500	\$ 1.05	\$ 525.00
714-08.01	Light Standards (45' MH, 15' ARM)	EA		3	3	\$ 3,722.26	\$ 11,166.78
714-08.28	Found for Light Standards - Roadway	EA		3	3	\$ 1,384.42	\$ 4,153.26
714-08.30	Remove and Relocate Light Standard	EA		3	3	\$ 2,046.75	\$ 6,140.25
714-09.03	Luminaires (250 WATT)	EA		3	3	\$ 472.73	\$ 1,418.19
714-25	Electrical Connection	EA		1	1	\$ 599.06	\$ 599.06
714-26.05	Temporary Roadway Lighting	LS		1	1	\$ 6,825.00	\$ 6,825.00
730-01.02	Removal of Signal Equipment	EA		2	2	\$ 1,957.79	\$ 3,915.58
730-02.09	Signal Head Assembly (130 With Backplate)	EA		10	10	\$ 807.65	\$ 8,076.53
730-02.17	Signal Head Assembly (150 A2H With Backplate)	EA		2	2	\$ 1,313.83	\$ 2,627.67
730-03.20	Install Pull Box (Type A)	EA		4	4	\$ 385.67	\$ 1,542.67
730-03.21	Install Pull Box (Type B)	EA		4	4	\$ 481.62	\$ 1,926.47
730-05.01	Electrical Service Connection	EA		2	2	\$ 2,023.65	\$ 4,047.30
730-08.03	Signal Cable - 7 Conductor	LF		800	800	\$ 1.65	\$ 1,323.59
730-08.30	Interconnect Cable (Copper-Twisted Pair)	LF		1000	1000	\$ 2.67	\$ 2,670.00
730-12.14	Conduit 3" Diameter (Jack and Bore)	LF		400	400	\$ 25.74	\$ 10,296.16
730-12.16	Conduit (2" Conduit Schedule 80)	LF		200	200	\$ 13.80	\$ 2,760.38
730-13.01	VEHICLE LOOP DETECTOR (SHELF MOUNT)	EA		4	4	\$ 178.62	\$ 714.49
730-14.01	Shielded Detector Cable	LF		350	350	\$ 1.27	\$ 444.66
730-14.02	Saw Slot	LF		2000	2000	\$ 2.89	\$ 5,779.41
730-15.32	Cabinet (Eight Phase Base Mounted)	EA		2	2	\$ 13,544.50	\$ 27,089.00
730-16.02	Eight Phase Actuated Controller	EA		2	2	\$ 4,736.56	\$ 9,473.13
730-23.88	Cantilever Signal Support (1 ARM @ 45')	EA		3	3	\$ 14,116.19	\$ 42,348.57
730-23.96	Cantilever Signal Support (1 ARM @ 50')	EA		3	3	\$ 19,551.62	\$ 58,654.85
LIGHTING & SIGNALIZATION TOTAL (ROUNDED)							\$ 228,500
Guardrail							
705-01.01	Guardrail at Bridge Ends	LF	100		100	\$ 73.64	\$ 7,364.49
705-04.07	Tan Energy Absg Term (NCHRP, 350, TL3)	EA		4	4	\$ 2,352.59	\$ 9,410.38
705-04.09	Earth Pad for Type 38 GR End Treatment	EA		4	4	\$ 1,294.80	\$ 5,179.21
GUARDRAIL TOTAL (ROUNDED)							\$ 22,000
Seeding and Sodding							
SODDING TOTAL (ROUNDED)							\$ -
Maintenance of Traffic							
N/A	Traffic Control	LS	1		1	\$ -	\$ 145,670.52
712-02.02	Interconnected Portable Barrier Rail	LF	0	5200	5200	\$ 31.79	\$ 165,297.44
712-04.50	Portable Barrier Rail Delineator	EA		100	100	\$ 11.17	\$ 1,117.27
712-09.01	Removable Pavement Marking Line	LF		16000	16000	\$ 2.09	\$ 33,494.26
MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)							\$ 345,600
Signs							
Not Listed	Signs (Construction)	LS	1		1	\$ -	\$ 11,000
SIGNING TOTAL (ROUNDED)							\$ 11,000

PAY ITEM SUMMARY (ABC 3 - SPMT)

Pavement Markings							
716-09.31	STOP LINE	LF		200	200	\$ 16.65	\$ 3,330.00
716-13.06	Spray Thermo P.M. (40 mil 4")	LM	0.0	2	2.0	\$ 2,878.11	\$ 5,756.23
716-13.07	Spray Thermo P.M. (40 mil 6")	LM		2	2	\$ 1,237.50	\$ 2,475.00
PAVEMENT MARKINGS TOTAL (ROUNDED)							\$ 11,600
Fencing							
FENCE TOTAL (ROUNDED)							\$ -
Rip-Rap							
RIP-RAP & SLOPE PROTECTION TOTAL (ROUNDED)							\$ -
Clearing and Grubbing							
CLEAR AND GRUBBING TOTAL (ROUNDED)							\$ -
Railroad At-Grade Crossing							
RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)							\$ -
Utilities							
N/A	Overhead Distribution	LM	0.25		0.25	\$ 375,000	\$ 93,750
N/A	Overhead Transmission	LM	0.25		0.25	\$ 750,000	\$ 187,500
N/A	Underground Power	LM	0.25		0.25	\$ 500,000	\$ 125,000
N/A	Underground Communication	LM	0.25		0.25	\$ 500,000	\$ 125,000
N/A	Underground Gas	LM	0.25		0.25	\$ 250,000	\$ 62,500
N/A	Underground Water	LM	0.25		0.25	\$ 237,600	\$ 59,400
N/A	Underground Sewer	LM	0.25		0.25	\$ 310,200	\$ 77,550
UTILITIES TOTAL (ROUNDED)							\$ 730,700.00
Right-of-Way							
N/A	Right-of-Way	LS	1		1	\$ -	\$ -
RIGHT-OF-WAY TOTAL (ROUNDED)							\$ -

ATTACHMENT 1-C

Projected Traffic

PIN 124069.00

Bridge ID: 33I00240055

**TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION**

PROJECT NO.: BR-I-24-3(97) : 33003-0166-44 ROUTE: I-24 & BELVOIR AVE. BRIDGES
 COUNTY: HAMILTON CITY: CHATTANOOGA
 PROJECT PIN NUMBER: 124069.00
 PROJECT DESCRIPTION: [1] I-24 BRIDGE OVER GERMANTOWN RD @ L.M. 12.08 TRAFFIC DATA.

[2] BELVOIR AVE. BRIDGE OVER I-24 @ L.M. 1.01 TRAFFIC DATA.

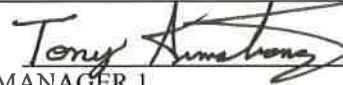
DIVISION REQUESTING:

MAINTENANCE PAVEMENT DESIGN
 S.T.I.D. STRUCTURES
 PROG. DEVELOPMENT & ADM. SURVEY & ROADWAY DESIGN
 PUBLIC TRANS. & AERO. TRAFFIC SIGNAL DESIGN
 OTHER CONSULTANT
 YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: _____
 PROJECTED LETTING DATE: _____

TRAFFIC ASSIGNMENT:

	BASE YEAR		DESIGN YEAR				DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS		
	AADT	YEAR	AADT	DHV	%	YEAR	DIR.DIST.	DHV	AADT	FLEX	RIGID
[1]	114,670	2022	142,650	12,830	9	2042	65-35	15	23	8,840	13,414
[2]	9,300	2022	10,230	1,125	11	2042	70-30	2	3	88	112

REQUESTED BY: NAME LAUREN GAINES DATE 2/14/18
 DIVISION BARGE DESIGN SOLUTIONS
 ADDRESS 615 3rd AVE. S. SUITE 700
NASHVILLE TN 37210

REVIEWED BY: TONY ARMSTRONG  DATE 2-15-18
 TRANSPORTATION MANAGER I
 SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: JIM WATERS  DATE 2-15-18
 ASSISTANT DIRECTOR
 SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

THIS TRAFFIC WAS TAKEN FROM TWO PREVIOUS PROJECTS PREPARED FOR S.T.I.D. DATED 11/28/2017 AND 1/3/2018 WITH THE ADDITION OF ADL's FOR PAVEMENT DESIGN.

DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 AADT.

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR AADTs OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.

SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS.

(REV. 2/22/17)

**TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION**

PROJECT NO.: BR-I-24-3(97) : 33003-0166-44 ROUTE NO.: I-24 [1]
 COUNTY: HAMILTON CITY: CHATTANOOGA
 PROJECT DESCRIPTION: BRIDGE OVER GERMANTOWN ROAD @ L.M. 12.08.

Interstate

Pavement Structural Design

Calculation of Equivalent Daily 18 Kip Single Axle Loads

Type Vehicle	ADT (No. Counted)	Flexible		Rigid	
		18-kip Factor	ADL	18-kip Factor	ADL
Pass. cars and motorcycles (1-2)	59,183	0.001	59	0.001	59
Pick-up, Panel, Van (3)	39,885	0.004	160	0.005	199
Sing. Unit	Buses (4)	0.300	174	0.300	174
	2-axle, 6-tire (5)	0.170	580	0.170	580
	3-axle or more (6-7)	0.700	946	1.000	1,351
Comb.	4-axle (8)	0.700	574	0.780	640
	5-axle or more (9-13)	1.100	25,776	1.780	41,711
Totals (202 AADT)	128,660		28,268		44,713

Suggested Percentages of Trucks in Design Lane

	<u>4 Lane</u>	<u>6 Lane</u>	<u>8 Lane</u>
5,000 or less ADT	90%	75%	70%
5,000 - 10,000 ADT	80%	70%	65%
10,000 - 15,000 ADT	75%	65%	60%
15,000 - 20,000 ADT	75%	65%	55%
20,000 - 30,000 ADT	70%	60%	50%
30,000 Plus ADT	65%	60%	50%

No. of Lanes: 6

% Trucks in Design Lane: 60%

ADL in Design Lane:

FLEX:	0.5	X	0.60	X	28268.0	=	8,480
RIGID:	0.5	X	0.60	X	44713.2	=	13,414

ADL Calculations By: RANDY BOGUSKIE
 Reviewed By: Tony Kumathy
 [REV. 7-1-14]

Date: 2/14/2018
 Date: 2.15.18

ATTACHMENT 1-D

Bridge TIR Tables

PIN 124069.00

Bridge ID: 33I00240055

BRIDGE TIR

Interstate 24 over
South Germantown Road

LOCATION			
Bridge #:	33I00240055	Feature Crossed:	S. Germantown Road (FAU3577)
Road Name:	I-24	Log mile:	12.08
Route ID:	I0024	System:	NHS Route
City:	Chattanooga	Functional Class:	Urban Interstate
County:	Hamilton	State Project Number	BR-I-24-3(97)
PIN:	124069.00		

ROADWAY		
	Existing	Proposed (Preliminary Design Estimate)
Design Standard		RD01-TS-5B
Route Characteristics		
AADT:	114,670	142,650
AADT Year:	2022	2042
Terrain:	Rolling	Rolling
No. Lanes:	6 total (3 in each direction)	6 total (3 in each direction)
Speed(Posted):	55	55
Speed (Design):		55
Approach Character.		
Lane Width (ft):	12	12
Shoulder Width (ft):	3 (outside) 8 (inside)	12 (outside) 8 (inside)
ROW Width (ft):	300	300
ROW Tracts Affected		0
ROW Required (acre)		n/a
Cross Section Width (ft):	94	112
Approach Length (ft):		24 - Each Approach
Alignment:	1° Curve, Vertical Curve	1° Curve, Vertical Curve
Grade:		Vertical Curve
Surface Material:	Asphalt	Asphalt
Sidewalks (R/L):	No	No
App. Lower Than Structure	No	No
Utilities (list)	OH: Distribution & Transmission; UG: Communication, Electric, Gas, & Water;	OH: Distribution & Transmission; UG: Communication, Gas, & Water;
Utilities to be Relocated		OH: Distribution & Transmission; UG: Communication & Water;
Comments		

BRIDGE TIR

Interstate 24 over
South Germantown Road

STRUCTURE (BASELINE: TRADITIONAL CONSTRUCTION)		
	Existing	Proposed (Preliminary Design Estimate)
Bridge Characteristics		
Year Built	1965	
Load Limit	20 tons	
Sufficiency Rating	30.9	
Skew	79°	79°
Structure Type	Span Concrete Bridge	Span Concrete Bridge
Structures in Channel	n/a	n/a
Length (ft)	166	166
No. Spans (App./Main)	0 4	0 4
Width (curb to curb) (ft)	94.1	121.58
Width (o to o) (ft)	100.33	124.08
Sidewalks on Structure	No	No
Vert. Clearance (ft)	14.44	TBD
Superstructure Depth (in)	51.5	28
Girder Depth (in)	38	18
Finish Grade-Low Girder (in)	51.5	28
High Water Marks	n/a	
Bridge Rail Type	STD-1-1	STD-1-1
Bridge Rail Height (ft)	2.67	3
Indication Overtopping	n/a	
Local Scour	No	
Obstructions	n/a	
Other Structures		stream running in pipe under Interstate 24; not anticipated to be impacted by this project.
Comments		Construction Manager/General Contractor (CM/GC) Project

BRIDGE TIR

Interstate 24 over
South Germantown Road

STRUCTURE (ALTERNATE #1: ABC PRE-CAST BOX BEAMS)		
	Existing	Proposed (Preliminary Design Estimate)
Bridge Characteristics		
Year Built	1965	
Load Limit	20 tons	
Sufficiency Rating	30.9	
Skew	79°	79°
Structure Type	Span Concrete Bridge	Span Concrete Bridge
Structures in Channel	n/a	n/a
Length (ft)	166	166
No. Spans (App./Main)	0 4	0 4
Width (curb to curb) (ft)	94.1	110.75
Width (o to o) (ft)	100.33	113.25
Sidewalks on Structure	No	No
Vert. Clearance (ft)	14.44	TBD
Superstructure Depth (in)	51.5	28
Girder Depth (in)	38	18
Finish Grade-Low Girder (in)	51.5	28
High Water Marks	n/a	
Bridge Rail Type	STD-1-1	STD-1-1
Bridge Rail Height (ft)	2.67	3
Indication Overtopping	n/a	
Local Scour	No	
Obstructions	n/a	
Other Structures		stream running in pipe under Interstate 24; not anticipated to be impacted by this project.
Comments		Construction Manager/General Contractor (CM/GC) Project

BRIDGE TIR

Interstate 24 over
South Germantown Road

STRUCTURE (ALTERNATE #2: LATERAL SLIDE CONSTRUCTION)		
	Existing	Proposed (Preliminary Design Estimate)
Bridge Characteristics		
Year Built	1965	
Load Limit	20 tons	
Sufficiency Rating	30.9	
Skew	79°	79°
Structure Type	Span Concrete Bridge	Span Steel (WPG) Bridge
Structures in Channel	n/a	n/a
Length (ft)	166	166
No. Spans (App./Main)	0 4	0 2
Width (curb to curb) (ft)	94.1	112
Width (o to o) (ft)	100.33	113.25
Sidewalks on Structure	No	No
Vert. Clearance (ft)	14.44	TBD
Superstructure Depth (in)	51.5	46
Girder Depth (in)	38	36
Finish Grade-Low Girder (in)	51.5	46
High Water Marks	n/a	
Bridge Rail Type	STD-1-1	STD-1-1
Bridge Rail Height (ft)	2.67	3
Indication Overtopping	n/a	
Local Scour	No	
Obstructions	n/a	
Other Structures		stream running in pipe under Interstate 24; not anticipated to be impacted by this project.
Comments		Construction Manager/General Contractor (CM/GC) Project

BRIDGE TIR

Interstate 24 over
South Germantown Road

STRUCTURE (ALTERNATE #3: SPMT CONSTRUCTION)		
	Existing	Proposed (Preliminary Design Estimate)
Bridge Characteristics		
Year Built	1965	
Load Limit	20 tons	
Sufficiency Rating	30.9	
Skew	79°	79°
Structure Type	Span Concrete Bridge	Span Steel (WPG) Bridge
Structures in Channel	n/a	n/a
Length (ft)	166	166
No. Spans (App./Main)	0 4	0 2
Width (curb to curb) (ft)	94.1	112
Width (o to o) (ft)	100.33	113.25
Sidewalks on Structure	No	No
Vert. Clearance (ft)	14.44	TBD
Superstructure Depth (in)	51.5	46
Girder Depth (in)	38	36
Finish Grade-Low Girder (in)	51.5	46
High Water Marks	n/a	
Bridge Rail Type	STD-1-1	STD-1-1
Bridge Rail Height (ft)	2.67	3
Indication Overtopping	n/a	
Local Scour	No	
Obstructions	n/a	
Other Structures		stream running in pipe under Interstate 24; not anticipated to be impacted by this project.
Comments		Construction Manager/General Contractor (CM/GC) Project

FLOW RATES (from USGS StreamStats Program Version 3)

Drainage Area (sq. miles)	0.38
10 Year Discharge Rate (Q10) cfs	154
50 Year Discharge Rate (Q50) cfs	240
100 Year Discharge Rate (Q100) cfs	284

CHANNEL

Depth (ft)	n/a
Width of Normal Flow (ft)	n/a
Depth of Normal Flow (ft)	n/a
Skew of Channel with Roadway	n/a
Type of Material in Stream Bed	n/a
Type of Vegetation on Banks	n/a
Are Channel Banks Stable	n/a
Signs of Stream Aggradation	n/a
Signs of Stream Degradation	n/a
Drift or Drift Potential	n/a
Comments	

FLOODPLAIN

Skew Same as Channel	n/a
Symmetrical About Channel	n/a
Approx. Floor Elevations	n/a
Type of Vegetation in Floodplain	n/a
Any Buildings in Floodplain	n/a
Flood Information From Locals	n/a
Comments	According to the FEMA Map, there is not a floodplain in the area of the site.

MAINTENANCE OF TRAFFIC

Method of Maintaining Traffic	temporary detour
Description	<u>Temporary detour/On site detour/Shift centerline</u> : there are currently 4 various options for construction phasing. Two (2) options include types of road closures, and two (2) other options include shifting traffic in different stages. The official traffic control will be decided once a CM (construction manager) is on board.
Comments	Construction Manager/General Contractor (CM/GC) Project

BRIDGE TIR

Interstate 24 over
South Germantown Road

SITE VISIT ATTENDEES			DATE: 4/5/2018
Name	Organization	Phone	Email
Mike Gilbert	TDOT STID	615.741.0772	michael.gilbert@tn.gov
Jeremy Sims	TDOT Region 2	423.510.1227	jeremy.sims@tn.gov
Alan Wolfe	TDOT Region 2 Traffic	423.510.1139	alan.wolfe@tn.gov
Zach Johnson	TDOT Region 2 Traffic	423.510.6914	zach.johnson@tn.gov
Robert Rodgers	TDOT Region 2 Design	423.510.1138	robert.rodger@tn.gov
Michael Cloud	TDOT Region 2	615.532.1676	michael.cloud@tn.gov
Garris Bugg	TDOT Region 2		garris.bugg@tn.gov
Wade Goss	TDOT Region 2		wade.goss@tn.gov
Ben Taylor	City of Chattanooga	423.643.5557	bgtaylor@chattanooga.gov
Wes Hughen	TDOT Region 2	423.510.1133	wesley.hughen@tn.gov
Adam Casteel	TDOT R2 Operations	423.208.6113	adam.casteel@tn.gov
Jamie Fitzpatrick	TDOT HQ Construction	615.741.0781	jamie.fitzpatrick@tn.gov
Robert LeFevre	TDOT Structures	615.741.0798	robert.lefevre@tn.gov
Nitaya Chayangkura	TDOT HQ Construction	615.532.8848	nitaya.chayangkura@tn.gov
Joe Deering	TDOT Region 2	423.892.3430	joe.deering@tn.gov
Gary Chapman	TDOT Region 2 Survey	423.510.1144	gary.chapman@tn.gov
Ken Flynn	TDOT R2 Operations	423.510.1217	ken.flynn@tn.gov
Scott Medlin	TDOT R2 Environmental	423.570.1118	scott.medlin@tn.gov
Doug Ford	TDOT Region 2 Survey	423.298.3279	douglas.ford@tn.gov
Jonathan Haycraft	Barge Design	615.252.4242	jonathan.haycraft@bargedesign.com
Kevin McAlister	Barge Design	615.252.4294	kevin.mcalister@bargedesign.com
Lauren Gaines	Barge Design	615.252.4243	lauren.gaines@bargedesign.com
Patrick Leap	Barge Design	615.252.4260	patrick.leap@bargedesign.com

ATTACHMENT 1-E

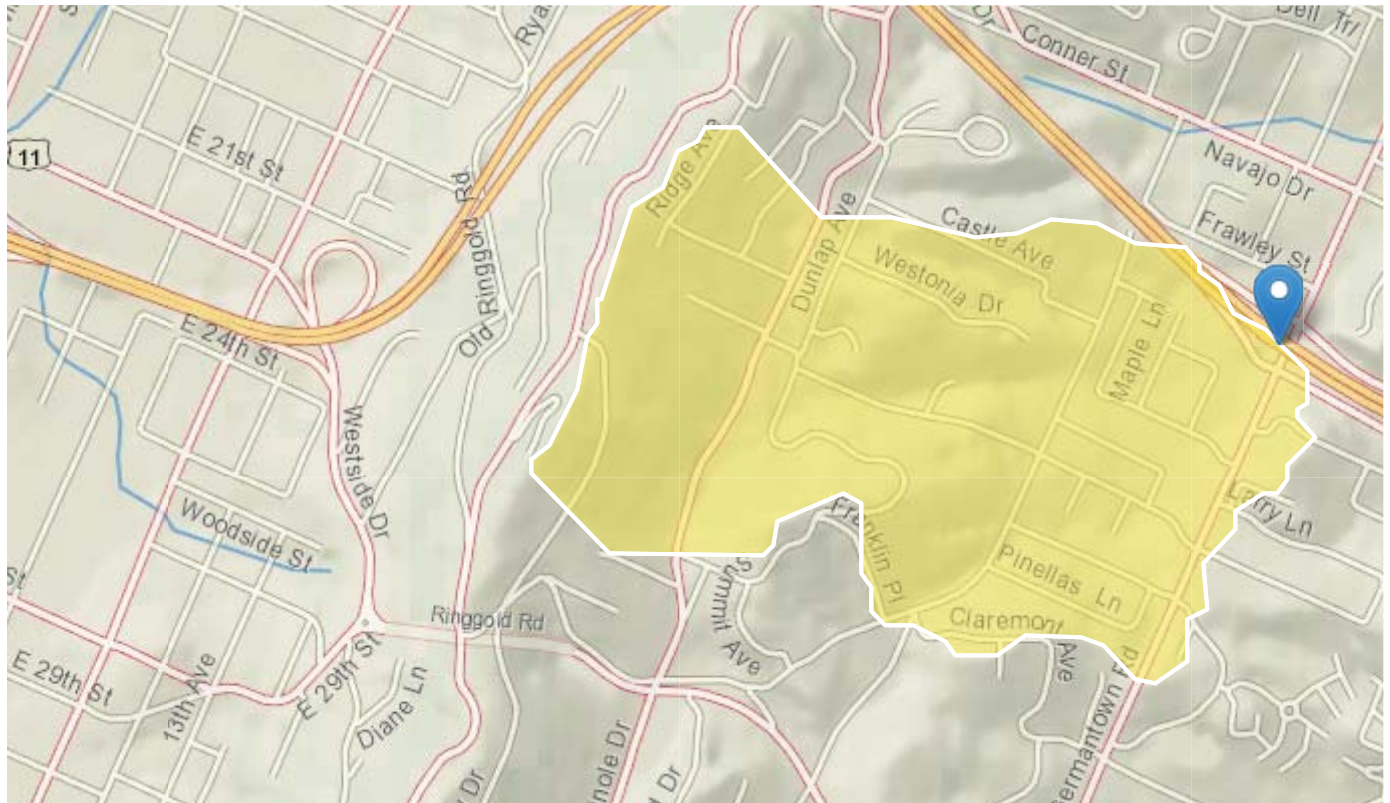
Stream Stats

PIN 124069.00

Bridge ID: 33I00240055

StreamStats Report

Region ID: TN
Workspace ID: TN20180205194623319000
Clicked Point (Latitude, Longitude): 35.01425, -85.25202
Time: 2018-02-05 13:46:37 -0600



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CONDA	Area that contributes flow to a point on a stream	0.38	square miles
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	209.22	feet per mi
CLIMFAC2YR	Two-year climate factor from Lichy and Karlinger (1990)	2.351	dimensionless
DRNAREA	Area that drains to a point on a stream	0.38	square miles
RECESS	Number of days required for streamflow to recede one order of magnitude when hydrograph is plotted on logarithmic scale	112	days per log cycle
SOILPERM	Average Soil Permeability	1.97	inches per hour
PERMGTE2IN	Percent of area underlain by soils with permeability greater than or equal to 2 inches per hour	100.005	percent

Peak-Flow Statistics Parameters [MultiVariable Area 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CONTDA	Contributing Drainage Area	0.38	square miles	0.2	9000
CSL10_85	Stream Slope 10 and 85 Method	209.22	feet per mi	3.29	950
CLIMFAC2YR	Tennessee Climate Factor 2 Year	2.351	dimensionless	2.06	2.32

Peak-Flow Statistics Disclaimers [MultiVariable Area 1]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report [MultiVariable Area 1]

Statistic	Value	Unit
2 Year Peak Flood	72.6	ft ³ /s
5 Year Peak Flood	119	ft ³ /s
10 Year Peak Flood	154	ft ³ /s
25 Year Peak Flood	203	ft ³ /s
50 Year Peak Flood	240	ft ³ /s
100 Year Peak Flood	284	ft ³ /s
500 Year Peak Flood	388	ft ³ /s

Peak-Flow Statistics Citations

Law, G.S., and Tasker G.D., 2003, Flood-Frequency Prediction Methods for Unregulated Streams of Tennessee, 2000: U.S. Geological Survey Water-Resources Investigations Report 03-4176, 79p. (<http://pubs.usgs.gov/wri/wri034176/>)

Low-Flow Statistics Parameters [Low Flow Central and East Regions 2009 5159]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.38	square miles	1.3	14441
RECESS	Recession Index	112	days per log cycle	32	175
CLIMFAC2YR	Tennessee Climate Factor 2 Year	2.351	dimensionless	2.056	2.46
SOILPERM	Average Soil Permeability	1.97	inches per hour	0.45	9.72
PERMGTE2IN	Percent permeability gte 2 in per hr	100.005	percent	2	100

Low-Flow Statistics Disclaimers [Low Flow Central and East Regions 2009 5159]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report [Low Flow Central and East Regions 2009 5159]

Statistic	Value	Unit
7 Day 10 Year Low Flow	0.0555	ft ³ /s
30 Day 5 Year Low Flow	0.0746	ft ³ /s

Low-Flow Statistics Citations

Law, G.S., Tasker, G.D., and Ladd, D.E., 2009, Streamflow-characteristic estimation methods for unregulated streams of Tennessee: U.S. Geological Survey Scientific Investigations Report 2009-5159, 212 p., 1 pl. (<http://pubs.usgs.gov/sir/2009/5159/>)

Annual Flow Statistics Parameters [Low Flow Central and East Regions 2009 5159]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.38	square miles	1.3	14441
CLIMFAC2YR	Tennessee Climate Factor 2 Year	2.351	dimensionless	2.056	2.46
SOILPERM	Average Soil Permeability	1.97	inches per hour	0.45	9.72

Annual Flow Statistics Disclaimers [Low Flow Central and East Regions 2009 5159]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Annual Flow Statistics Flow Report [Low Flow Central and East Regions 2009 5159]

Statistic	Value	Unit
Mean Annual Flow	0.62	ft ³ /s

Annual Flow Statistics Citations

Law, G.S., Tasker, G.D., and Ladd, D.E., 2009, Streamflow-characteristic estimation methods for unregulated streams of Tennessee: U.S. Geological Survey Scientific Investigations Report 2009-5159, 212 p., 1 pl. (<http://pubs.usgs.gov/sir/2009/5159/>)

Seasonal Flow Statistics Parameters [Low Flow Central and East Regions 2009 5159]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.38	square miles	1.3	14441
RECESS	Recession Index	112	days per log cycle	32	175
CLIMFAC2YR	Tennessee Climate Factor 2 Year	2.351	dimensionless	2.056	2.46
SOILPERM	Average Soil Permeability	1.97	inches per hour	0.45	9.72

Seasonal Flow Statistics Disclaimers [Low Flow Central and East Regions 2009 5159]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Seasonal Flow Statistics Flow Report [Low Flow Central and East Regions 2009 5159]

Statistic	Value	Unit
Summer Mean Flow	0.241	ft ³ /s

Seasonal Flow Statistics Citations

Law, G.S., Tasker, G.D., and Ladd, D.E., 2009, **Streamflow-characteristic estimation methods for unregulated streams of Tennessee: U.S. Geological Survey Scientific Investigations Report 2009–5159, 212 p., 1 pl.** (<http://pubs.usgs.gov/sir/2009/5159/>)

Flow-Duration Statistics Parameters [Low Flow Central and East Regions 2009 5159]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.38	square miles	1.3	14441
RECESS	Recession Index	112	days per log cycle	32	175
CLIMFAC2YR	Tennessee Climate Factor 2 Year	2.351	dimensionless	2.056	2.46
SOILPERM	Average Soil Permeability	1.97	inches per hour	0.45	9.72
PERMGTE2IN	Percent permeability gte 2 in per hr	100.005	percent	2	100

Flow-Duration Statistics Disclaimers [Low Flow Central and East Regions 2009 5159]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Flow-Duration Statistics Flow Report [Low Flow Central and East Regions 2009 5159]

Statistic	Value	Unit
99.5 Percent Duration	0.0533	ft ³ /s
99 Percent Duration	0.0571	ft ³ /s
98 Percent Duration	0.0648	ft ³ /s
95 Percent Duration	0.0745	ft ³ /s
90 Percent Duration	0.0876	ft ³ /s
80 Percent Duration	0.104	ft ³ /s
70 Percent Duration	0.133	ft ³ /s
60 Percent Duration	0.174	ft ³ /s
50 Percent Duration	0.242	ft ³ /s
40 Percent Duration	0.35	ft ³ /s
30 Percent Duration	0.509	ft ³ /s

Statistic	Value	Unit
20 Percent Duration	0.756	ft ³ /s
10 Percent Duration	1.23	ft ³ /s

Flow-Duration Statistics Citations

Law, G.S., Tasker, G.D., and Ladd, D.E., 2009, Streamflow-characteristic estimation methods for unregulated streams of Tennessee: U.S. Geological Survey Scientific Investigations Report 2009-5159, 212 p., 1 pl. (<http://pubs.usgs.gov/sir/2009/5159/>)

ATTACHMENT 1-F

FEMA Map

PIN 124069.00

Bridge ID: 33I00240055

ATTACHMENT 1-G

Site Photos

PIN 124069.00

Bridge ID: 33I00240055

Interstate 24 over
South Germantown Road



Looking East over Bridge



Looking East over Bridge

Interstate 24 over
South Germantown Road



Looking South under Bridge



Looking at Abutment No. 1



Looking at Abutment No. 2



Looking at Abutment No. 2



Looking at Bents No. 1 and No. 2



Underside of Bent Cap



Widened Bent Caps



Abutment No. 2



Abutment No. 2



Abutment No. 1

Interstate 24 over
South Germantown Road



Looking North under the Bridge



Drain at Southwest side of Bridge



Looking East at On-Ramp



Looking at Bent No. 1

Interstate 24 over
South Germantown Road



Overhead Utilities



Utilities Mounted to Bridge



Abutment No. 1



Looking under Bridge at Bents



Concrete Slope Paving



Looking at Underside of Deck



Looking at Bent and Beam Supports



Sidewalk Under Bridge



Looking at North at Bent No. 3



Looking North at Bent No. 2

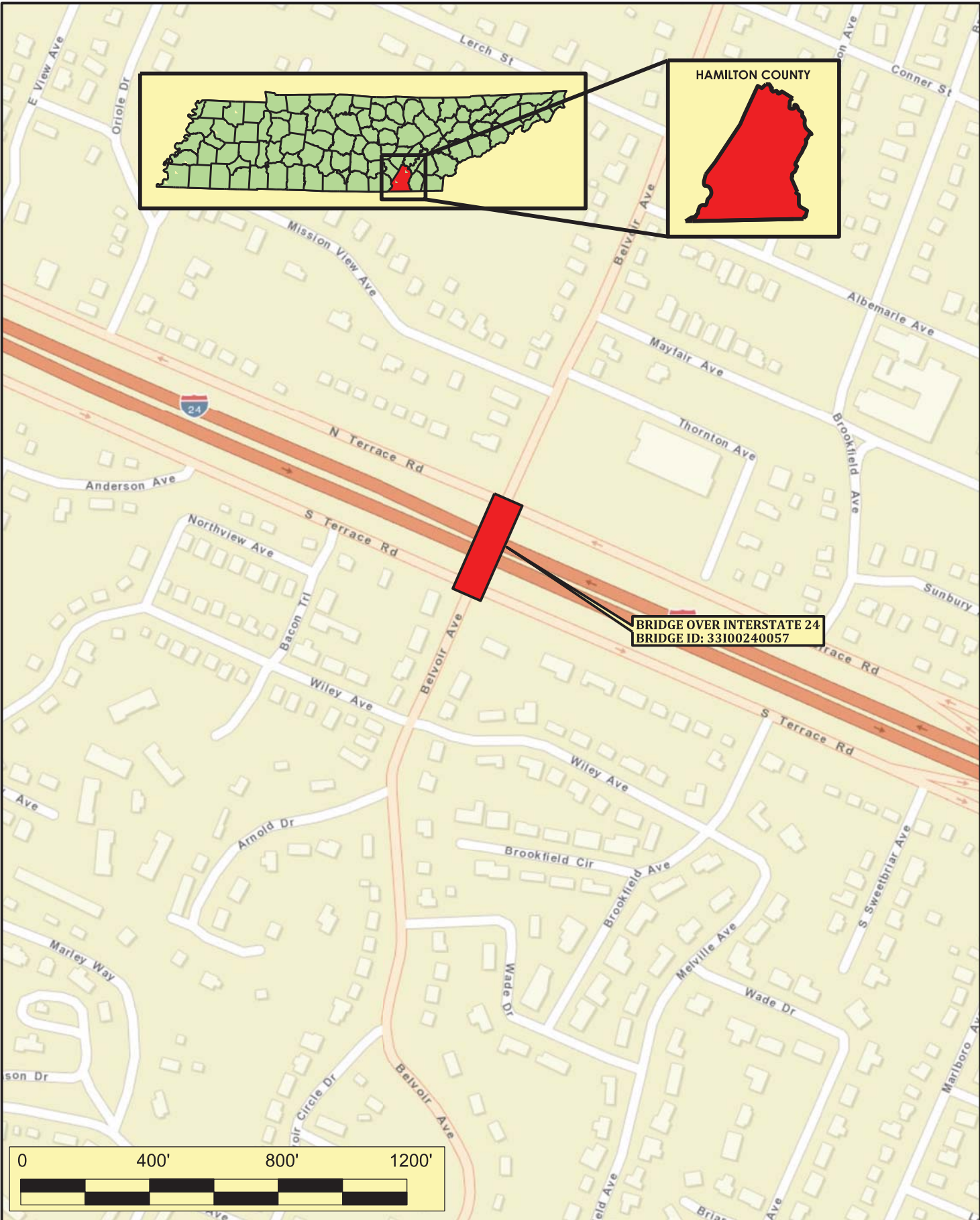
SECTION 2

Belvoir Avenue Bridge

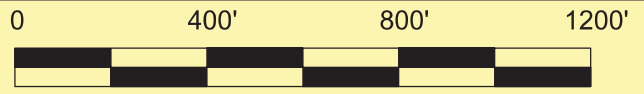
over Interstate 24

PIN 124069.00

Bridge ID: 33I00240057



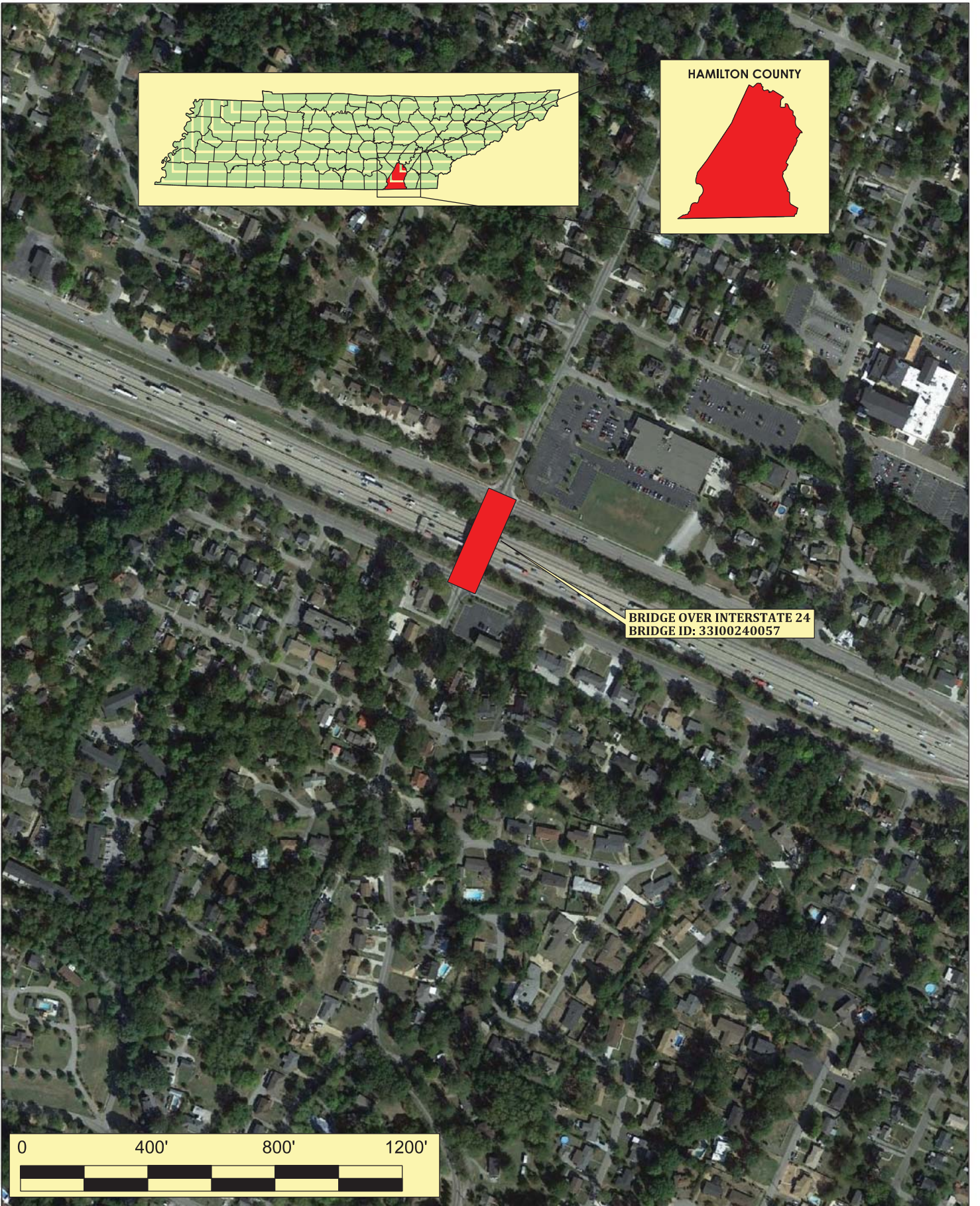
BRIDGE OVER INTERSTATE 24
BRIDGE ID: 33100240057



AREA MAP
BRIDGE TIR
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY

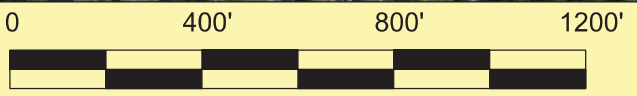


TDOT
Department of
Transportation



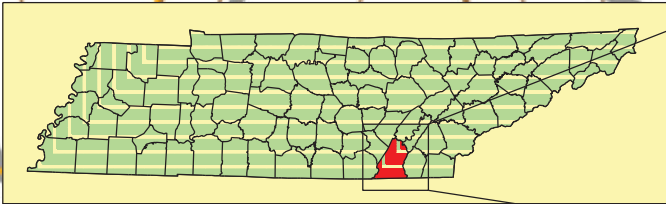
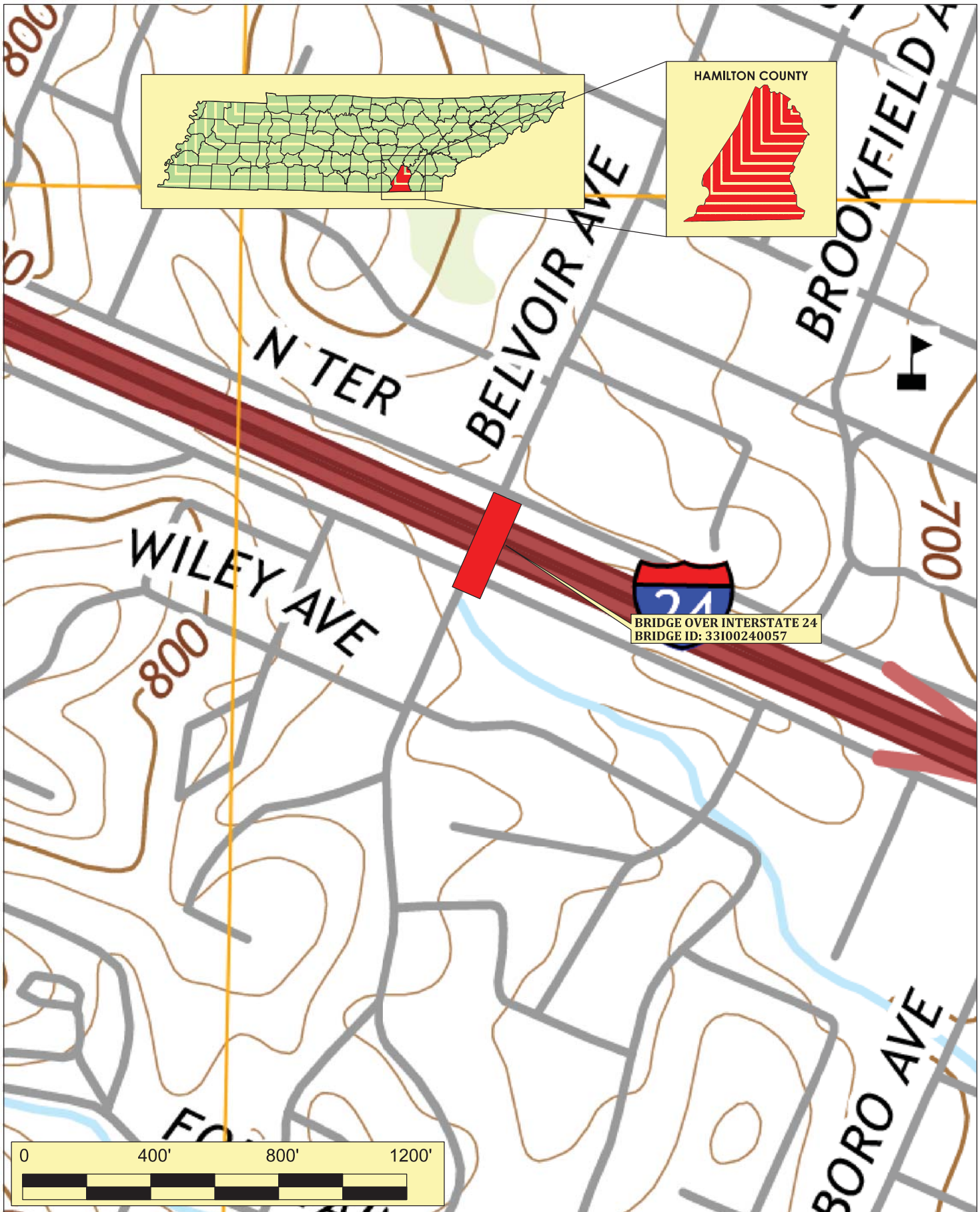
HAMILTON COUNTY

BRIDGE OVER INTERSTATE 24
BRIDGE ID: 33100240057



LOCATION MAP
BRIDGE TIR
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY





BRIDGE OVER INTERSTATE 24
BRIDGE ID: 33100240057



TOPOGRAPHIC MAP
BRIDGE TIR
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY





STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION
SUITE 1000, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TN 37243
(615) 741-2208

JOHN C. SCHROER
COMMISSIONER

BILL HASLAM
GOVERNOR

MEMORANDUM

TO: Steve Allen, Transportation Director
Strategic Transportation Investments Division

FROM: Lia Obaid, Asst. Director of Construction
Construction Division

DATE: June 11, 2018

SUBJECT: TIR Field Review (Special Bridge Replacement Program)
Belvoir Avenue Bridge over Interstate 24
Log Mile 1.01
Bridge ID: 33I00240057
Hamilton County
PIN 124069.00

A field review was held for the above-mentioned project on Thursday, April 5, 2018.

The existing structure is a four (4) span prestressed concrete bridge that is 190.5 feet long at a 90 degree skew with four (4), twelve (12) foot lanes, ten (10) foot shoulders, and five (5) foot sidewalks. The current right of way (R.O.W.) is 80 feet. The current posted speed on Belvoir Avenue is 30 miles per hour. This structure crosses Interstate 24 in Hamilton County and is within Chattanooga city limits. The existing structure has an out-to-out width of 79.5 feet. The sufficiency rating of this bridge is 86.6.

The proposed bridge will be designed to meet TDOT standard RD01-TS-6A. The proposed centerline will remain the same. The bridge will be closed during construction and traffic will be detoured to local streets. See the functional plans in the executive summary for a detour map. The route has a 2022 base year AADT of 9,300 vehicles per day and a 2042 design year AADT of 10,230 vehicles per day. The proposed structure will be a two (2) span bridge that is 152 feet long at a 90° skew. The proposed typical section consists of four (4) eleven (11) foot lanes, two (2) foot outside shoulders, six (6) inch curbs, and six (6) foot sidewalks. At the request of

TDOT's Region 2 office, the proposed substructure will be designed and built to accommodate future road widening along Interstate 24 below the Belvoir Avenue bridge. The proposed structure is narrower than the existing structure. This is due to the ten (10) foot shoulders being removed from the bridge and the lanes being narrowed from twelve (12) to eleven (11) feet. The proposed structure is also shorter than the existing structure. This is due to a retaining wall being placed under the bridge. It is the opinion of the TDOT and the City of Chattanooga that narrower lanes will slow down traffic through this area which is residential in nature thereby increasing safety along the route. No additional R.O.W. is anticipated and utilities will be relocated as necessary. An overhead message sign may also need to be replaced along Interstate 24 as part of this project (and has been included in the cost estimate). The posted speed is anticipated to remain 30 mph. The project will tie into Belvoir Avenue by mill and overlay.

Both intersections on either side of the bridge will be updated to meet current signal and American with Disabilities Act (ADA) design standards.

The bridge has been selected for replacement utilizing the CM/GC (Construction Manager/General Contractor) Method for design phase and the ABC (Accelerated Bridge Construction) technique for the construction phase in an effort to minimize negative long-term traffic impacts during construction. At this time the design team is anticipating closing the Belvoir Avenue bridge to local traffic during the construction phase, but this is subject to change as the design phase continues. A preliminary detour map is attached. It is not the intention of the design team to have simultaneous lane closures and detours for both bridges. However, this analysis is also subject to change during the CM/GC design process. Once a CM (Construction Manager) has been selected, the formal design process will begin and a final traffic control plan will be determined.

The total cost for this bridge replacement, including approach work, estimated replacement, and preliminary engineering, is approximately \$5,125,000. A man day estimate cannot be conducted until the CM (Construction Manager) is selected for the project.

ATTACHMENT 2-A

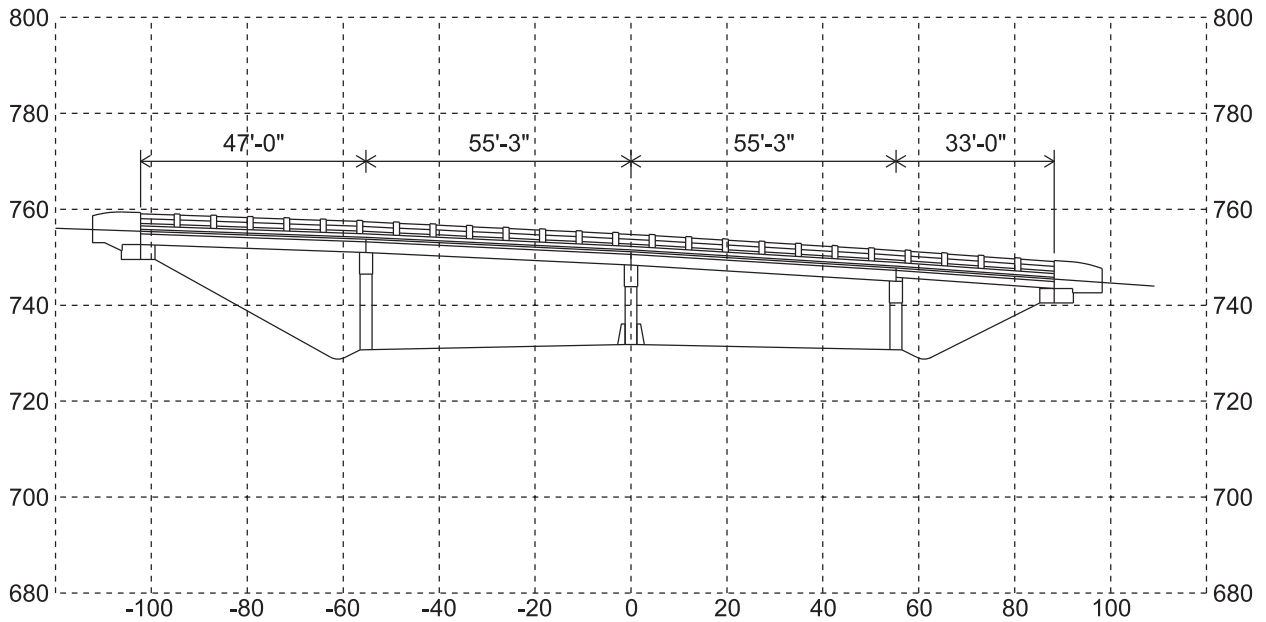
Bridge Figures

PIN 124069.00

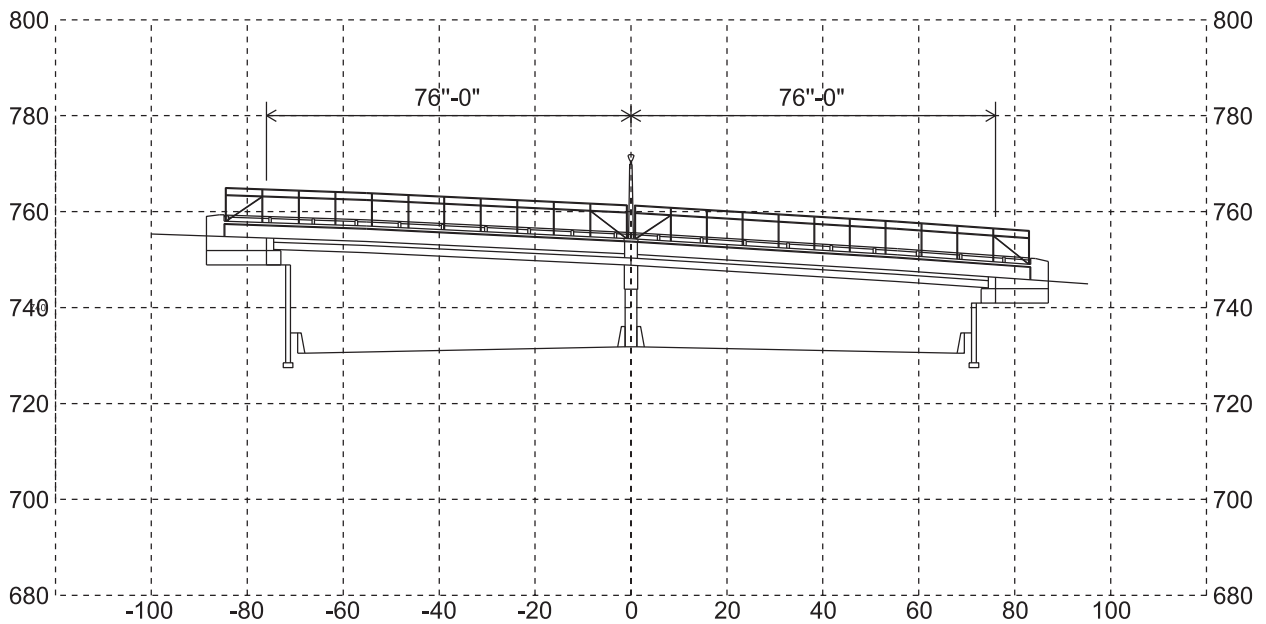
Bridge ID: 33100240057

BELVOIR AVENUE BRIDGE OVER INTERSTATE 24

EXISTING STRUCTURE (OUTLET)



PROPOSED STRUCTURE (OUTLET)

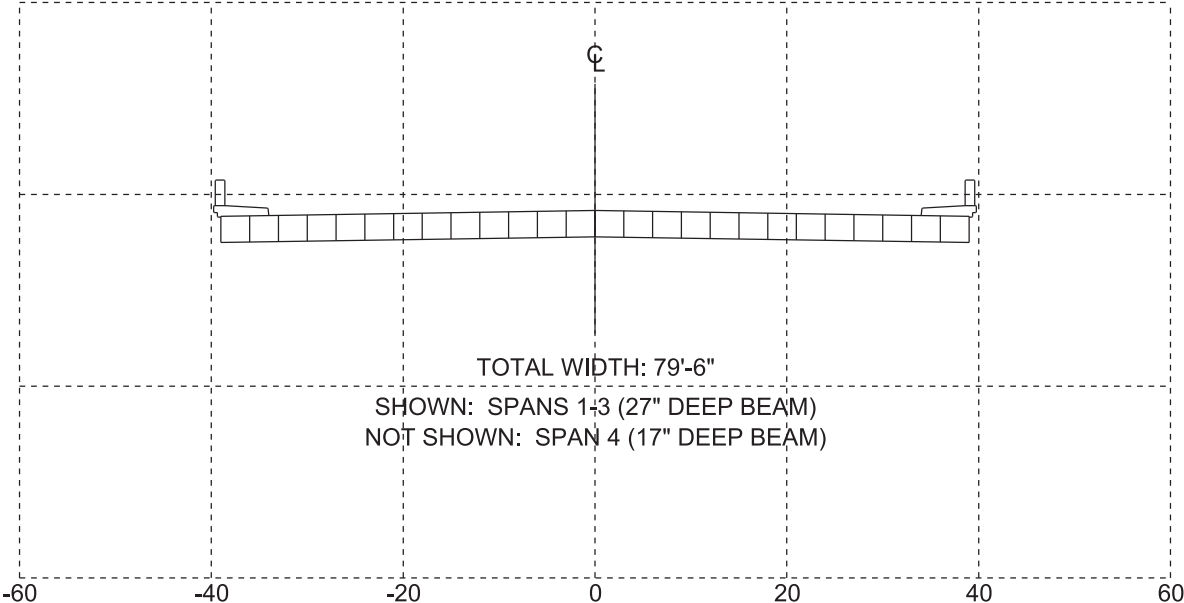


PROFILE

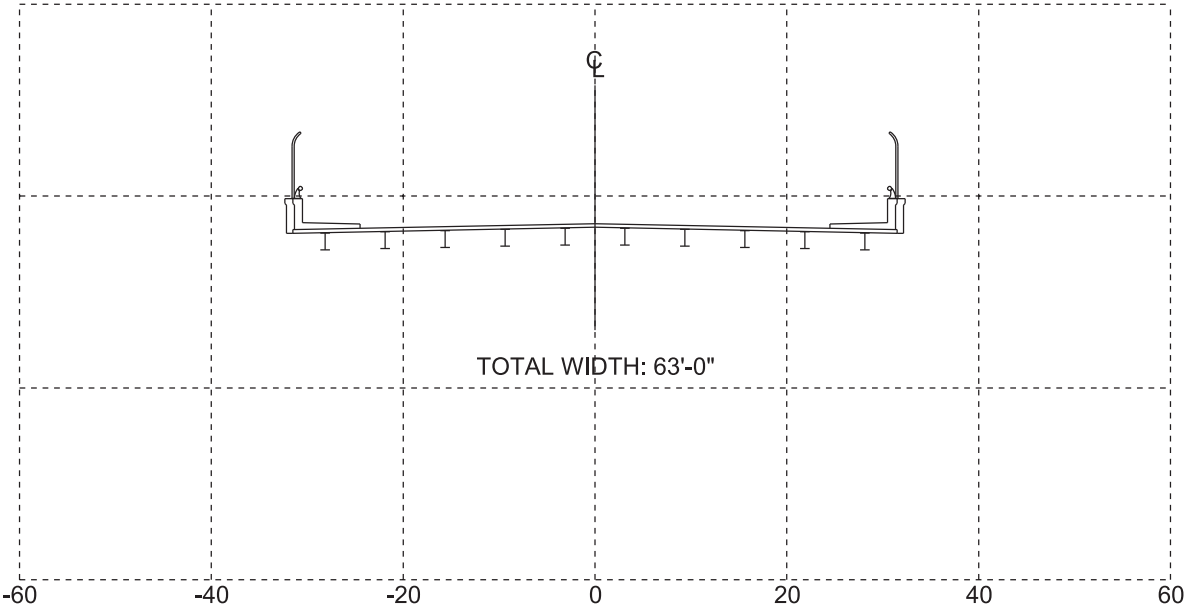
PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY

BELVOIR AVENUE BRIDGE OVER INTERSTATE 24

EXISTING STRUCTURE



PROPOSED STRUCTURE



TYPICAL SECTION

PIN 124069.00
I-24 OVER S. GERMANTOWN ROAD CM/GC PROJECT
HAMILTON COUNTY

ATTACHMENT 2-B

Preliminary Cost Estimate

PIN 124069.00

Bridge ID: 33I00240057

COST ESTIMATE SUMMARY

(BELVOIR AVE - TRADITIONAL CONSTRUCTION)

Route:	Belvoir Avenue Bridge over Interstate 24	
Description:	PIN 124069.00 - Interstate 24 over Germantown Rd (CM/GC)	
County:	Log Mile 1.01	
Length:	Hamilton	
Date:	June 11, 2018	

DESCRIPTION	LOCAL 0%	STATE 0%	FEDERAL 100%	TOTAL
Construction Items				
Pavement Removal	\$0	\$0	\$85,100	\$85,100
Asphalt Paving	\$0	\$0	\$108,600	\$108,600
Concrete Pavement	\$0	\$0	\$0	\$0
Drainage	\$0	\$0	\$1,500	\$1,500
Appurtenances	\$0	\$0	\$25,300	\$25,300
Structures	\$0	\$0	\$2,456,700	\$2,456,700
Fencing	\$0	\$0	\$72,600	\$72,600
Signalization	\$0	\$0	\$430,900	\$430,900
Railroad Crossing or Separation	\$0	\$0	\$0	\$0
Earthwork	\$0	\$0	\$33,100	\$33,100
Clearing and Grubbing	\$0	\$0	\$0	\$0
Seeding & Sodding	\$0	\$0	\$0	\$0
Rip-Rap or Slope Protection	\$0	\$0	\$0	\$0
Guardrail	\$0	\$0	\$22,000	\$22,000
Signing	\$0	\$0	\$3,200	\$3,200
Pavement Markings ⁽¹⁾	\$0	\$0	\$9,100	\$9,100
Maintenance of Traffic	\$0	\$0	\$85,400	\$85,400
Mobilization (5%)	\$0	\$0	\$166,700	\$166,700
Other Items ⁽²⁾ = 10%	\$0	\$0	\$350,000	\$350,000
Const. Contingency ⁽²⁾ = 15%	\$0	\$0	\$209,000	\$209,000
Construction Estimate	\$0	\$0	\$4,059,200	\$4,059,200
Interchanges & Unique Intersections				
Roundabouts	\$0	\$0	\$0	\$0
Interchanges	\$0	\$0	\$0	\$0
Right-of-Way & Utilities	LOCAL 0%	STATE 0%	FEDERAL 100%	TOTAL
Right-of-Way	\$0	\$0	\$0	\$0
Utilities	\$0	\$0	\$211,300	\$211,300
Preliminary & Construction Engineering and Inspection				
Prelim. Eng. 10%	\$0	\$0	\$427,100	\$427,100
Const. Eng. & Inspec. 10%	\$0	\$0	\$427,100	\$427,100
Total Project Cost	\$0	\$0	\$5,124,700	\$ 5,125,000

⁽¹⁾ Additional quantities were added to the 'Pavement Markings' pay item to account for temporary traffic control.

⁽²⁾ 'Other Items' and 'Const. Contingency' were not increased to account for CM/GC method. There is no plan at this time to build the Belvoir

PAY ITEM SUMMARY (BELVOIR AVE - TRADITIONAL CONSTRUCTION)

TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	TOOL QUANTITIES	ADDITIONAL QUANTITIES	TOOL QUANTITIES + ADDITIONAL QUANTITIES	Statewide UNIT COST	TOTAL COST
Pavment Removal							
415-01.02	Cold Planning Bituminous Pavement	SY	0	11568	11568	\$ 7.35	\$ 85,064.06
PAVEMENT REMOVAL TOTAL (ROUNDED)							\$ 85,100
Asphalt Roads							
403-01	Bituminous Material For Tack Coat (TC)	TON	0	5	5	\$ 778.44	\$ 3,892.20
411-02.10	ACS Mix(PG70-22) Grading D	TON	0	920	920	\$ 113.78	\$ 104,678.90
PAVING TOTAL (ROUNDED)							\$ 108,600
Concrete Roads							
CONCRETE RAMPS AND ROADWAYS TOTAL (ROUNDED)							\$ -
Drainage							
611-09.01	ADJUSTMENT OF EXISTING CATCHBASIN	EA		2	2	\$ 736.91	\$ 1,473.82
DRAINAGE TOTAL (ROUNDED)							\$ 1,500
Appurtenances							
202-03	Removal of Rigid Pvmnt, Sidewalk, Etc	SY		240	240	\$ 9.53	\$ 2,286.76
701-01.01	Concrete Sidewalk (4")	SF	0	240	240	\$ 7.41	\$ 1,778.93
701-02.03	Concrete Handicap Ramp	SF		890	890	\$ 17.74	\$ 15,790.22
702-01	Concrete Curb	CY		16	16	\$ 334.36	\$ 5,349.72
ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)							\$ 25,300
Earthwork & Mineral							
203-01	Road & Drainage Excavation (Unclassified)	CY	0	918.667	919	\$ 16.79	\$ 15,428.43
203-03	Borrow Excavation (Unclassified)	CY	0	1169.106	1169	\$ 15.04	\$ 17,584.91
EARTHWORK & MINERAL TOTAL (ROUNDED)							\$ 33,100
Structures							
604-07.01	Retaining Wall	SF		4000	4000	\$ 95.00	\$ 380,000.00
N/A	Removal of Bridge	SF	0	15145	15145	\$ 50.00	\$ 757,250.00
N/A	New Bridge (Steel)	SF	0	9424	9424	\$ 140.00	\$ 1,319,360.00
STRUCTURES TOTAL (ROUNDED)							\$ 2,456,700
Interchanges and Unique Intersections							
INTERCHANGES AND UNIQUE INTERSECTIONS TOTAL (ROUNDED)							\$ -
Lighting & Signalization							
714-01.32	Structural Lighting	LS		1	1	\$ 9,743.29	\$ 9,743.29
714-03.01	Direct Brl Conduit (2" PVC, Schedule 40)	LF		250	250	\$ 6.67	\$ 1,666.42
714-05.04	Pull Boxes (Type C)	EA		4	4	\$ 620.37	\$ 2,481.49
714-06.05	Cable (1/C # 6 AWG)	LF		500	500	\$ 1.05	\$ 525.00
714-08.01	Light Standards (45' MH, 15' ARM)	EA		3	3	\$ 3,722.26	\$ 11,166.78
714-08.28	Found for Light Standards - Roadway	EA		3	3	\$ 1,384.42	\$ 4,153.26
714-08.30	Remove and Relocate Light Standard	EA		3	3	\$ 2,046.75	\$ 6,140.25
714-09.03	Luminaires (250 WATT)	EA		3	3	\$ 472.73	\$ 1,418.19
714-25	Electrical Connection	EA		1	1	\$ 599.06	\$ 599.06
714-26.05	Temporary Roadway Lighting	LS		1	1	\$ 6,825.00	\$ 6,825.00
725-20.24	Steel Overhead Sign Structure (Spans 91ft to 110ft)	EA		1	1	\$ 80,000.00	\$ 80,000.00
725-20.44	Pull Box (Type D)	EA		1	1	\$ 1,400.00	\$ 1,400.00
725-20.45	Pull Box (Type E)	EA		2	2	\$ 1,700.00	\$ 3,400.00
725-20.75	Communication Connection (Temp Comm Connections)	LS		1	1	\$ 3,000.00	\$ 3,000.00
725-21.01	Dynamic Messaging Sign	EA		1	1	\$ 80,000.00	\$ 80,000.00
725-21.04	Dynamic Messaging Sign Removal	EA		1	1	\$ 10,000.00	\$ 10,000.00
725-21.11	Network Switch (Type A)	EA		1	1	\$ 3,000.00	\$ 3,000.00
725-21.49	Modify Electrical Demarcation Point	EA		1	1	\$ 1,500.00	\$ 1,500.00
725-22.24	Conduit Bank (Type 4)	LF		50	50	\$ 7.00	\$ 350.00
725-22.34	Conduit Bank Bored (Type 4)	LF		150	150	\$ 25.00	\$ 3,750.00
725-22.50	DMS Conduit Bank	LF		150	150	\$ 15.00	\$ 2,250.00
725-22.74	2in Conduit w/ Bank	LF		150	150	\$ 2.50	\$ 375.00
725-23.10	Fiber Optic Cable (72 F)	LF		200	200	\$ 10.00	\$ 2,000.00
725-23.21	Fiber Optic Drop Cable (12ft)	LF		100	100	\$ 3.00	\$ 300.00
725-23.25	Fiber Optic Closure (72 F)	EA		1	1	\$ 750.00	\$ 750.00
725-23.28	Fiber Optic Splice Fusion	EA		148	148	\$ 50.00	\$ 7,400.00
725-24.51	System Integration	LS		1	1	\$ 3,000.00	\$ 3,000.00
730-01.02	Removal of Signal Equipment	EA		2	2	\$ 1,957.79	\$ 3,915.58
730-02.09	Signal Head Assembly (130 With Backplate)	EA		10	10	\$ 807.65	\$ 8,076.53
730-02.17	Signal Head Assembly (150 A2H With Backplate)	EA		2	2	\$ 1,313.83	\$ 2,627.67
730-03.20	Install Pull Box (Type A)	EA		4	4	\$ 385.67	\$ 1,542.67
730-03.21	Install Pull Box (Type B)	EA		4	4	\$ 481.62	\$ 1,926.47
730-05.01	Electrical Service Connection	EA		2	2	\$ 2,023.65	\$ 4,047.30
730-08.03	Signal Cable - 7 Conductor	LF		800	800	\$ 1.65	\$ 1,323.59
730-08.30	Interconnect Cable (Copper-Twisted Pair)	LF		1000	1000	\$ 2.67	\$ 2,670.00
730-12.14	Conduit 3" Diameter (Jack and Bore)	LF		400	400	\$ 25.74	\$ 10,296.16
730-12.16	Conduit (2" Conduit Schedule 80)	LF		200	200	\$ 13.80	\$ 2,760.38
730-13.01	VEHICLE LOOP DETECTOR (SHELF MOUNT)	EA		4	4	\$ 178.62	\$ 714.49
730-14.01	Shielded Detector Cable	LF		350	350	\$ 1.27	\$ 444.66
730-14.02	Saw Slot	LF		2000	2000	\$ 2.89	\$ 5,779.41
730-15.32	Cabinet (Eight Phase Base Mounted)	EA		2	2	\$ 13,544.50	\$ 27,089.00
730-16.02	Eight Phase Actuated Controller	EA		2	2	\$ 4,736.56	\$ 9,473.13
730-23.88	Cantilever Signal Support (1 ARM @ 45')	EA		3	3	\$ 14,116.19	\$ 42,348.57
730-23.96	Cantilever Signal Support (1 ARM @ 50')	EA		3	3	\$ 19,551.62	\$ 58,654.85
LIGHTING & SIGNALIZATION TOTAL (ROUNDED)							\$ 430,900
Guardrail							
705-01.01	Guardrail at Bridge Ends	LF	100		100	\$ 73.64	\$ 7,364.49
705-04.07	Tan Energy Absg Term (NCHRP, 350, TL3)	EA		4	4	\$ 2,352.59	\$ 9,410.38
705-04.09	Earth Pad for Type 38 GR End Treatment	EA		4	4	\$ 1,294.80	\$ 5,179.21
GUARDRAIL TOTAL (ROUNDED)							\$ 22,000
Seeding and Sodding							
SODDING TOTAL (ROUNDED)							\$ -
Maintenance of Traffic							
N/A	Traffic Control	LS	1		1	\$ 85,335.18	\$ 85,335.18
MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)							\$ 85,400

PAY ITEM SUMMARY

(BELVOIR AVE - TRADITIONAL CONSTRUCTION)

Signs							
Not Listed	Signs (Construction)	LS	1		1	\$ -	\$ 3,200
SIGNING TOTAL (ROUNDED)							\$ 3,200
Pavement Markings							
716-09.31	STOP LINE	LF		200	200	\$ 16.65	\$ 3,330.00
716-13.06	Spray Thermo P.M. (40 mil 4")	LM	0.0	2	2.0	\$ 2,878.11	\$ 5,756.23
PAVEMENT MARKINGS TOTAL (ROUNDED)							\$ 9,100
Fencing							
707-07.01	Chain-Link Fence (Bridges)	SF		1728	1728	\$ 42.00	\$ 72,576.00
FENCE TOTAL (ROUNDED)							\$ 72,600.00
Rip-Rap							
RIP-RAP & SLOPE PROTECTION TOTAL (ROUNDED)							\$ -
Clearing and Grubbing							
CLEAR AND GRUBBING TOTAL (ROUNDED)							\$ -
Railroad At-Grade Crossing							
RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)							\$ -
Utilities							
N/A	Overhead Distribution	LM	0.1		0.1	\$ 375,000	\$ 37,500
N/A	Overhead Transmission	LM	0.1		0.1	\$ 750,000	\$ 75,000
N/A	Underground Communication	LM	0.1		0.1	\$ 500,000	\$ 50,000
N/A	Underground Gas	LM	0.1		0.1	\$ 250,000	\$ 25,000
N/A	Underground Water	LM	0.1		0.1	\$ 237,600	\$ 23,760
UTILITIES TOTAL (ROUNDED)							\$ 211,300.00
Right-of-Way							
N/A	Right-of-Way	LS	1		1	\$ -	\$ -
RIGHT-OF-WAY TOTAL (ROUNDED)							\$ -

ATTACHMENT 2-C

Projected Traffic

PIN 124069.00

Bridge ID: 33I00240057

**TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION**

PROJECT NO.: BR-I-24-3(97) : 33003-0166-44 ROUTE: I-24 & BELVOIR AVE. BRIDGES
 COUNTY: HAMILTON CITY: CHATTANOOGA
 PROJECT PIN NUMBER: 124069.00
 PROJECT DESCRIPTION: [1] I-24 BRIDGE OVER GERMANTOWN RD @ L.M. 12.08 TRAFFIC DATA.

[2] BELVOIR AVE. BRIDGE OVER I-24 @ L.M. 1.01 TRAFFIC DATA.

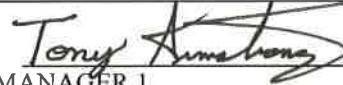
DIVISION REQUESTING:

MAINTENANCE PAVEMENT DESIGN
 S.T.I.D. STRUCTURES
 PROG. DEVELOPMENT & ADM. SURVEY & ROADWAY DESIGN
 PUBLIC TRANS. & AERO. TRAFFIC SIGNAL DESIGN
 OTHER CONSULTANT
 YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: _____
 PROJECTED LETTING DATE: _____

TRAFFIC ASSIGNMENT:

	BASE YEAR		DESIGN YEAR				DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS		
	AADT	YEAR	AADT	DHV	%	YEAR	DIR.DIST.	DHV	AADT	FLEX	RIGID
[1]	114,670	2022	142,650	12,830	9	2042	65-35	15	23	8,840	13,414
[2]	9,300	2022	10,230	1,125	11	2042	70-30	2	3	88	112

REQUESTED BY: NAME LAUREN GAINES DATE 2/14/18
 DIVISION BARGE DESIGN SOLUTIONS
 ADDRESS 615 3rd AVE. S. SUITE 700
NASHVILLE TN 37210

REVIEWED BY: TONY ARMSTRONG  DATE 2-15-18
 TRANSPORTATION MANAGER I
 SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: JIM WATERS  DATE 2-15-18
 ASSISTANT DIRECTOR
 SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

THIS TRAFFIC WAS TAKEN FROM TWO PREVIOUS PROJECTS PREPARED FOR S.T.I.D. DATED 11/28/2017 AND 1/3/2018 WITH THE ADDITION OF ADL'S FOR PAVEMENT DESIGN.

DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 AADT.

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR AADTs OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.
 SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS.

**TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENT DIVISION**

PROJECT NO.: BR-I-24-3(97) : 33003-0166-44
 COUNTY: HAMILTON
 PROJECT DESCRIPTION: BRIDGE OVER I-24 @ L.M. 1.01.

ROUTE NO.: BELVOIR AVE. [3611] [2]
 CITY: CHATTANOOGA

FAP Urban

Pavement Structural Design

Calculation of Equivalent Daily 18 Kip Single Axle Loads

Type Vehicle	ADT (No. Counted)	Flexible		Rigid	
		18-kip Factor	ADL	18-kip Factor	ADL
Pass. cars and motorcycles (1-2)	5,566	0.001	6	0.001	6
Pick-up, Panel, Van (3)	3,906	0.004	16	0.004	16
Sing. Unit Buses (4)	27	0.300	8	0.300	8
2-axle, 6-tire (5)	139	0.260	36	0.260	36
3-axle or more (6-7)	55	1.000	55	1.500	83
4-axle (8)	56	0.640	36	0.800	45
Comb. 5-axle or more (9-13)	16	1.200	19	1.900	30
Totals (2032 AADT)	9,765		175		223

Suggested Percentages of Trucks in Design Lane

5,000 or less ADT	95%
5,000 - 10,000 ADT	90%
10,000 - 15,000 ADT	85%
15,000 - 20,000 ADT	80%
20,000 - 30,000 ADT	75%
30,000 - 40,000 ADT	70%
40,000 Plus	60%

No. of Lanes: 2

% Trucks in Design Lane: 100%

ADL in Design Lane:

FLEX:	0.5	X	1.00	X	175.5	=	88
RIGID:	0.5	X	1.00	X	223.1	=	112

ADL Calculations By: RANDY BOGUSKIE
 Reviewed By: *Tony Amstutz*
 [REV. 7/1/14]

Date: 2/14/2018
 Date: 2.15.18

ATTACHMENT 2-D

Bridge TIR Tables

PIN 124069.00

Bridge ID: 33I00240057

BRIDGE TIR

Belvoir Avenue over
Interstate 24

LOCATION			
Bridge #:	33I00240057	Feature Crossed:	Interstate 24 (I0024)
Road Name:	Belvoir Avenue	Log mile:	1.01
Route ID:	O3611	System:	NOT A NHS ROUTE
City:	Chattanooga	Functional Class:	Urban Minor Arterial
County:	Hamilton	State Project Number	BR-I-24-3(97)
PIN:	124069.00		

ROADWAY		
	Existing	Proposed (Preliminary Design Estimate)
Design Standard		RD01-TS-6
Route Characteristics		
AADT:	9,300	10,230
AADT Year:	2022	2042
Terrain:	Rolling	Rolling
No. Lanes:	4	4
Speed(Posted):	30	30
Speed (Design):		30
Approach Character.		
Lane Width (ft):	12	12
Shoulder Width (ft):	10	0
ROW Width (ft):	79.5	79.5
ROW Tracts Affected		n/a
ROW Required (acre)		n/a
Cross Section Width (ft):	79.5	70
Approach Length (ft):		n/a
Alignment:	Tangent + Intersection Each End	Same as Existing
Grade:		???
Surface Material:	Asphalt	Asphalt
Sidewalks (R/L):	4'/4'	4'/4'
App. Lower Than Structure	No	No
Utilities (list)	OH: distribution, transmission; UG: water, gas, communication;	OH: distribution, transmission; UG: water, gas, communication;
Utilities to be Relocated		OH: distribution, transmission; UG: water, gas, communication;
Comments		Construction Manager/General Contractor (CM/GC) Project

BRIDGE TIR

Belvoir Avenue over
Interstate 24

STRUCTURE		
	Existing	Proposed (Preliminary Design Estimate)
Bridge Characteristics		
Year Built	1965	
Load Limit	20 tons	
Sufficiency Rating	86.6	
Skew	90°	90°
Structure Type	Prestressed Concrete	Steel (WPG)
Structures in Channel	n/a	n/a
Length (ft)	190.5	152
No. Spans (App./Main)	0 4	0 2
Width (curb to curb) (ft)	67.833	48
Width (o to o) (ft)	79.33	62
Sidewalks on Structure	Yes	Yes
Vert. Clearance (ft)	16.33	16.2
Superstructure Depth (in)	Spans 1-3 = 29 / Span 4 = 19	31
Girder Depth (in)	27/17	21
Finish Grade-Low Girder (in)	29/19	31
High Water Marks	n/a	
Bridge Rail Type	Post-Beam	STD-11-1
Bridge Rail Height (ft)	2.67	3.8
Indication Overtopping	n/a	
Local Scour	No	
Obstructions	No	
Other Structures		Fencing to be added to outside of fence railing at the request of TDOT Region 2
Comments		Construction Manager/General Contractor (CM/GC) Project

FLOW RATES (from USGS StreamStats Program Version 3)

Drainage Area (sq. miles)	0.14
10 Year Discharge Rate (Q10) cfs	68.3
50 Year Discharge Rate (Q50) cfs	108
100 Year Discharge Rate (Q100) cfs	128

CHANNEL

Depth (ft)	n/a
Width of Normal Flow (ft)	n/a
Depth of Normal Flow (ft)	n/a
Skew of Channel with Roadway	n/a
Type of Material in Stream Bed	n/a
Type of Vegetation on Banks	n/a
Are Channel Banks Stable	n/a
Signs of Stream Aggradation	n/a
Signs of Stream Degradation	n/a
Drift or Drift Potential	n/a
Comments	

FLOODPLAIN

Skew Same as Channel	n/a
Symmetrical About Channel	n/a
Approx. Floor Elevations	n/a
Type of Vegetation in Floodplain	n/a
Any Buildings in Floodplain	n/a
Flood Information From Locals	n/a
Comments	According to the FEMA Map, there is not a floodplain in the area of the site.

MAINTENANCE OF TRAFFIC

Method of Maintaining Traffic	temporary detour
Description	The current plan is to close the Belvoir Avenue bridge over Interstate 24 and detour the traffic along South Terrace and North Terrace. A detour map is shown in the functional plans in the preface of this study. This plan is subject to change once a CM (construction manager) is on board.
Comments	Construction Manager/General Contractor (CM/GC)

SITE VISIT ATTENDEES			DATE: 4/5/2018
Name	Organization	Phone	Email
Mike Gilbert	TDOT STID	615.741.0772	michael.gilbert@tn.gov
Jeremy Sims	TDOT Region 2	423.510.1227	jeremy.sims@tn.gov
Alan Wolfe	TDOT Region 2 Traffic	423.510.1139	alan.wolfe@tn.gov
Zach Johnson	TDOT Region 2 Traffic	423.510.6914	zach.johnson@tn.gov
Robert Rodgers	TDOT Region 2 Design	423.510.1138	robert.rodger@tn.gov
Michael Cloud	TDOT Region 2	615.532.1676	michael.cloud@tn.gov
Garris Bugg	TDOT Region 2		garris.bugg@tn.gov
Wade Goss	TDOT Region 2		wade.goss@tn.gov
Ben Taylor	City of Chattanooga	423.643.5557	bgtaylor@chattanooga.gov
Wes Hughen	TDOT Region 2	423.510.1133	wesley.hughen@tn.gov
Adam Casteel	TDOT R2 Operations	423.208.6113	adam.casteel@tn.gov
Jamie Fitzpatrick	TDOT HQ Construction	615.741.0781	jamie.fitzpatrick@tn.gov
Robert LeFevre	TDOT Structures	615.741.0798	robert.lefevre@tn.gov
Nitaya Chayangkura	TDOT HQ Construction	615.532.8848	nitaya.chayangkura@tn.gov
Joe Deering	TDOT Region 2	423.892.3430	joe.deering@tn.gov
Gary Chapman	TDOT Region 2 Survey	423.510.1144	gary.chapman@tn.gov
Ken Flynn	TDOT R2 Operations	423.510.1217	ken.flynn@tn.gov
Scott Medlin	TDOT R2 Environmental	423.570.1118	scott.medlin@tn.gov
Doug Ford	TDOT Region 2 Survey	423.298.3279	douglas.ford@tn.gov
Jonathan Haycraft	Barge Design	615.252.4242	jonathan.haycraft@bargedesign.com
Kevin McAlister	Barge Design	615.252.4294	kevin.mcalister@bargedesign.com
Lauren Gaines	Barge Design	615.252.4243	lauren.gaines@bargedesign.com
Patrick Leap	Barge Design	615.252.4260	patrick.leap@bargedesign.com

ATTACHMENT 2-E

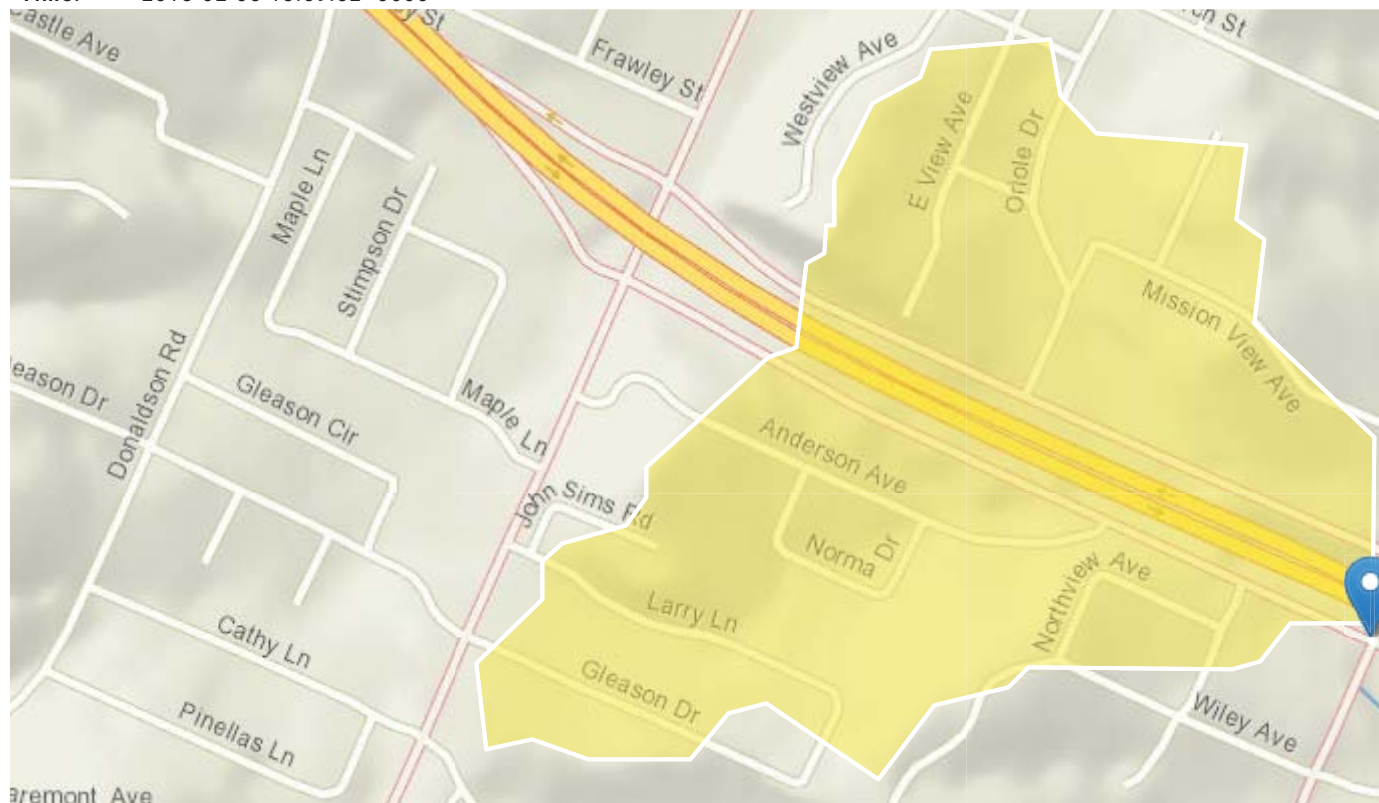
Stream Stats

PIN 124069.00

Bridge ID: 33I00240057

StreamStats Report

Region ID: TN
 Workspace ID: TN20180205195938744000
 Clicked Point (Latitude, Longitude): 35.01075, -85.24395
 Time: 2018-02-05 13:59:52 -0600



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CONTD	Area that contributes flow to a point on a stream	0.14	square miles
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	147.46	feet per mi
CLIMFAC2YR	Two-year climate factor from Lichy and Karlinger (1990)	2.351	dimensionless
DRNAREA	Area that drains to a point on a stream	0.14	square miles
RECESS	Number of days required for streamflow to recede one order of magnitude when hydrograph is plotted on logarithmic scale	80	days per log cycle
SOILPERM	Average Soil Permeability	1.97	inches per hour
PERMGTE2IN	Percent of area underlain by soils with permeability greater than or equal to 2 inches per hour	100.005	percent
TNCLFACT2	Tennessee climate factor, 2-year interval	2.351	
TNSOILFAC	Tennessee soil factor, percentage of area underlain by a soil permeability greater than or equal to 2 inches per hour	100	

Peak-Flow Statistics Parameters [MultiVariable Area 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CONTDA	Contributing Drainage Area	0.14	square miles	0.2	9000
CSL10_85	Stream Slope 10 and 85 Method	147.46	feet per mi	3.29	950
CLIMFAC2YR	Tennessee Climate Factor 2 Year	2.351	dimensionless	2.06	2.32

Peak-Flow Statistics Disclaimers [MultiVariable Area 1]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report [MultiVariable Area 1]

Statistic	Value	Unit
2 Year Peak Flood	31.5	ft ³ /s
5 Year Peak Flood	52.4	ft ³ /s
10 Year Peak Flood	68.3	ft ³ /s
25 Year Peak Flood	90.5	ft ³ /s
50 Year Peak Flood	108	ft ³ /s
100 Year Peak Flood	128	ft ³ /s
500 Year Peak Flood	178	ft ³ /s

Peak-Flow Statistics Citations

Law, G.S., and Tasker G.D., 2003, Flood-Frequency Prediction Methods for Unregulated Streams of Tennessee, 2000: U.S. Geological Survey Water-Resources Investigations Report 03-4176, 79p. (<http://pubs.usgs.gov/wri/wri034176/>)

Low-Flow Statistics Parameters [Low Flow Central and East Regions 2009 5159]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.14	square miles	1.3	14441
RECESS	Recession Index	80	days per log cycle	32	175
CLIMFAC2YR	Tennessee Climate Factor 2 Year	2.351	dimensionless	2.056	2.46
SOILPERM	Average Soil Permeability	1.97	inches per hour	0.45	9.72
PERMGTE2IN	Percent permeability gte 2 in per hr	100.005	percent	2	100

Low-Flow Statistics Disclaimers [Low Flow Central and East Regions 2009 5159]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report [Low Flow Central and East Regions 2009 5159]

Statistic	Value	Unit
7 Day 10 Year Low Flow	0.0116	ft ³ /s
30 Day 5 Year Low Flow	0.0173	ft ³ /s

Low-Flow Statistics Citations

Law, G.S., Tasker, G.D., and Ladd, D.E., 2009, Streamflow-characteristic estimation methods for unregulated streams of Tennessee: U.S. Geological Survey Scientific Investigations Report 2009–5159, 212 p., 1 pl. (<http://pubs.usgs.gov/sir/2009/5159/>)

Annual Flow Statistics Parameters [Low Flow Central and East Regions 2009 5159]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.14	square miles	1.3	14441
CLIMFAC2YR	Tennessee Climate Factor 2 Year	2.351	dimensionless	2.056	2.46
SOILPERM	Average Soil Permeability	1.97	inches per hour	0.45	9.72

Annual Flow Statistics Disclaimers [Low Flow Central and East Regions 2009 5159]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Annual Flow Statistics Flow Report [Low Flow Central and East Regions 2009 5159]

Statistic	Value	Unit
Mean Annual Flow	0.225	ft ³ /s

Annual Flow Statistics Citations

Law, G.S., Tasker, G.D., and Ladd, D.E., 2009, Streamflow-characteristic estimation methods for unregulated streams of Tennessee: U.S. Geological Survey Scientific Investigations Report 2009–5159, 212 p., 1 pl. (<http://pubs.usgs.gov/sir/2009/5159/>)

Seasonal Flow Statistics Parameters [Low Flow Central and East Regions 2009 5159]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.14	square miles	1.3	14441
RECESS	Recession Index	80	days per log cycle	32	175
CLIMFAC2YR	Tennessee Climate Factor 2 Year	2.351	dimensionless	2.056	2.46

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
SOILPERM	Average Soil Permeability	1.97	inches per hour	0.45	9.72

Seasonal Flow Statistics Disclaimers [Low Flow Central and East Regions 2009 5159]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Seasonal Flow Statistics Flow Report [Low Flow Central and East Regions 2009 5159]

Statistic	Value	Unit
Summer Mean Flow	0.0765	ft ³ /s

Seasonal Flow Statistics Citations

Law, G.S., Tasker, G.D., and Ladd, D.E., 2009, Streamflow-characteristic estimation methods for unregulated streams of Tennessee: U.S. Geological Survey Scientific Investigations Report 2009-5159, 212 p., 1 pl. (<http://pubs.usgs.gov/sir/2009/5159/>)

Flow-Duration Statistics Parameters [Low Flow Central and East Regions 2009 5159]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.14	square miles	1.3	14441
RECESS	Recession Index	80	days per log cycle	32	175
CLIMFAC2YR	Tennessee Climate Factor 2 Year	2.351	dimensionless	2.056	2.46
SOILPERM	Average Soil Permeability	1.97	inches per hour	0.45	9.72
PERMGTE2IN	Percent permeability gte 2 in per hr	100.005	percent	2	100

Flow-Duration Statistics Disclaimers [Low Flow Central and East Regions 2009 5159]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Flow-Duration Statistics Flow Report [Low Flow Central and East Regions 2009 5159]

Statistic	Value	Unit
99.5 Percent Duration	0.0113	ft ³ /s
99 Percent Duration	0.0125	ft ³ /s
98 Percent Duration	0.0146	ft ³ /s
95 Percent Duration	0.0175	ft ³ /s
90 Percent Duration	0.0215	ft ³ /s
80 Percent Duration	0.0274	ft ³ /s
70 Percent Duration	0.0373	ft ³ /s

Statistic	Value	Unit
60 Percent Duration	0.0521	ft ³ /s
50 Percent Duration	0.0764	ft ³ /s
40 Percent Duration	0.117	ft ³ /s
30 Percent Duration	0.176	ft ³ /s
20 Percent Duration	0.274	ft ³ /s
10 Percent Duration	0.455	ft ³ /s

Flow-Duration Statistics Citations

Law, G.S., Tasker, G.D., and Ladd, D.E., 2009, Streamflow-characteristic estimation methods for unregulated streams of Tennessee: U.S. Geological Survey Scientific Investigations Report 2009-5159, 212 p., 1 pl. (<http://pubs.usgs.gov/sir/2009/5159/>)

ATTACHMENT 2-F

FEMA Map

PIN 124069.00

Bridge ID: 33I00240057

ATTACHMENT 2-G

Site Photos

PIN 124069.00

Bridge ID: 33100240057



No. 1 Right Side



Top of Deck - Northbound



Bottom of Deck / Clearance - Eastbound



Top of Deck - Southbound



Bottom of Deck / Clearance – Westbound



Bottom of Deck / Clearance – Westbound (Right Side)



Bottom of Deck / Clearance – Westbound (Left Side)



Abutment No. 2



Span No. 3 / Bent No. 2



Bent No. 1



Bent No. 1



Approach No. 1



Bridge Surface



Bridge Rail



Approach No. 2



Approach No. 2



Bent No. 3



Bent No. 2

Kimberly Vasut-Shelby

From: Rachel Gentry
Sent: Thursday, August 30, 2018 1:08 PM
To: Kimberly Vasut-Shelby
Cc: jonathan.haycraft@bargedesign.com; Joe Deering; Wesley Hughen; Jeff Blevins; Lori Lange; Lia Obaid; Tammy Sellers
Subject: 124069.00 Hamilton Co. I-24 CMGC, NEPA Alternatives & Traffic Control Questions
Attachments: 124069.00 NEPA Alternatives & Traffic Control Questions.docx

Kimberly,

Your questions were discussed with Region 2 staff, HQ Construction staff, and the design consultant. I have copied both of your email questions in to a word document and placed the responses we discussed in **red**. Once you review these responses we would like to set up a time to have a phone conference to discuss anything further.

Thank you,

Rachel Gentry



Rachel R. Gentry, P.E. | Trans. Proj. Spec. Supervisor I
Region 2 Project Development – Team 3
7512 Volkswagen Drive, Chattanooga, TN 37416
office: (423) 510-1161 | cell: (615) 981-0063
rachel.gentry@tn.gov
www.tn.gov/tdot

From: Kimberly Vasut-Shelby

Sent: Thursday, August 23, 2018 1:39 PM

To: Wesley Hughen

Cc: Sharon Sanders; Erick Hunt-Hawkins; 'Klint Rommel (Klint.Rommel@tn.gov)'; Joe Deering; Lori Lange; Lia Obaid; Ted Kniazewycz

Subject: Traffic Control for 124069.00 in Hamilton County

Good Afternoon,

I wanted quickly send a follow up email concerning traffic control. Concerning the I-24 bridge over Germantown Road, it is my understanding, should one of the closure options be selected, the duration of that closure will be one weekend (for each of the 2 sides of bridge). **The thought is that it will not take more than a few weekends of full closure, but that will not be decided until further discussion with the CMGC.**

I also wanted to ask if there are potential I-24 closures for the Belvoir Bridge. In the review of the detour information for this bridge, it is not clear if I-24 will need to be partially closed while the bridge is being set. It was my understanding that this bridge will also be limited to weekend work and should only take one weekend. **Two lanes of traffic in each direction will be required to remain open throughout the project. Full closure may be necessary for short durations, which may include rolling road blocks, and/or night/weekend closures with temporary detours, while setting beams.**

The last confirmation question I wanted to ask is if there is a possibility that both of these bridges will be under construction at the same time. If this is the case, how will that impact traffic and traffic control? **Due to the need to coordinate traffic control it is anticipated that one project can be completed before the other; however it will ultimately be the decision of the CMGC how to phase the project and detour traffic.**

Thank you for your feedback. Once we receive clarification on the points above, I can incorporate the information into the environmental document. Should you need any clarification from me, please let me know.

Thank you,

Kim

From: Kimberly Vasut-Shelby

Sent: Tuesday, August 21, 2018 12:37 PM

To: Wesley Hughen

Cc: Sharon Sanders; Erick Hunt-Hawkins; Klint Rommel; Joe Deering; Lori Lange; Lia Obaid

Subject: Questions Concerning 124069.00 in Hamilton County, Build Alternatives and Traffic Control Alternatives

Wes,

I hope you are having a wonderful start to your week. I am emailing to request additional information on a project I am currently working on. The subject project is the Bridge Replacement Project in Hamilton County (124069.00), I-24 Bridge over Germantown Road and Belvoir Avenue Bridge over I-24. We have received all technical studies back from this project and I am currently working on our environmental document. I have a few follow up questions I am hoping you can assist me with.

The first question concerns the construction alternatives (see the table from the TIR below). For the I-24 Bridge over Germantown Road, I see a 4-span concrete option (baseline or ABC) and a 2-span steel bridge option (Lateral Slide or SPMT). Since the development of the TIR, has a construction/build alternative been selected? If it has not, is this build alternative decision to be made by TDOT or the designer during bid and/or construction? **No, at this time a decision has not been made. This will be determined by the CMGC team and all options should be included in the NEPA document.** Later in the TIR, it states that this bridge has been selected for ABC techniques. Does that mean that Alternative 1 is no longer an option? **All alternatives should be included as options in the NEPA document. The TIR lists ABC techniques as "preferred" but the CMGC team may come up with a way to use the traditional construction.**

The alternative we have for the Belvoir bridge includes a 2-span bridge but it does not establish if this bridge is a proposed concrete or steel bridge. Can you please specify? **At this time we do not know if it will be steel or concrete.**

The next question concerns the construction alternatives in relation to traffic control. The I-24 Bridge over Germantown Road has four options for traffic control (two for closing the bridge and two for shifting traffic). I wanted to confirm that my understanding of what the traffic control option(s) is/are for each alternative is correct. I have marked the table included within the TIR with my understanding of the traffic control options we have for each build alternative (see table below). I see that some of the alternatives within table have multiple options. Has a decision been made as to which option is being moved forward? **All traffic control options are on the table. It will be up to the CMGC team to determine what traffic control options to use.**

Construction Alternates		Bridge Alternates	Traffic Phasing Plans	
Concrete Bridge	Baseline	Alternate 1	Road Closure (Detour to Next Ramp) Road Closure (Temporary Ramp)	Closure 1 Closure 2
	Accelerated Bridge Construction	Alternate 2	Slide (Traffic Out then In)	Shift 1
Steel Bridge- Lateral Slide		Alternate 3	Road Closure (Detour to Next Ramp) Road Closure (Temporary Ramp) Slide (Traffic South then North)	Closure 1 Closure 2 Shift 2 (North then South)
Steel Bridge - SPMT		Alternate 4	Road Closure (Detour to Next Ramp) Road Closure (Temporary Ramp)	Closure 1 Closure 2

If the information is available, can you also provide an estimated duration of these traffic control options depending on build alternative? This can assist us with providing additional differences between all options. Any full closures would be weekend closures only on the interstate, not to include any special events. The contractor will be given a predetermined number of weekends in which the interstate can be closed once the method is determined. At this time there has not been discussion regarding the number of weekend closures. Have traffic studies been completed for either bridge that would determine the impact these options would have on traffic utilizing these roadways? No. In the past, weekend closures have been considered short term closures so this has meant the traffic studies have not been necessary. This is of particular importance regarding the traffic phasing plans (Closure 1 and Closure 2) that would include temporarily closing portions of I-24.

Additionally, in the TIR it states that there are no plans to use ABC techniques for the Belvoir bridge and it instead will use traditional construction. It states that local roads will be utilized as detour during construction. If this is the case, can you provide additional detail? North/South Terrace are being shown as the detour routes for Belvoir Ave. These are frontage roads on State ROW. The contractor will be expected to maintain two lanes of traffic on the interstate at all times. It is anticipated that the work needed on S. Germantown could be completed prior to working on Belvoir or Belvoir could be done prior to working on S. Germantown Rd. Most of the construction at S. Germantown Rd is with regards to the interstate and not S. Germantown Rd making this approach feasible. What will be the duration of the traditional construction? It's thought that with typical bridge construction it will take about 9 months; however that is subject to change once the final construction method is decided by the CMGC. What are the proposed detour routes and its mileage? Are there any figures that represent traffic control for this bridge? See page xiv in the TIR.

If you have any additional information regarding these build and construction alternatives, your clarification would be very much appreciated. If at any point you need information from me, please let me know.

Thank you and have a wonderful week.

Kim

Environmental Studies Request

Environmental Studies

Environmental Studies Request

Project Information

Route: I-24
Termini: Bridges at Germantown Road, LM 12.08 and Belvoir Avenue, 12.59 in East Ridge.
County: Hamilton
PIN: 124069.00

Request

Request Type: Initial Environmental Study
Project Plans: Area of Influence Map
Date of Plans: 03/15/2018
Location: Email Attachment

Certification

Requestor: Kimberly Vasut-Shelby
Title: Environmental Studies Specialist AD

Signature: Kimberly Vasut-Shelby
Digitally signed by Kimberly Vasut-Shelby
Date: 2018.03.16 08:02:13 -05'00'

TYPE	YEAR	COUNTY	SHEET NO.
BRIDGE	2018	HAMILTON	



PROJECT NUMBERS:
 PIN PROJECT #: 124069.00
 STATE PROJECT #: BR-I-24-3(97)

TRANSPORTATION INVESTMENT REPORT

INTERSTATE 24 (I0024) BRIDGE OVER SOUTH GERMANTOWN ROAD @ L.M. 12.08
 AND BELVOIR AVENUE BRIDGE OVER INTERSTATE 24 @ L.M. 1.01
 HAMILTON COUNTY



STATE OF TENNESSEE
 DEPARTMENT OF
 TRANSPORTATION

INTERSTATE 24
 AREA OF INFLUENCE

Ecology

Environmental Study

Technical Section

Section: Ecology

Study Results

See attached Environmental Boundaries Report (EBR) dated 17 April 2018. TDOT proposes to conduct a presence / absence survey for bats during the summer 2018 sampling season. USFWS section 7 consultation will be completed upon receipt and review of the summer bat survey results.

Commitments

Did the study of this project result in any environmental commitments?

No

Additional Information

Is there any additional information or material included with this study?

Yes

Type: Environmental Boundaries Report (EBR)


Location: Email Attachment

Certification

Responder: Brandon Chance

Title: Region 2 TESS ADV

Signature: Brandon
Chance

 Digitally signed by Brandon Chance
DN: cn=Brandon Chance, o=TDOT,
ou=Region 2 Project Development -
Environmental Tech Office - Ecology,
email=k.brandon.chance@tn.gov, c=US
Date: 2018.04.17 09:59:52 -05'00'



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION**

REGION 2 PROJECT DEVELOPMENT
P. O. BOX 22368
CHATTANOOGA, TENNESSEE 37422
(423) 510-1165

JOHN C. SCHROER
COMMISSIONER

BILL HASLAM
GOVERNOR

To: Robert Rogers
Region 2 Project Development
Environmental Tech Office

From: Brandon Chance
Region 2 Project Development
Environmental Tech Office - Ecology

DATE: 23 April 2018

**SUBJECT: Environmental Boundaries Report:
Hamilton County, I-24 Bridges at Germantown Road, LM 12.08 and Belvoir
Avenue, LM 12.59 in East Ridge.
PE: 33003-0166-44 PIN: 124069.00**

TDOT Region 2 Environmental Tech staff completed the environmental field survey for the subject project and submits the following results:

WETLANDS

There are no wetlands within the project area.

SPRINGS, STREAMS, WET WEATHER CONVEYANCES AND EPHEMERAL STREAMS

There are three (3) intermittent streams within the project area.

PROTECTED SPECIES

There is one (1) rare species within a one (1) mile radius of the project limits and 13 rare species within the four (4) mile radius of the project limits. Responses from Tennessee Wildlife Resources Agency (TWRA) and TDEC Division of Natural Areas are provided. There is suitable habitat for Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*)

within the project area. TDOT proposes to conduct a presence / absence survey for bats during the summer 2018 sampling season. USFWS section 7 consultation will be completed upon receipt and review of the summer bat survey results.

SPECIAL NOTES

To comply with Section 7 of the Endangered Species Act, TDOT has agreed to the following commitment for this project:

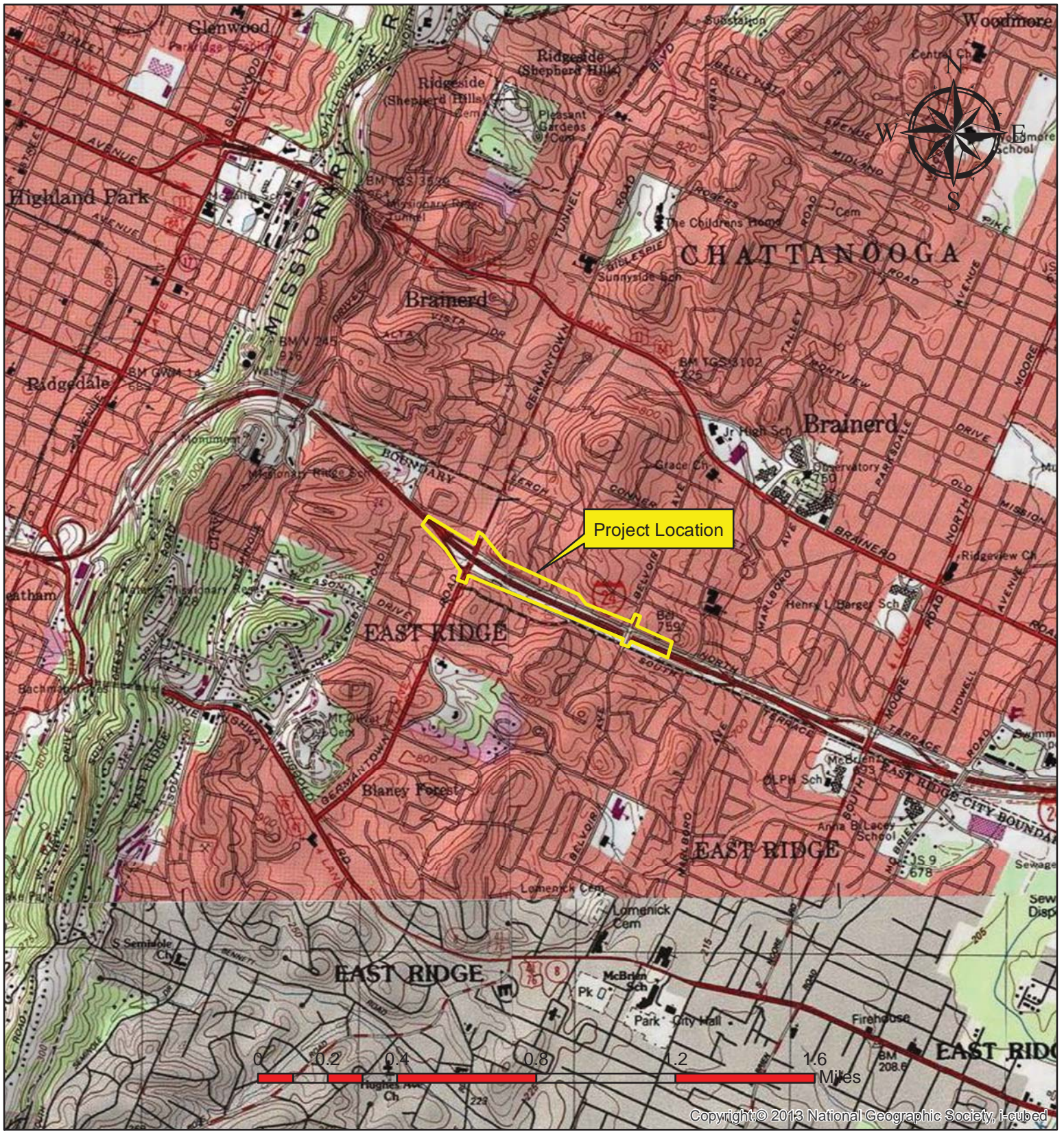
“Due to concerns for the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*), TDOT is committed to conducting a presence / absence survey for bats during the summer 2018 sampling season.”

Please incorporate this information into the project plans as needed. Thank you for your assistance with this project. If you have any questions or comments please contact me at K.Brandon.Chance@tn.gov or 931.520.2418.

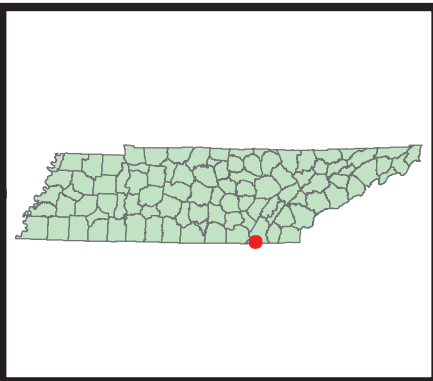
Attachment – Ecology Review :

Memorandum, Project Location Maps, Impact Table, Water Resources Maps, Field Forms, Species Form, and Species Coordination Correspondence

Copy: Region 2 Project Delivery: Wes Hughen, Jeremy Sims, Scott Medlin, Chester Sutherland, Rob Howard, Colby Mann,
Emily Carpenter
HQ Ecology: Matt Richards, Dennis Crumby
HQ Permits: Kristen Taylor, Mary Showers
NEPA Documentation Office: TDOT.Env.NEPA@tn.gov
FileNet



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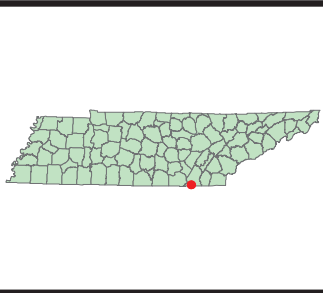


**Project Location Topographic Map
Hamilton County, I-24, Bridges at Germantown Rd & Belvoir Avenue**

**Chattanooga, TN Quadrangle (105-SE)
03.16.2018**

**P.E. 33003-0166-44
PIN 124069.00**





Project Location Aerial Map
Hamilton County, I-24, Bridges at Germantown Rd & Belvoir Avenue

Chattanooga, TN Quadrangle (105-SE)
03.16.2018

P.E. 33003-0166-44
PIN 124069.00

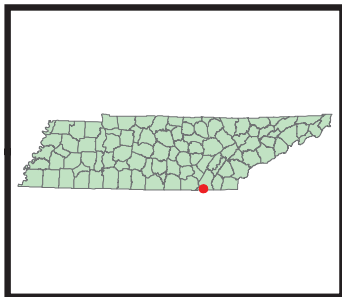
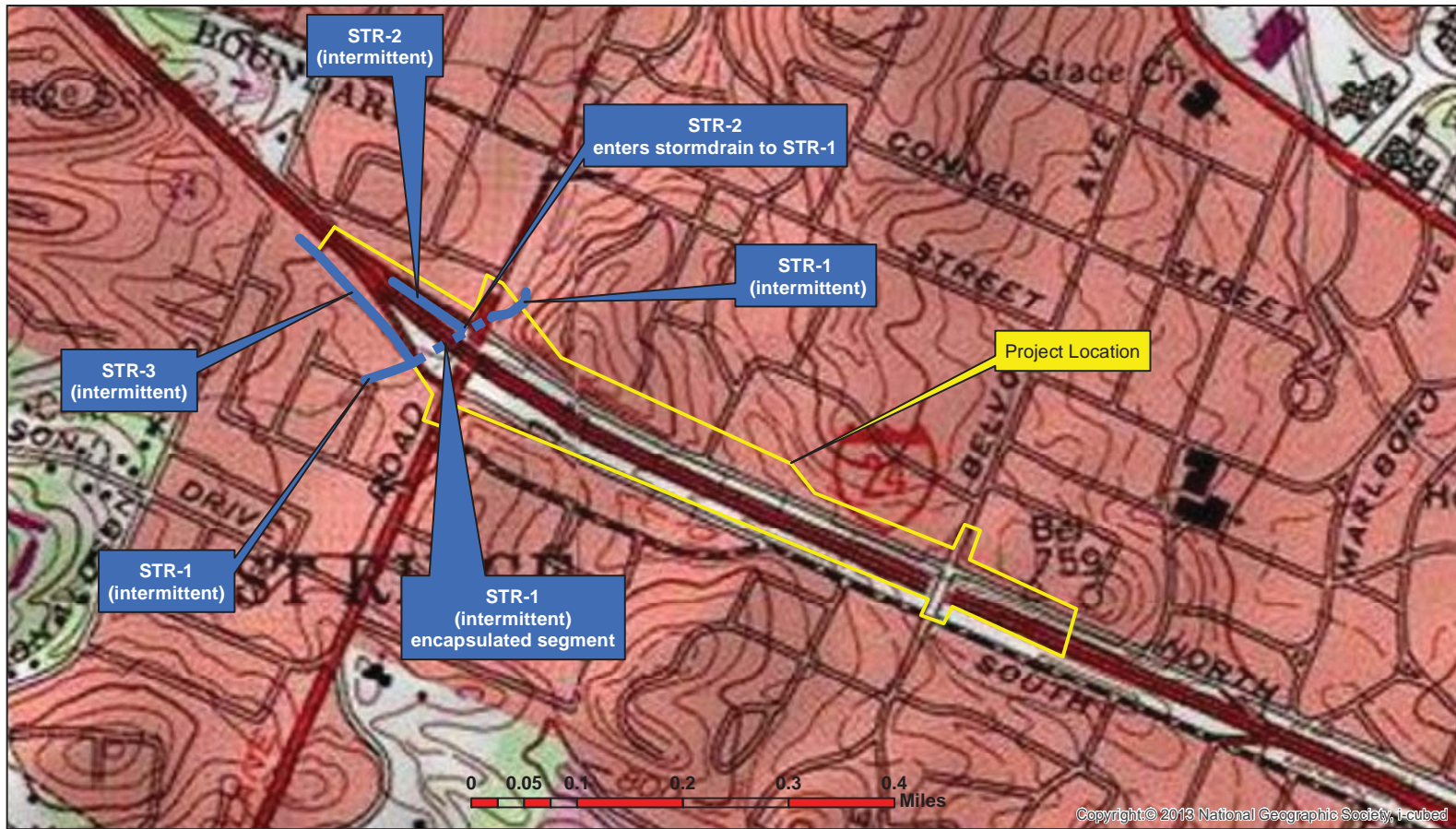


Impact Table: PIN 124069.00 - Hamilton County, I-24 bridges at Germantown Road and Belvoir Avenue

Site Number (Label)	Station Number from Plans	Latitude	Longitude	Estimated amount of aquatic resource in review area	Type	Receiving Water	Function	Quality
Wetlands								
N/A								
Streams								
STR-1	*	35.0148°	-85.2512°	645 ft**	Intermittent	Spring Creek		TDEC: ETW and 303(d) list for siltation, habitat, and e-coli
STR-2	*	35.0151°	-85.2527°	460 ft**	Intermittent	Spring Creek		TDEC: ETW and 303(d) list for siltation, habitat, and e-coli
STR-3	*	35.0143°	-85.2528°	868 ft**	Intermittent	Spring Creek		TDEC: ETW and 303(d) list for siltation, habitat, and e-coli

* Plans are functionals at this time and have not been assigned station numbers.

** Estimate lengths include all stream footage within the project area for the intersection, including previously impacted resources.

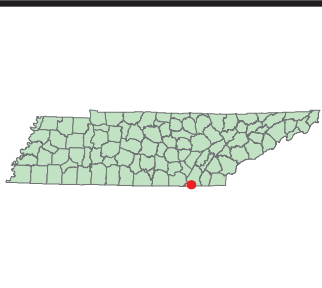


Water Resources Topographic Map
Hamilton County, I-24, Bridges at Germantown Rd & Belvoir Avenue

Chattanooga, TN Quadrangle (105-SE)
 03.16.2018

P.E. 33003-0166-44
 PIN 124069.00





Water Resources Aerial Map
Hamilton County, I-24, Bridges at Germantown Rd & Belvoir Avenue

Chattanooga, TN Quadrangle (105-SE)
 03.16.2018

P.E. 33003-0166-44
 PIN 124069.00



Ecology Field Data Sheet: Water Resources

Project: PIN 124069.00, I-24 Bridges at Germantown Road LM 12.08 and Belvoir Ave LM 12.59 in East Ridge	
Biologist: Brandon Chance and Rob Howard	Affiliation: TDOT R2 Env Tech
Date: 15 March 2018	
1-Station: from plans	No plans at this time.
2-Map label and name	STR-1
3-Latitude/Longitude	35.0148°N, -85.2512°W
4-Potential impact	crossing / runoff
5-Feature description:	
-channel identification	perennial stream <input type="checkbox"/> intermittent stream <input checked="" type="checkbox"/> ephemeral stream <input type="checkbox"/> wwc <input type="checkbox"/>
-HD score (if applicable)	N/A
-OHWM indicators	bed & banks <input checked="" type="checkbox"/> deposition <input checked="" type="checkbox"/> presence of litter / debris <input type="checkbox"/> scour <input checked="" type="checkbox"/> veg absent, bent, matted <input type="checkbox"/>
	change in plant community <input type="checkbox"/> destruction of terrestrial veg <input type="checkbox"/> multiple observed flow events <input type="checkbox"/> sediment sorting <input type="checkbox"/> water staining <input checked="" type="checkbox"/>
	change in soil character <input type="checkbox"/> leaf litter disturbed absent <input type="checkbox"/> natural line impressed on bank <input type="checkbox"/> shelving <input type="checkbox"/> wracking <input type="checkbox"/>
-sinuosity	absent <input type="checkbox"/> weak <input checked="" type="checkbox"/> moderate <input type="checkbox"/> strong <input type="checkbox"/>
-channel bottom width	10-12 ft
-top of bank width	10-12 ft
- avg. gradient of stream (%)	<5%
-bank height and slope ratio	LDB - 3-6 ft (0.5-1) RDB - 6-9 ft (0.25 - 1)
-water flow	fast <input type="checkbox"/> moderate <input type="checkbox"/> slow <input type="checkbox"/> isolated pools <input checked="" type="checkbox"/> none <input type="checkbox"/>
-water depth (riffles / pools)	none / 2-4 inches water width (riffles / pools) none / 10-12 ft
-bank stability: LDB, RDB	LDB: Stable <input checked="" type="checkbox"/> Eroding <input type="checkbox"/> Undercutting <input type="checkbox"/> Sloughing <input type="checkbox"/> Exposed Roots <input type="checkbox"/> RDB: Stable <input checked="" type="checkbox"/> Eroding <input type="checkbox"/> Undercutting <input type="checkbox"/> Sloughing <input type="checkbox"/> Exposed Roots <input type="checkbox"/>
-dominant riparian species: ------(LDB /RDB)-----	LDB: fescue RDB: privet, Japanese honeysuckle, red oak, white oak, yellow poplar
-habitat assessment score	58
epifaunal substrate	2
channel alteration	1
riffle embeddedness	1
frequency of re-ox zones	17
velocity / depth regime	4
bank stability	LDB 10 RDB 10
sediment deposition	3
bank vegetative protection	LDB 0 RDB 0
channel flow status	2
riparian veg zone width	LDB 1 RDB 7
-OHWM	estimated at 770 ft
-riffle pool complex	no
-fish, benthos,algae, aquatic life	none observed
6-photo numbers	see attached photo summary
7-rainfall information	0.39 inches in previous 7 days
8-HUC -12 Code & Name	060200010903 - Spring Creek
9-Confirmed by:	
10-Assessed	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
11-ETW	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
12-303 (d) List	yes <input checked="" type="checkbox"/> siltation <input checked="" type="checkbox"/> habitat: <input checked="" type="checkbox"/> other: <input checked="" type="checkbox"/>
	no <input type="checkbox"/>
13-Notes	Spring Creek is also 303(d) listed for e-coli. The stream is confined to a concrete and cement channel upstream of the culvert under I-24 and the ramps. There is a sewage pump station at the culvert inlet with a public notice sign warning of overflows to the stream. The stream exits the culvert in the NE quadrant of the I-24 / Germantown Road interchange into a gabion basket lined channel for ~250 ft downstream where it becomes a deeply incised, eroding channel. This stream is identified as STR-5 on the I-75 / I-24 interchange project.

Ecology Field Data Sheet: Water Resources

Project: PIN 124069.00, I-24 Bridges at Germantown Road LM 12.08 and Belvoir Ave LM 12.59 in East Ridge	
Biologist: Brandon Chance and Rob Howard	Affiliation: TDOT R2 Env Tech
Date: 15 March 2018	
1-Station: from plans	No plans at this time.
2-Map label and name	STR-2
3-Latitude/Longitude	35.0151°N, -85.2527°W
4-Potential impact	crossing / runoff
5-Feature description:	
-channel identification	perennial stream <input type="checkbox"/> intermittent stream <input checked="" type="checkbox"/> ephemeral stream <input type="checkbox"/> wwc <input type="checkbox"/>
-HD score (if applicable)	N/A
-OHWM indicators	bed & banks <input checked="" type="checkbox"/> deposition <input type="checkbox"/> presence of litter / debris <input type="checkbox"/> scour <input type="checkbox"/> veg absent, bent, matted <input type="checkbox"/>
	change in plant community <input type="checkbox"/> destruction of terrestrial veg <input type="checkbox"/> multiple observed flow events <input type="checkbox"/> sediment sorting <input type="checkbox"/> water staining <input checked="" type="checkbox"/>
	change in soil character <input type="checkbox"/> leaf litter disturbed absent <input type="checkbox"/> natural line impressed on bank <input checked="" type="checkbox"/> shelving <input type="checkbox"/> wracking <input type="checkbox"/>
-sinuosity	absent <input checked="" type="checkbox"/> weak <input type="checkbox"/> moderate <input type="checkbox"/> strong <input type="checkbox"/>
-channel bottom width	1-2 ft
-top of bank width	1.5-3 ft
- avg. gradient of stream (%)	<5%
-bank height and slope ratio	LDB - 1 ft (1:1) RDB - 1 ft (1:1)
-water flow	fast <input type="checkbox"/> moderate <input type="checkbox"/> slow <input checked="" type="checkbox"/> isolated pools <input type="checkbox"/> none <input type="checkbox"/>
-water depth (riffles / pools)	1-2 inches / 1-2 inches water width (riffles / pools) 1-2 ft / 1-3 ft
-bank stability: LDB, RDB	LDB: Stable <input type="checkbox"/> Eroding <input checked="" type="checkbox"/> Undercutting <input type="checkbox"/> Sloughing <input type="checkbox"/> Exposed Roots <input type="checkbox"/> RDB: Stable <input type="checkbox"/> Eroding <input checked="" type="checkbox"/> Undercutting <input type="checkbox"/> Sloughing <input type="checkbox"/> Exposed Roots <input type="checkbox"/>
-dominant riparian species: ------(LDB /RDB)-----	LDB: fescue RDB: eastern red cedar, bush honeysuckle, hackberry, black willow, red maple
-habitat assessment score	55
epifaunal substrate	6
channel alteration	3
riffle embeddedness	4
frequency of re-ox zones	17
velocity / depth regime	4
bank stability	LDB 3 RDB 3
sediment deposition	6
bank vegetative protection	LDB 1 RDB 1
channel flow status	7
riparian veg zone width	LDB 0 RDB 0
-OHWM	estimated at 795 ft
-riffle pool complex	no
-fish, benthos, algae, aquatic life	none observed
6-photo numbers	see attached photo summary
7-rainfall information	0.39 inches in previous 7 days
8-HUC -12 Code & Name	060200010903 - Spring Creek
9-Confirmed by:	
10-Assessed	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
11-ETW	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
12-303 (d) List	yes <input checked="" type="checkbox"/> siltation <input checked="" type="checkbox"/> habitat: <input checked="" type="checkbox"/> other: <input checked="" type="checkbox"/>
	no <input type="checkbox"/>
13-Notes	Spring Creek is also 303(d) listed for e-coli. The stream originates at an under drain outlet on the north side of I-24 west. The stream is confined to the road ditch between the I-24 west entrance ramp from Germantown Road and I-24 west travel lanes at the base of the road fill slope. It flows down the road ditch and sinks adjacent to a storm drain that connects to STR-1 under Germantown Rd.

Ecology Field Data Sheet: Water Resources

Project: PIN 124069.00, I-24 Bridges at Germantown Road LM 12.08 and Belvoir Ave LM 12.59 in East Ridge	
Biologist: Brandon Chance and Rob Howard	Affiliation: TDOT R2 Env Tech
Date: 15 March 2018	
1-Station: from plans	No plans at this time.
2-Map label and name	STR-3
3-Latitude/Longitude	35.0143°N, -85.2528°W
4-Potential impact	crossing / runoff
5-Feature description:	
-channel identification	perennial stream <input type="checkbox"/> intermittent stream <input checked="" type="checkbox"/> ephemeral stream <input type="checkbox"/> wwc <input type="checkbox"/>
-HD score (if applicable)	N/A
-OHWM indicators	bed & banks <input checked="" type="checkbox"/> deposition <input type="checkbox"/> presence of litter / debris <input type="checkbox"/> scour <input checked="" type="checkbox"/> veg absent, bent, matted <input type="checkbox"/>
	change in plant community <input checked="" type="checkbox"/> destruction of terrestrial veg <input checked="" type="checkbox"/> multiple observed flow events <input type="checkbox"/> sediment sorting <input type="checkbox"/> water staining <input type="checkbox"/>
	change in soil character <input type="checkbox"/> leaf litter disturbed absent <input type="checkbox"/> natural line impressed on bank <input checked="" type="checkbox"/> shelving <input type="checkbox"/> wracking <input type="checkbox"/>
-sinuosity	absent <input checked="" type="checkbox"/> weak <input type="checkbox"/> moderate <input type="checkbox"/> strong <input type="checkbox"/>
-channel bottom width	5-6 ft
-top of bank width	6-8 ft
- avg. gradient of stream (%)	<5%
-bank height and slope ratio	LDB - 1 ft (1:1) RDB - 1 ft (1:1)
-water flow	fast <input type="checkbox"/> moderate <input type="checkbox"/> slow <input checked="" type="checkbox"/> isolated pools <input type="checkbox"/> none <input type="checkbox"/>
-water depth (riffles / pools)	none / 3-8 inches water width (riffles / pools) none / 5-6 ft
-bank stability: LDB, RDB	LDB: Stable <input type="checkbox"/> Eroding <input checked="" type="checkbox"/> Undercutting <input type="checkbox"/> Sloughing <input type="checkbox"/> Exposed Roots <input type="checkbox"/>
	RDB: Stable <input type="checkbox"/> Eroding <input checked="" type="checkbox"/> Undercutting <input type="checkbox"/> Sloughing <input type="checkbox"/> Exposed Roots <input type="checkbox"/>
-dominant riparian species: ------(LDB /RDB)-----	LDB: eastern red cedar, bush honeysuckle, hackberry, black walnut, privet RDB: eastern red cedar, bush honeysuckle, hackberry, black walnut, privet
-habitat assessment score	56
	epifaunal substrate 5 channel alteration 1
	riffle embeddedness 2 frequency of re-ox zones 3
	velocity / depth regime 10 bank stability LDB 5 RDB 5
	sediment deposition 3 bank vegetative protection LDB 2 RDB 2
	channel flow status 16 riparian veg zone width LDB 1 RDB 1
-OHWM	estimated at 780 ft
-riffle pool complex	no
-fish, benthos,algae, aquatic life	none observed
6-photo numbers	see attached photo summary
7-rainfall information	0.39 inches in previous 7 days
8-HUC -12 Code & Name	060200010903 - Spring Creek
9-Confirmed by:	
10-Assessed	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
11-ETW	yes <input checked="" type="checkbox"/> no <input type="checkbox"/>
12-303 (d) List	yes <input checked="" type="checkbox"/> siltation <input checked="" type="checkbox"/> habitat: <input checked="" type="checkbox"/> other: <input checked="" type="checkbox"/>
	no <input type="checkbox"/>
13-Notes	Spring Creek is also 303(d) listed for e-coli. The stream is channelized on the south side of the I-24 east exit ramp to Germantown Road. The stream flows at the base of the ramp fill slope and enters STR-1 at the STR-1 culvert entrance under the I-24 Germantown Rd. interchange.

Photo Summary: Field Photographs

Project Description: Hamilton County, I-24, Bridges at Germantown Rd LM 12.08 & Belvoir Avenue LM 12.59 in East Ridge

P.E.: 33003-0166-44 PIN: 124069.00



Date & Time: Thu Mar 15 11:09:21 EDT 2018
Position: 035.014794° N / 085.251315° W
Altitude: 771ft
Datum: WGS-84
Azimuth/Bearing: 281° N79W 4996mits (True)
Elevation Grade: +010%
Horizon Grade: +005%
Zoom: 1X

Photograph 1 – IMG_2707 - View of STR-1 looking upstream at culvert outlet, this culvert conveys the stream under the I-24 / Germantown Road intersection



Date & Time: Thu Mar 15 11:00:30 EDT 2018
Position: 035.014785° N / 085.251274° W
Altitude: 765ft
Datum: WGS-84
Azimuth/Bearing: 059° N59E 1049mits (True)
Elevation Grade: -008%
Horizon Grade: +006%
Zoom: 1X

Photograph 2 – IMG_2708 - View of STR-1 looking downstream from near the culvert outlet

Photo Summary: Field Photographs

Project Description: Hamilton County, I-24, Bridges at Germantown Rd LM 12.08 & Belvoir Avenue LM 12.59 in East Ridge

P.E.: 33003-0166-44 PIN: 124069.00



Photograph 3 – IMG_2710 - View of STR-1 looking downstream from the end of the gabion channelization



Photograph 4 – IMG_2717 - View of STR-1 looking upstream from near the culvert inlet at the edge of the existing ROW

Photo Summary: Field Photographs

Project Description: Hamilton County, I-24, Bridges at Germantown Rd LM 12.08 & Belvoir Avenue LM 12.59 in East Ridge

P.E.: 33003-0166-44 PIN: 124069.00



Photograph 5 – IMG_2718 - View of STR-1 looking downstream at the culvert inlet from near the edge of the existing ROW



Photograph 6 –IMG_2716 - View of STR-3 looking upstream from the confluence with STR-1 near the STR-1 culvert inlet under I-24 and Germantown Road

Photo Summary: Field Photographs

Project Description: Hamilton County, I-24, Bridges at Germantown Rd LM 12.08 & Belvoir Avenue LM 12.59 in East Ridge

P.E.: 33003-0166-44 PIN: 124069.00



Photograph 7 – IMG_2715 - View of STR-3 looking upstream from the upstream end of the concrete channel shown in Photo 6



Photograph 8 – IMG_2728 - View of STR-2 looking upstream at the origin between I-24 west and the I-24 west entrance ramp

Photo Summary: Field Photographs

Project Description: Hamilton County, I-24, Bridges at Germantown Rd LM 12.08 & Belvoir Avenue LM 12.59 in East Ridge

P.E.: 33003-0166-44 PIN: 124069.00



Photograph 9 – IMG_2715 - View of STR-3 looking downstream from the origin between I-24 west and the I-24 west entrance ramp

Species Review Form

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Date of field study: 03.15.2018

Date TDEC database checked: 03.20.2018

Completed by: R.L. Howard

Species reported within 1 mile radius of project

Species Scientific Name	Species Common Name	Status		Species is potentially present in R-O-W because: (A) it is listed by TDEC within ROW (B) habitat is present observed during site visit (C) critical habitat present within ROW	Species is considered likely NOT present in R-O-W because: (A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	Accommodations to minimize impacts: (A) BMPs are sufficient to protect species (B) Special Notes are included on project plans (C) Individuals will be impacted. (D) Accommodations not practical due to broad habitat description or mobility of species	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
		Fed	TN					
<i>Lonicera flava</i>	Yellow Honeysuckle	--	T		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	Yellow Honeysuckle is a deciduous, woody, twining vine which typically grows 10-20'. Inhabiting rocky soils in woods, slopes, bluffs, ledges and stream margins. Elliptic green leaves (to 3.5" long) are grayish green below and are paired along the stems, with the uppermost leaves on each stem joined at the bases (perfoliate). Two-lipped, tubular, mildly-fragrant, orange-yellow flowers (to 1.25" long) appear in whorls at the stem ends in mid-spring. Flowers give way to round, fleshy, orange to red berries (1/4" diameter) which appear in late summer. Last Observation 04.1954.	The Tennessee Division of Natural Areas database reports a historic record for the species 0.4 mile from the project limits.

Species Review Form

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Species reported within 1-mile to 4-mile radius of project

Species Scientific Name	Species Common Name	Status		Species is potentially present in R-O-W because: (A) it is listed by TDEC within ROW (B) habitat is present observed during site visit (D) critical habitat present within ROW	Species is considered likely NOT present in R-O-W because: (A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	Accommodations to minimize impacts: (A) BMPs are sufficient to protect species (B) Special Notes are included on project plans (C) Individuals will be impacted. (D) Accommodations not practical due to broad habitat description or mobility of species	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
		Fed	TN					
<i>Aneides aeneus</i>	Green Salamander	--	Rare, Not State Listed		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	Green Salamanders are associated with shaded rock outcroppings with abundant cracks and crevices and the trunks of trees in the vicinity of rock outcrops, typically at elevations of 500-1,300 m. Rock outcrops are usually sandstone or granite (Niemiller and Reynolds 2011). Last Observation Record 10.19.1985.	The Tennessee Division of Natural Areas database reports a record for the species 3.5 miles from the project limits.

Species Review Form

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Species Scientific Name	Species Common Name	Status		Species is potentially present in R-O-W because:	Species is considered likely NOT present in R-O-W because:	Accommodations to minimize impacts:	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
<i>Ardea herodias</i>	Great Blue Heron	--	Rare, Not State Listed	(A) it is listed by TDEC within ROW (B) habitat is present observed during site visit (C) critical habitat present within ROW	(A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	Hérons usually feed in calm, slow waters including lakes, rivers, ponds, marshes and swamps. They are occasionally seen foraging in fields and wet meadows. Nesting usually occurs in trees, although in other parts of their range they may be found nesting in low shrubs, man-made structures, and artificial nest structures and even on the ground (Butler 1992, Scharf 1991). The ideal nesting habitat occurs in wooded swamps or on islands dominated by mature hardwoods; isolated locations that discourage predation by snakes and mammals (Butler 1992). Last Observation Record 04.12.1993.	The Tennessee Division of Natural Areas database reports a record for the species 3.9 miles from the project limits.

Species Review Form

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Species Scientific Name	Species Common Name	Status		Species is potentially present in R-O-W because:	Species is considered likely NOT present in R-O-W because:	Accommodations to minimize impacts:	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
				(A) it is listed by TDEC within ROW (B) habitat is present observed during site visit (C) critical habitat present within ROW	(A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	(A) BMPs are sufficient to protect species (B) Special Notes are included on project plans (C) Individuals will be impacted. (D) Accommodations not practical due to broad habitat description or mobility of species		
<i>Aureolaria patula</i>	Spreading False-foxglove	--	S		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	Spreading False foxglove, <i>Aureolaria patula</i> , is restricted to river bluffs and related habitats in calcareous regions (Horn and Cathcart 2005). Last Observation Record 10.06.1988.	The Tennessee Division of Natural Areas database reports a record for the species 3.4 miles from the project limits.
<i>Cambarus extraneus</i>	Chickamauga Crayfish	--	T		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	Cambarus extraneus (Chickamauga Crayfish) is found in large streams and small rubble streams (Rhoades 1944). This species can be found in association with Cambarus bartoni (Rhoades 1944). Found in moderately flowing, small, shallow, rock-littered streams. Also found among trapped leaf litter. Last Observation Record 05.24.2008.	The Tennessee Division of Natural Areas database reports records for the species 2.5 and 3.3 miles from the project limits.

Species Review Form

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Species Scientific Name	Species Common Name	Status		Species is potentially present in R-O-W because: (A) it is listed by TDEC within ROW (B) habitat is present observed during site visit (D) critical habitat present within ROW	Species is considered likely NOT present in R-O-W because: (A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	Accommodations to minimize impacts: (A) BMPs are sufficient to protect species (B) Special Notes are included on project plans (C) Individuals will be impacted. (D) Accommodations not practical due to broad habitat description or mobility of species	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
<i>Clematis glaucophylla</i>	White-leaved Leatherflower	--	S		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	<i>C. verticillata</i> found on rocky and sandy stream banks of larger Cumberland Plateau streams (Horn and Cathcart 2005). Last Observation Record 06.22.1999.	The Tennessee Division of Natural Areas database reports a record for the species 2.2 miles from the project limits.
<i>Dromus dromas</i>	Dromedary Pearlymussel	LE	E		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	<i>D. dromas</i> is most often observed in clean, fast-flowing water in substrates that contain relatively firm rubble, gravel, and stable, clean substrates (USFWS, 2004). Last Observation Record 10.22.1901.	The Tennessee Division of Natural Areas database reports a historic record for the species 3.9 miles from the project limits.
<i>Gratiola floridana</i>	Florida Hedge-hyssop	--	E		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	Florida Hedge-hyssop inhabits spring branches, streams banks, swamps, and ditches. The plant can be identified by its opposite toothed leaves, long pedicels, and its large, white to lilac colored flowers. Last Observation Record 05.01.2001.	The Tennessee Division of Natural Areas database reports records for the species 2.3 and 2.8 miles from the project limits.

Species Review Form

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Species Scientific Name	Species Common Name	Status		Species is potentially present in R-O-W because:	Species is considered likely NOT present in R-O-W because:	Accommodations to minimize impacts:	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
<i>Hydrolea quadrivalvis</i>	Waterpod	--	S	(A) it is listed by TDEC within ROW (B) habitat is present observed during site visit (C) critical habitat present within ROW	(A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	Waterpod is a medium-sized plant with blue axillary flowers and stout thorns. Its thick stems are covered with very visible hairs. It grows in the shallow waters of swamps and marshes and flowers in the summer. Last Observation Record 09.26.1996.	The Tennessee Division of Natural Areas database reports a record for the species 2.3 miles from the project limits.

Species Review Form

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Species Scientific Name	Species Common Name	Status		Species is potentially present in R-O-W because:	Species is considered likely NOT present in R-O-W because:	Accommodations to minimize impacts:	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
				(A) it is listed by TDEC within ROW (B) habitat is present observed during site visit (C) critical habitat present within ROW	(A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	(A) BMPs are sufficient to protect species (B) Special Notes are included on project plans (C) Individuals will be impacted. (D) Accommodations not practical due to broad habitat description or mobility of species		
<i>Percina tanasi</i>	Snail Darter	LT	T		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	<p>Snail Darter habitat includes gravel and sand runs of medium-sized rivers (Page and Burr 2011). Adults and spawning individuals inhabit sand and gravel shoals of moderately flowing, vegetated, large creeks and river; also in deeper portions of rivers and reservoirs where current is present (Etnier and Starnes 1993, Boschung and Mayden 2004). Young occur in slack water habitats, including the deeper portions of rivers and reservoirs (Boschung and Mayden 2004). Individuals often burrow into substrate (Etnier and Starnes 1993, Boschung and Mayden 2004).</p> <p>Last Observation Record 05.24.2008.</p>	The Tennessee Division of Natural Areas database reports records for the species 3.3 and 3.6 miles from the project limits.

Species Review Form

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Species Scientific Name	Species Common Name	Status		Species is potentially present in R-O-W because:	Species is considered likely NOT present in R-O-W because:	Accommodations to minimize impacts:	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
				(A) it is listed by TDEC within ROW (B) habitat is present observed during site visit (C) critical habitat present within ROW	(A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	(A) BMPs are sufficient to protect species (B) Special Notes are included on project plans (C) Individuals will be impacted. (D) Accommodations not practical due to broad habitat description or mobility of species		
<i>Quadrula intermedia</i>	Cumberland Monkeyface	LE	E		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	The Cumberland Monkeyface mussel historically inhabited the shoals and riffles of the Tennessee River from the confluence of the French Broad and Holston Rivers in Knoxville downstream to RM 120 in Perry County, TN. Remaining individuals primarily in the upper Powell River may be found living in coarse sand and gravel substrate; typically at a depth of less than 2 feet in current. (Parmalee and Bogan 1998) Last Observation Record 1900.	The Tennessee Division of Natural Areas database reports a historic record for the species 4.0 miles from the project limits.

Species Review Form

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Species Scientific Name	Species Common Name	Status		Species is potentially present in R-O-W because:	Species is considered likely NOT present in R-O-W because:	Accommodations to minimize impacts:	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
				(A) it is listed by TDEC within ROW (B) habitat is present observed during site visit (C) critical habitat present within ROW	(A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	(A) BMPs are sufficient to protect species (B) Special Notes are included on project plans (C) Individuals will be impacted. (D) Accommodations not practical due to broad habitat description or mobility of species		
<i>Rallus elegans</i>	King Rail	—	D		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	<i>R. elegans</i> (King Rail) is found freshwater marshes, upland-wetland marsh edges, rice fields or similar flooded farmlands, shrub swamps; locally in brackish and coastal salt marshes (AOU 1983, Sibley and Monroe 1990, Meanley 1969). Last Observation Record 07.30.1967.	The Tennessee Division of Natural Areas database reports a historic record for the species 4.0 miles from the project limits.

Species Review Form

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Species Scientific Name	Species Common Name	Status		Species is potentially present in R-O-W because:	Species is considered likely NOT present in R-O-W because:	Accommodations to minimize impacts:	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
				(A) it is listed by TDEC within ROW (B) habitat is present observed during site visit (C) critical habitat present within ROW	(A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	(A) BMPs are sufficient to protect species (B) Special Notes are included on project plans (C) Individuals will be impacted. (D) Accommodations not practical due to broad habitat description or mobility of species		
<i>Trillium lancifolium</i>	Narrow-leaved Trillium	--	E		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	Narrow-leaved Trillium is a small trillium with a sessile maroon blossom having 3 maroon (rarely yellow) petals up to 1.5 inches long, and is typically twisted. The stamens curve inward. <i>Trillium lancifolium</i> is one of a few of the sessile trillium whose sepals recurve down below the leaves (bracts), a species indicator. Flowering in winter--spring (Feb--early May) it inhabits alluvial soils, floodplains, rocky upland woodlands, brushy thickets, canebrakes, heavy shade, or thin, open woods; from 20--200 m in elevation. Last Observation 04.15.1985.	The Tennessee Division of Natural Areas database reports records for the species 2.2, 3.3 and 3.6 miles from the project limits.

Species Review Form

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Species Scientific Name	Species Common Name	Status		Species is potentially present in R-O-W because:	Species is considered likely NOT present in R-O-W because:	Accommodations to minimize impacts:	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
				(A) it is listed by TDEC within ROW (B) habitat is present observed during site visit (C) critical habitat present within ROW	(A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	(A) BMPs are sufficient to protect species (B) Special Notes are included on project plans (C) Individuals will be impacted. (D) Accommodations not practical due to broad habitat description or mobility of species		
<i>Trillium rugelii</i>	Southern Nodding Trillium	--	E		A	Although suitable habitat for the species is not available within the project limits, BMPs will be installed and maintained during construction activities.	Southern Nodding Trillium found in rich woodlands and forest over mafic or calcareous rocks (Weakley, In Progress); often found near (downslope) <i>Rhododendron catawbiense</i> (Wofford 1989). The general habitat is moist, but well drained. <i>Trillium rugelii</i> is found at lower slope elevations, over limestone, dolomite, or marble. Forest vegetation is dominated by closed or nearly closed canopy of mesophytic trees including calciphilic or basophilic species (Schafale and Weakley 1990). Some typical canopy species in this community include <i>Quercus muehlenbergii</i> , <i>Juglans nigra</i> , and <i>Fraxinus americana</i> (Schafale and Weakley 1990). Last Observation Record 04.22.1968.	The Tennessee Division of Natural Areas database reports historic records for the species 2.2 and 3.3 miles from the project limits.

Project: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd, PE 33003-0166-44 PIN 124069.00

Natural Areas, Management Areas, Refuges, or Similar Sites Within or Adjacent to Project Limits

(Provide topographic and aerial maps with pertinent boundaries of area marked)

Area Name	Type of Area	Pertinent Notes
N/A		

Migratory Birds

List ***significant concentrations*** of migratory birds encountered within the project area (rookeries, aggregations, nesting areas, etc).

Species (Scientific and Common Name)	Approximate No. of Nests (or Individuals)	Location of Nests (or Individuals) (Include Latitude & Longitude)	Nesting Dates and Reference	Photograph #
None				

USFWS Endangered Species Act Coordination (Section 7)

- Is the project covered using the current TDOT / USFWS Grouped Programmatic No Effect Activities? Yes No
- Is the USFWS ESA Section 7 clearance provided? Yes No N/A

Protected Bat Species

- Is there suitable habitat for protected bat species within the project limits? Yes No
- Is there a current presence / absence bat study report? Yes No
- When is the completion date of the most recent presence / absence bat study? Scheduled for Summer 2018

Biological Assessment: Yes (response letter attached; see below) No

Species (scientific and common names)	USFWS conclusion ¹

¹Choose from "no effect"; "may affect, not likely to adversely affect;" "may affect, likely to adversely affect;"; if "may affect, likely to adversely affect" is chosen, indicate "no jeopardy to species and no adverse modification to habitat" or "jeopardy to species, or adverse modification to habitat" based on US FWS Biological Opinion

Rob Howard

From: Stephanie.Ann Williams
Sent: Wednesday, March 28, 2018 4:15 PM
To: Rob Howard
Cc: Scott Medlin; Chester Sutherland; K.Brandon Chance; Colby Mann
Subject: RE: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd PIN 124069.00 - TDEC-DNH Coordination Request

Mr. Howard-

Thank you for contacting the Division of Natural Areas- Natural Heritage Program for comments on the resurfacing/bridge replacement project related to rare species. We have reviewed the information provided and do not anticipate any impacts to listed species under our authority due to limited suitable habitat within the project area.

Please contact me should you have any questions.

Kind regards-
Stephanie



Stephanie Williams | Data Manager
Division of Natural Areas – Natural Heritage Program
Tennessee Tower, 2nd Floor
312 Rosa L. Parks Avenue, Nashville, TN 37243 [MAP](#)
p. 615-532-4799 c. 256-337-3858
stephanie.ann.williams@tn.gov
TN.Gov/environment/natural-areas
[Natural Areas Facebook](#)

We value your feedback! Please complete our [customer satisfaction survey](#).

From: Rob Howard
Sent: Wednesday, March 21, 2018 8:55 AM
To: Stephanie.Ann Williams
Cc: Scott Medlin; Chester Sutherland; K.Brandon Chance; Colby Mann
Subject: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd PIN 124069.00 - TDEC-DNH Coordination Request

Ms. Williams,

TDOT proposes to replace two (2) existing bridges at I-24 at Belvoir Rd and I-24 at Germantown Rd. A Functional Plan with the marked Area of Influence is provided for your review. A more detailed plan set will be sent when available.

Also attached for your use are project location maps, project plans, a Google Earth kml file, a Species Review Map and list of protected species from the TDEC- Division of Natural Heritage

(DNH) database. Photo IMG 2705 shows Belvoir Rd Bridge over I-24. Photo IMG 2711 shows I-24 over Germantown Rd.

TDOT's Region 2 Environmental Tech Office is tasked with reviewing the project information and completing ecological studies for water resources, suitable habitat and protected species concerns. I would appreciate your review and comment related to protected species.

Your assistance in the preparation of this project is greatly appreciated. Please contact me with any questions at rob.howard@tn.gov or 931.520.2412.

Respectfully,

Rob



Rob Howard | T.E.S.S. Supervisor
Region 2 Project Development
Environmental Tech Office
PO Box 22368, Chattanooga, TN 37422-2368
p. 931.520.2412 m. 615.342.9646
rob.howard@tn.gov
tn.gov/tdot

From: [Vincent Pontello](#)
To: [Rob Howard](#)
Cc: [Rob Todd](#); [K.Brandon Chance](#)
Subject: Re: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd PIN 124069.00 - TWRA Coordination Request
Date: Monday, April 16, 2018 4:02:15 PM
Attachments: [image001.png](#)

Rob,

Thank you for the opportunity to review this project. My data concur with the information you have sent me. I do not have specific specie request for this project. The implementation of BMPs will be sufficient to satisfy the needs of the TWRA. Please contact me if you need further assistance.

Vincent L. Pontello
Wildlife Biologist
Liaison to Federal Highway Admin. & TDOT
Tennessee Wildlife Resources Agency
Environmental Services Division

From: Rob Howard
Sent: Tuesday, March 20, 2018 9:36:22 AM
To: Vincent Pontello
Cc: Rob Todd; Scott Medlin; Chester Sutherland; K.Brandon Chance; Colby Mann
Subject: Hamilton Co., I-24, Bridges at Belvoir Ave & Germantown Rd PIN 124069.00 - TWRA Coordination Request

Vince,

TDOT proposes to replace two (2) existing bridges at I-24 at Belvoir Rd and I-24 at Germantown Rd. A Functional Plan with the marked Area of Influence is provided for your review. A more detailed plan set will be sent when available.

Also attached for your use are project location maps, project plans, a Google Earth kml file, a Species Review Map and list of protected species from the TDEC- Division of Natural Heritage (DNH) database. Photo IMG 2705 shows Belvoir Rd Bridge over I-24. Photo IMG 2711 shows I-24 over Germantown Rd.

TDOT's Region 2 Environmental Tech Office is tasked with reviewing the project information and completing ecological studies for water resources, suitable habitat and protected species concerns. I would appreciate your review and comment related to protected species.

Your assistance in the preparation of this project is greatly appreciated. Please contact me with any questions at rob.howard@tn.gov or 931.520.2412.

Respectfully,

Rob



Rob Howard | T.E.S.S. Supervisor
Region 2 Project Development
Environmental Tech Office
PO Box 22368, Chattanooga, TN 37422-2368
p. 931.520.2412 m. 615.342.9646
rob.howard@tn.gov
tn.gov/tdot



**INDIANA BAT (*Myotis sodalis*) and
NORTHERN LONG-EARED BAT (*Myotis septentrionalis*)
SURVEY REPORT**

**I-24 BRIDGE OVER S GERMANTOWN ROAD
PE# 33003-0166-44 PIN: 124069.00
HAMILTON COUNTY, TENNESSEE**

**PREPARED FOR:
TENNESSEE DEPARTMENT OF TRANSPORTATION
JAMES K. POLK BUILDING – SUITE 900
505 DEADERICK STREET
NASHVILLE, TN**

**PREPARED BY:
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
325 SEABOARD LANE, SUITE 170
FRANKLIN, TN 37067**

CEC PROJECT 181-584

JUNE 27, 2018



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Figure 2 – Aerial Map of Mist Net Locations

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Appendix A – U. S. Fish & Wildlife Service Correspondence

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1.0 INTRODUCTION

This report presents the findings of an Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*) presence/probable absence mist net survey conducted for the Tennessee Department of Transportation (TDOT) by Civil & Environmental Consultants, Inc. (CEC). The survey was completed for the tree clearing activity associated with the bridges at Germantown Road LM 12.08 and Belvoir Avenue LM 12.59 in East Ridge along I-24 in Hamilton County, Tennessee.

The project is located on the southeastern side of Chattanooga in Hamilton County, Tennessee (Figure 1). The project length is approximately 0.79 linear miles (1.27 km), and is surrounded by mixed secondary growth forested tracts, commercial developments, and residential properties. The hydrologic feature within the project include one unnamed stream.

The purpose of this study was to confirm the presence or probable absence of the federally endangered Indiana bat and the federally threatened northern long-eared bat at the project area. This survey was based on CEC's professional judgment and interpretation of the technical criteria outlined in the U.S. Fish and Wildlife Service (USFWS) agency documents titled 2018 Range-wide Indiana Bat Summer Survey Guidelines dated April 2018 and Northern Long-eared Bat Interim Conference and Planning Guidance dated January 2014.

2.0 METHODOLOGY

CEC biologists traversed the project area by vehicle and on foot to identify potential bat habitat (roosting areas, feeding areas, drinking pools, and flight corridors). Our field reconnaissance was completed in order to establish mist net sites that would maximize the success of the mist net survey. Given the size, shape, and amount of forested habitat within the project area, one mist net site was completed for this project. Refer to Appendix A for the USFWS correspondence relating to the number of proposed mist net sites and proposed net nights.

The mist net site completed by CEC near the project area contained the following bat habitats: roosting areas, feeding areas, and flight corridors. This site had the highest potential to capture Indiana bats and northern long-eared bats (figures 1 and 2).

The mist net site completed by CEC included a minimum of one mist net set. All mist nets used during the survey were Avinet – USA-made 75/2 38mm mesh, polyester, reduced “bag” for bats (Avinet, Inc. - Dryden, New York). The mist nets measure 2.6 meters high, contain four shelves, and are various lengths ranging from 3 meters to 18 meters. CEC used Avinet stackable poles for single high net sets and custom built net poles that allow up to three nets to be stacked on top of each other. These custom-built net poles reach a maximum of 30 feet into the canopy. The custom-built net poles and CEC mist net surveying techniques are based upon Gardner et al. (1989), and Nagorsen and Peterson (1980).

The bat mist net survey was completed under strict adherence to the USFWS 2018 Range-wide Indiana Bat Summer Survey Guidelines dated April 2018 and Northern Long-eared Bat Interim Conference and Planning Guidance dated January 2014. All captured bats were identified by an authorized Collection Permit holder (see Appendix B for Scientific Collector’s Permits). Photographs of each mist net site are presented in Appendix C. All collections made during the survey were recorded on field data sheets, which are presented in Appendix D.

3.0 RESULTS

CEC sampled a total of 2 net nights (1 survey site x 2 nights per survey site x 1 net set per survey night = 2 net nights) from May 23 through May 24, 2018. The survey site was sampled for a minimum of five hours starting at sunset. No severe weather was encountered during the length of the survey. The following section provides a detailed description of the mist net sites and presents the results of the trapping effort at each site.

Site 1

Site 1 was sampled over a two-day period from May 23 through May 24, 2018. On the initial survey night, one mist net set (Net A, one 9-meter long, double high net) was erected over Cloudland Trail. The net spanned the entire width of the road and extended upward 20 feet closing in the canopy. No bats were captured during the first night of surveying.

On the second survey night, one mist net set (Net A, one 9-meter long, double high net) was erected over Cloudland Trail. The net spanned the entire width of the road and extended upward 20 feet closing in the canopy. No bats were captured during the second night of surveying.

4.0 CONCLUSIONS

CEC conducted an Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*) presence/probable absence mist net survey for the tree clearing activity associated with the bridges over I-24 at S Germantown Road and Belvoir Avenue located in Hamilton County, Tennessee from May 23 through May 24, 2018. No bats were captured along the proposed project area. The mist netting effort consisted of a total of 2 net nights. No Indiana bats or northern long-eared bats were captured during the survey. No additional bat surveys are recommended or warranted at this time.

5.0 LEVEL OF CARE

The Indiana bat survey services performed by CEC were conducted in a manner consistent with the criteria outlined in the USFWS, documents titled 2018 Range-wide Indiana Bat Summer Survey Guidelines, dated April 2018, and Northern Long-eared Bat Interim Conference and Planning Guidance, dated January 2014, and with the level of care and skill ordinarily exercised by members of the environmental consulting profession practicing contemporaneously under similar conditions in the locality of the project.

6.0 REFERENCES

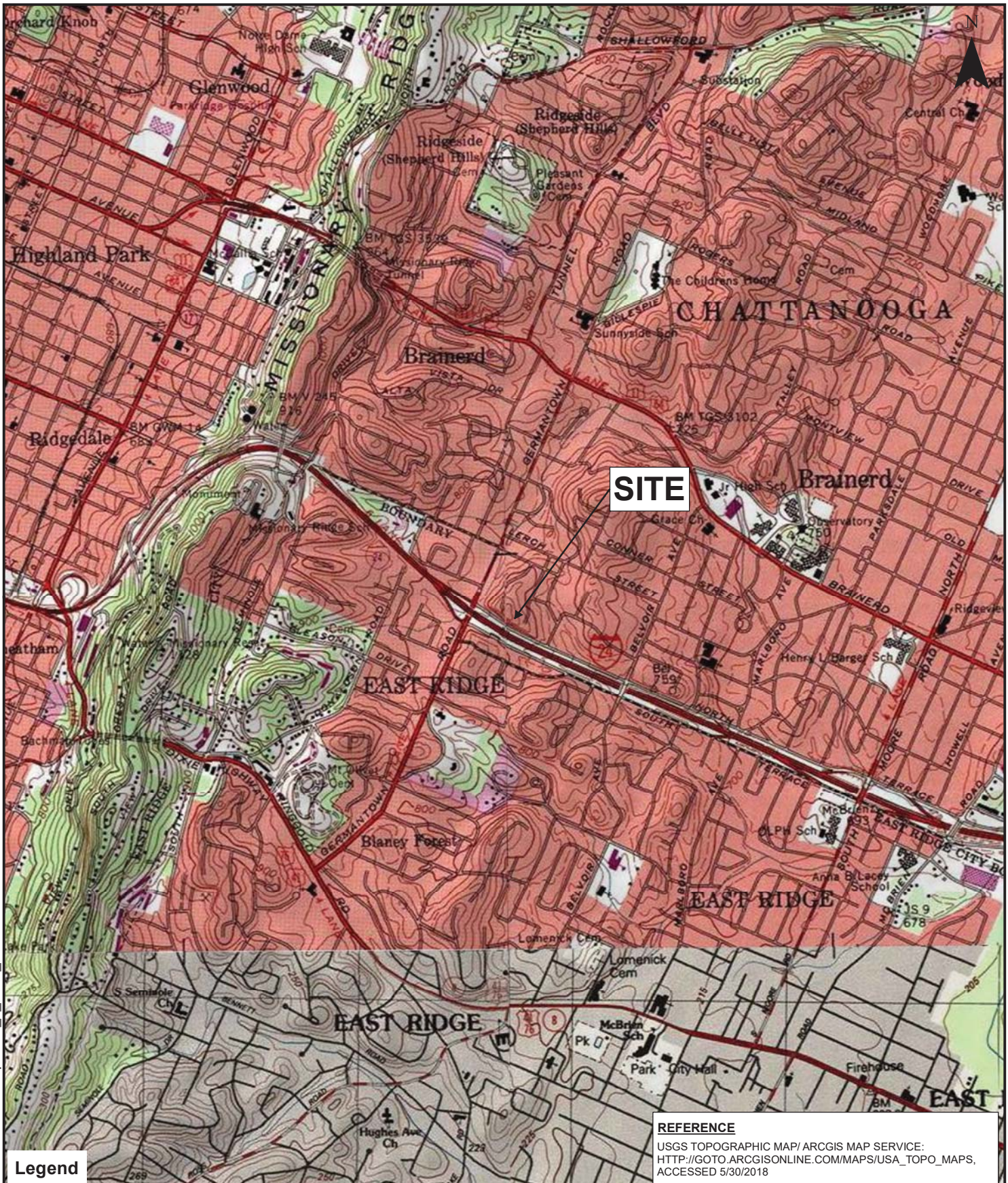
Gardner, J. E., J. D. Garner, and J. E. Hofmann. 1989. A Portable Mist-Netting System for Capturing Bats with Emphasis on *Myotis sodalis* (Indiana bat). *Bat Research News* 30:1-8.

Nagorsen, D. W.; Peterson, R. L., 1980: Mammal Collectors Manual. A Guide for Collecting, Documenting, and Preparing Mammal Specimens For Scientific Research. Belonging to the unnumbered series: Life Sciences Miscellaneous Publications. Royal Ontario Museum, Toronto. ISBN: 0-88854-255-0 pa.

U.S. Fish and Wildlife Service. 2018. 2018 Range-wide Indiana Bat Summer Survey Guidance.

U.S. Fish and Wildlife Service. 2014. *Northern Long-eared Bat Interim Conference and Planning Guidance*.

FIGURES



Legend

REFERENCE
 USGS TOPOGRAPHIC MAP/ ARCGIS MAP SERVICE:
[HTTP://GOTO.ARCGISONLINE.COM/MAPS/USA_TOPO_MAPS](http://gto.arcgis.com/arcgisonline.com/maps/usa_topo_maps),
 ACCESSED 5/30/2018

0 600 1,200 2,400 Feet

SCALE: 1:24,000

DATE: 5/30/2018

ISSUED FOR: TDOT



ISSUED BY: 
 CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
 325 Seaboard Lane, Ste 170, Franklin, TN 37067
 615-333-7797 800-763-2326
www.cecinc.com

**MIST NET SITE LOCATION
 TOPOGRAPHIC MAP
 BRIDGES AT GERMANTOWN ROAD AND
 BELVOIR AVENUE AT I-24
 HAMILTON COUNTY, TN**

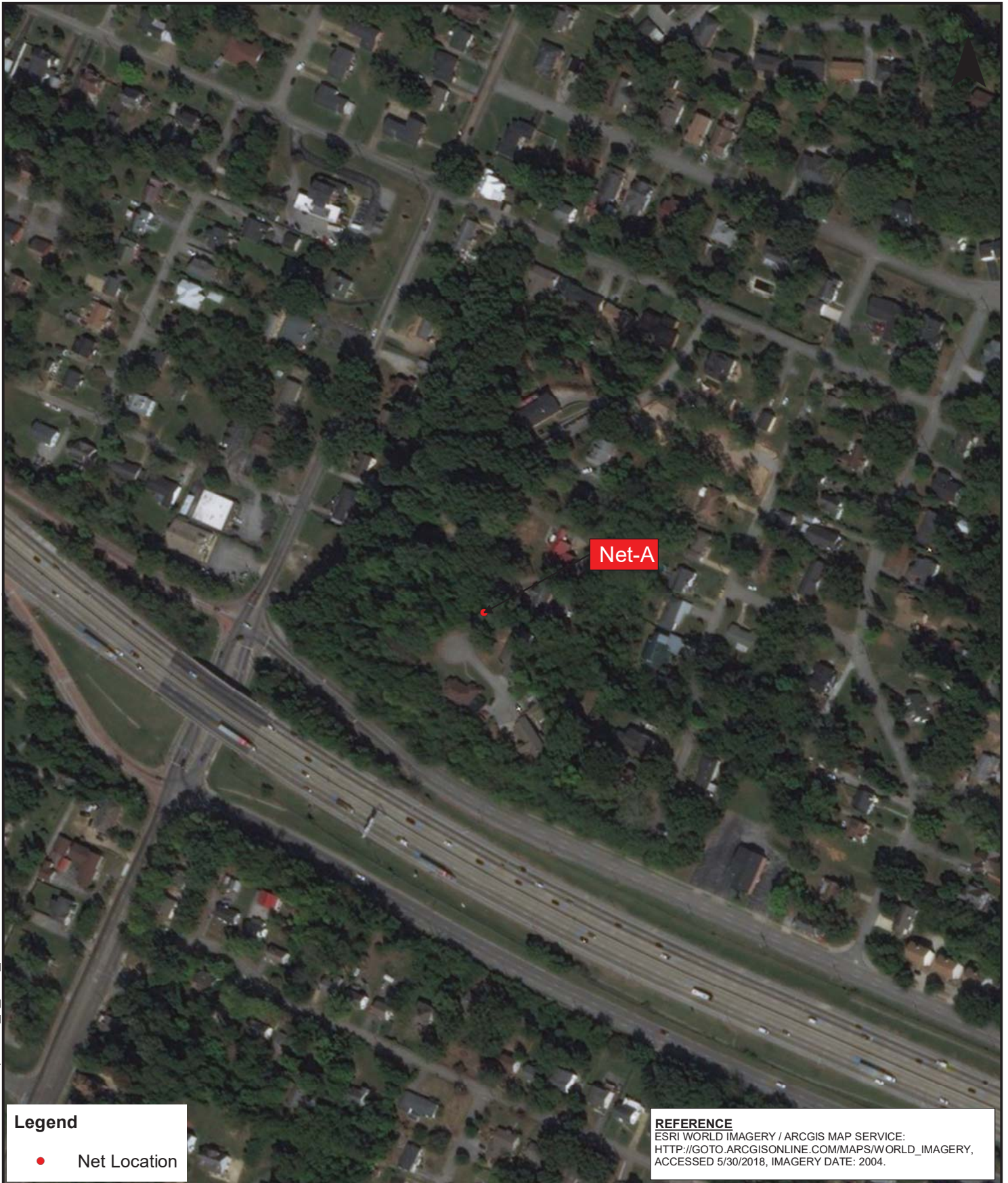
DWN. BY: CAD

APPRVD BY: TJN

* Hand signature on file

PROJECT NO.: 181-584

FIGURE 1



Net-A

Legend

- Net Location

REFERENCE
 ESRI WORLD IMAGERY / ARCGIS MAP SERVICE:
[HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY](http://gto.arcgis.com/maps/world_imagery),
 ACCESSED 5/30/2018, IMAGERY DATE: 2004.



SCALE: 1:3,000

DATE: 5/30/2018

ISSUED FOR: TDOT

ISSUED BY: 
 CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
 325 Seaboard Lane, Ste 170, Franklin, TN 37067
 615-333-7797 800-763-2326
www.cecinc.com

**MIST NET SITE LOCATION
 AERIAL MAP
 BRIDGES AT GERMANTOWN ROAD AND
 BELVOIR AVENUE AT I-24
 HAMILTON COUNTY, TN**

DWN. BY: CAD

APPRVD BY: TJN * Hand signature on file

PROJECT NO.: 181-584

FIGURE 2

APPENDIX A
U.S. FISH & WILDLIFE SERVICE CORRESPONDENCE

From: John Griffith
To: [Wilhide, Jack](#)
Subject: RE: [EXTERNAL] Request for Concurrence, Hamilton Co. I-24, PIN: 124069.00
Date: Thursday, April 19, 2018 1:21:28 PM

Looks good J.D. CEC may proceed with surveys as planned. Thanks,

John Griffith
Transportation Biologist
U.S. Fish and Wildlife Service
Tennessee Field Office
931-525-4995 (office)
931-528-7075 (fax)

From: Wilhide, Jack <jjwilhide@cecinc.com>
Sent: Thursday, April 19, 2018 11:10 AM
To: John Griffith <john_griffith@fws.gov>
Subject: [EXTERNAL] Request for Concurrence, Hamilton Co. I-24, PIN: 124069.00

John,

CEC is requesting concurrence on the above referenced project related to Indiana and Northern long-eared bat surveys. We propose to perform a mist net survey to confirm the presence/probable absence of the Indiana and Northern long-eared bat. The project length is approximately 0.79 miles (1.27 km). Due to the amount of residential and commercial development CEC proposes to survey one (1) mist net site for 2 nights (1 site x 2 nights x 1 net per site = 2 net nights). The mist net survey is scheduled to start in late May or early June, weather permitting. The mist net survey will follow the 2018 Range-Wide Indiana Bat Summer Survey Guidelines. Please let me know if you have any questions or need additional information.

Thank you,

J. D. Wilhide / Project Manager
Civil & Environmental Consultants, Inc.
325 Seaboard Lane · Suite 170 · Franklin, TN 37067
Toll-Free: (800) 763-2326 · Fax: (615) 333-7751
Mobile: (615) 887-0086 <http://www.cecinc.com>
Senior Leadership · Integrated Services · Personal Business Relationships

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APPENDIX B
SCIENTIFIC COLLECTION PERMIT

NATIVE ENDANGERED & THREATENED SP. RECOVERY
ENDANGERED & THREATENED WILDLIFE**Permit Number: TE148282-5**

Effective: 12/13/2017 Expires: 02/28/2021

Issuing Office:

Department of the Interior
U.S. FISH & WILDLIFE SERVICE
Ecological Services Permit Office
1875 Century Boulevard
Atlanta, GA 30345
permitsR4ES@fws.gov

CHIEF, DIVISION OF ENVIRONMENTAL REVIEW

Permittee:

JACK (J.D.) D. WILHIDE
dba CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
325 SEABOARD LANE, SUITE 170
FRANKLIN, TN 37067
U.S.A.

Authority: Statutes and Regulations: 16 USC 1539(a), 16 USC 1533(d); 50 CFR 17.22, 50 CFR 17.32, 50 CFR 13.

Location where authorized activity may be conducted:

Alabama, Arkansas, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.

Reporting requirements:

Annual reports are due by January 31 following each year that this permit is in effect.

Authorizations and Conditions:

A. General conditions set out in Subpart B of 50 CFR 13, and specific conditions contained in Federal regulations cited above, are hereby made a part of this permit. All activities authorized herein must be carried out in accordance with and for the purposes described in the application submitted. Continued validity, or renewal of this permit is subject to complete and timely compliance with all applicable conditions, including the filing of all required information and reports.

B. The validity of this permit is also conditioned upon strict observance of all applicable foreign, state, local tribal, or other federal law.

C. The following individuals are authorized to conduct activities as authorized by this permit: ***All Species/All Activities/All Locations:*** Mr. Jack (J.D.) Wilhide;
Gray Bat, Indiana Bat, Northern Long-eared Bat/All Activities except entering hibernacula or maternity roost caves/All Locations: Scott M. Bergeson;
Indiana Bat, Northern Long-eared Bat/Mist-netting, handling, banding, radio-tagging only/Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee only: Caleb A. Duke.

Trained assistants not named on this permit may work on permitted bat activities under the direct and on-site supervision of the individuals named above. However, trained assistants may not work independently at a site.



Trained assistants are individuals who are considered qualified by the permitted biologist(s) to select sampling sites, deploy sampling equipment and nets, and handle bats in the field.

Permittee must remain present at each mist-net and harp trap site while it is being operated.

D. Acceptance of this permit serves as evidence that the permittee understands and agrees to abide by the terms of this permit and all sections of title 50 Code of Federal Regulations, parts 13 and 17, pertinent to issued permits. Section 11 of the Endangered Species Act of 1973, as amended, provides for civil and criminal penalties for failure to comply with permit conditions. In addition, the permittee shall have all other applicable Federal, Tribal, State, and/or local government permits prior to the commencement of activities authorized in this permit.

E. Permittee is authorized to take (enter hibernacula or maternity roost caves, capture with mist nets or harp traps, handle, identify, collect hair samples, band, radio tag, light-tag, and wing-punch) Indiana bats (*Myotis sodalis*), gray bats (*Myotis grisescens*), northern long-eared bats (*Myotis septentrionalis*), Ozark big-eared bats (*Corynorhinus townsendii ingens*), and Virginia big-eared bat (*Corynorhinus townsendii virginianus*) while conducting presence/absence surveys, studies to document habitat use, and population monitoring, as described in permittee's applications and as conditioned below.

F. The permitted activities described above require prior, site-specific approval from the U.S. Fish and Wildlife Service (USFWS) Field Supervisor in the state(s) where the project will occur. Permittee shall notify the USFWS Field Supervisor for the state in which activities are proposed to occur at least 15 days prior to conducting any activities. Contact information is in Condition P., below. Your request for this site-specific approval must be in writing and must indicate:

F.1. The purpose and a description of the activities proposed (e.g., surveys, radio telemetry studies, etc.). If the purpose includes wing punching and/or collection of hair samples for genetic analyses or other purposes, a copy of the specific study proposal must be included.

F.2. Location of proposed activities, including project site (legal description and lat/long), county, and state.

F.3. Dates when the project is proposed to take place.

F.4. You may proceed with activities only upon receipt of written concurrence from the applicable USFWS Field Supervisor. *Your concurrence letter must be carried with this permit to authorize site-specific activities.*

G. Permittee shall adhere to the following conditions involving capture and handling of bats:

G.1. Federally listed bats may be captured (e.g., mist-nets and harp traps) following the protocol(s) provided by the USFWS, when available. Permittee must contact the USFWS Field Supervisor in the state(s) in which activities are proposed to ensure correct protocol(s) are used. For example, the current Range-wide Indiana Bat Summer Survey Guidelines are available at:

<http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html>. The monitoring interval for mist nets is once every 10 minutes. Harp traps must be continually monitored.

G.2. Captured bats may be held for a maximum of 30 minutes, unless injured. If an exception is required to this prohibition, permittee must receive prior written approval from the USFWS Field Supervisor for the state in which the activities are proposed to occur.



- G.3. Permittee may carry out non-intrusive measurements on all captured bats. Data shall be recorded for all bats captured and include, but not be limited to, the data requested in any automated or species-specific data form provided by the USFWS (e.g., USFWS Bat Reporting Form available at: <http://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html>). Handling should be limited to the maximum extent practicable and should cease immediately at signs of undue stress (e.g., bat becoming unresponsive, etc.). Bats that appear stressed from handling should be placed in a dark, quiet location away from activity where it can safely fly away after recovery, and should be checked to ensure successful recovery before leaving the study site. Photographs of the identifying characteristics for each individual federally listed species captured are encouraged. The permittee may be requested to provide individual photographs after submittal of annual reporting data.
- G.4. If bands are applied; they must be lipped metal bands having a unique identifier. Bands should be applied to the forearm of captured bats prior to release. No more than one band per bat may be used. Position the band on the wing so that when the bat is hanging upside down, the band numbers are right-side up. A single band should be placed on the right forearm of each male and the left forearm of each female bat.
- G.5. Radio transmitters may be applied during spring, summer, and fall roosting and migration periods via nontoxic skin bond adhesive. The total weight of the transmitter may not exceed 5% of the bat's body weight and the total weight of the package (transmitter and adhesive) may not exceed 6% of the bat's body weight. The lightest package (both transmitter and adhesive) capable of accomplishing the required task should be used, especially with pregnant females and newly volant juveniles. Bats carrying transmitters must be monitored daily for at least five days, or until the transmitter falls off, whichever occurs first. **** Although not required as a condition of this permit, in order to gather needed information to promote the conservation of the northern long-eared bat, it is recommended that the permittee radio-track female and juvenile northern long-eared bats captured when conducting mist-netting and radio-tracking of Indiana bats within the white-nose syndrome (WNS) zone of the range of the northern long-eared bat. Specifics on the number of females and juvenile bats to be tracked will be determined in coordination with the appropriate Field Office, as specified in Condition F (above).***
- G.6. No capture activities shall occur within 20 meters of a known or potential summer or winter roost site, either natural or artificial, of a federally listed bat. If an exception is required to this prohibition, permittee must receive prior written approval from the USFWS Field Supervisor for the State in which the activities are proposed to occur.
- G.7. Permittee may collect dorsal hair samples and wing biopsy tissue samples from captured bats for scientific study. Hair samples shall be obtained via clipping fur from between scapula from females and juvenile males. The clipped area is the same area frequently clipped for radio transmitter attachment. Wing tissue samples may be taken using a new, sterile biopsy punch (2mm) for each endangered bat sampled. No more than two samples, one from each wing, may be obtained per individual. All boards and equipment used to obtain samples must be disinfected according to the protocol cited in Condition G.9.
- G.8. Cyalume light tags may be affixed to the back of unmarked bats during summer roosting period via non-toxic skin bond adhesive to aid in identification of individuals for echolocation recordings. Light tags shall not be affixed to bats carrying radio transmitters. Light tag cannot exceed 2 cm in length or 0.15 g in weight. The light tag must be resistant to tooth puncture and sealed to prevent bats from ingesting cyalume compound. Any light tag that has the potential to expose bats to the cyalume compound is prohibited; the compound is known to be toxic to bats.
- G.9. Equipment used to capture and handle bats shall be cleaned and decontaminated, including personal gear such



as boots and gloves, using products cited in decontamination guidelines and in compliance with label directions. The most recent decontamination guidance is found on the web at: <http://whitenosesyndrome.org/>.

G.10. Caves mines or other suitable hibernation sites may be quietly searched in a manner that minimizes disturbance by utilizing the minimum number of people and time required to complete the survey. Surveys of known hibernacula conducted during the winter hibernation season shall follow the guidelines established in the recovery plans for each federally listed bat species with regards to how often a site may be visited and other species-specific requirements related to entering hibernaculum. Under no circumstances should multiple trips to the hibernation area occur within the same year without written approval of the USFWS Field Supervisor for the state in which activities are proposed.

Bats may be handled during winter surveys in order to collect band information and confirm the identification of listed species. When possible, bands should be read without touching the bat. Banded bats should only be handled if easily accessible and removal of the bat does not disturb a large number of additional bats and is unlikely to result in injury to the bat. Detailed photographs should be taken to document the presence of listed species in previously undocumented hibernaculum. Where hibernacula area and safety conditions allow, individuals entering hibernacula are recommended to utilize night vision goggles or red-filtered light and to remain in the site no more than 90 minutes to complete the work.

G.11. Surveys of gray bat, Ozark big-eared bat, or Virginia big-eared bat maternity roosts and their other known summer roost sites shall be conducted by observing the bats with night vision equipment and/or infrared light sources (e.g., thermal infrared) as they emerge from their roosts to avoid any possible disturbance to these bats. At previously undocumented sites for these species, the accepted method to determine if they are present is to carefully and slowly enter the potential roost site to check for evidence of presence/use, such as visual observation of bats, significant quantities or a strong smell of guano, or the audible sounds produced by bats roosting at the site. As soon as any evidence is obtained that the roost site is being used by a federally-listed bat species, survey team members shall immediately exit the roost site and make further observations from outside the entrance to the roost. All further observations shall be made from the entrance during the evening emergence.

H. Upon determination that endangered or threatened bats are present, permittee shall notify the following offices immediately (not to exceed 1 business day): the USFWS Southeast Regional Office (Condition N.3.), and the USFWS Field Office within the geographic location of study areas (Condition P.).

I. Permittee must carry a copy of this permit at all times when conducting the authorized activities. Shipments of collected biological materials should also be accompanied by a copy of this permit. NOTE: This permit is limited to the above activities and identified species.

J. Issuance of this permit does not constitute permission to conduct these activities on National Wildlife Refuges or any other public or private lands; such permission must be obtained separately from the appropriate landowner or land manager before beginning these authorized activities. This permit, neither directly nor by implication, grants the right of trespass.

K. The USFWS anticipates that no federally listed bats will be injured or killed as a result of permitted activities. If any injury or mortality does occur, the permittee shall immediately notify the appropriate Species Recovery Lead(s) noted in Condition O., below. Notification shall also be made within 24 hours to the Southeast Regional Permit Coordinator and appropriate Field Office, at the addresses and telephone numbers noted in Conditions N.3. and P., below. Based on consultation between these offices, a decision will be made as to whether any of the authorized activities can continue. Decisions will also be made concerning the disposition of any dead or injured specimens.



The permittee shall provide a written statement to the USFWS offices noted in Conditions N, O, and P, below, which documents the cause of the injury or mortality, and identifies the remedial measures employed by the permittee to eliminate future mortality or injury events. The final decision on remedial measures and disposition of specimens rests with the USFWS.

Upon locating a dead, injured, or sick listed species, under circumstances not addressed in this authorization, initial notification must be made immediately to the USFWS field office in the state in which the specimen is found, identified in Condition P., below. Notification should also be made by the next work day to the Service's Southeast Regional Office identified in Condition N.3., below. Care should be taken in handling sick, injured, or dead specimens to ensure effective treatment or to preserve biological materials for later analysis. In conjunction with the care of sick or injured endangered or threatened species, and the preservation of biological materials from a dead animal, the finder should take responsible steps to ensure that the site is not unnecessarily disturbed.

L. This permit is non-transferable.

M. An annual report summarizing authorized activities must be submitted by January 31 following each year this permit is valid. Each report should include, at a minimum, the following information:

M.1. The date, time, geographic locations (including datum and projection information).

M.2. All locations surveyed (regardless of whether federally-listed bats were captured/observed).

M.3. Band numbers of all bats banded.

M.4. Information on any injuries and/or mortalities and disposition of specimens.

M.5. Location and characteristics of roost trees and bat colonies.

M.6. Copies of any separate reports and/or publications resulting from work conducted under the authority of this permit.

M.7. Data shall be submitted for all bats captured and include, but not be limited to, the data requested in any automated or species-specific data form provided by the USFWS (e.g., USFWS Bat Reporting Form available at: <http://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html>). Photographs of the identifying characteristics for each individual federally-listed species captured are encouraged. The Permittee may be requested to provide individual photographs after submittal of annual reporting data.

M.8. Copies of all site-specific authorization letters required under Condition F.

IF NO ACTIVITIES OCCURRED OVER THE COURSE OF THE YEAR, INDICATION OF SUCH SHALL BE SUBMITTED AS AN ANNUAL REPORT.

N. Copies of your reports shall be sent to the offices listed below. When possible, electronic copies shall be submitted in lieu of hard copies in MS Word, Portable Document Format, Rich Text Format, or other file format that is compatible with the receiving office.

N.1.

APPENDIX C
PHOTOGRAPHS

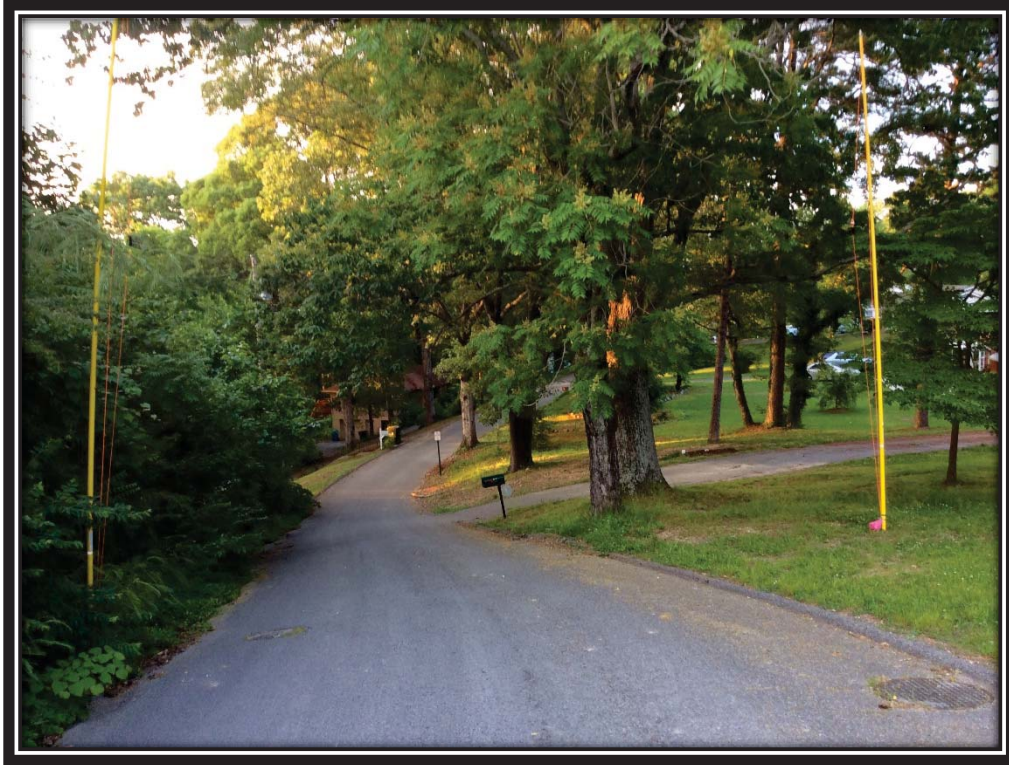


Photo 1: View of Net A facing northeast at N35.0149579;W85.25014437.



Photo 2: View of Net A facing southwest at N35.0149579;W85.25014437.

APPENDIX D
CIVIL & ENVIRONMENTAL CONSULTANTS DATA SHEETS

CEC Bat Capture Data Sheet

Site No. <u>1 Net A</u>	Project Name: <u>181-584</u>	Date: <u>5/23/18</u>
County: <u>Hamilton</u>	State: <u>TN</u>	Client: <u>FDOT</u>
Photo #: <u>1 & 2</u>	Permit # (State & Fed): <u>TE148 282-5</u>	
		Surveyors: <u>C. Dunc, C. Lassitt</u>

#	Time	Species	Age	Sex	Repro. Cond.*	RFA (mm)	Mass (g)	Net/ Ht	Guano/ Hair	Wing Score	Band # Type	Moon Phase:	%			
1												<u>Waxing Gibbous</u>	<u>70</u>			
2												Rise	Set			
3												Moon: <u>3:05 PM</u>	<u>3:17 AM</u>			
4												Sun: <u>6:23 AM</u>	<u>8:45 AM</u>			
												Time	Temp	Sky**	Wind***	# Bats
5												<u>21:00</u>	<u>25.80c</u>	<u>1</u>	<u>0</u>	<u>0</u>
6												<u>22:00</u>	<u>25.5c</u>	<u>1</u>	<u>0</u>	<u>0</u>
7												<u>23:00</u>	<u>24.0c</u>	<u>0</u>	<u>0</u>	<u>0</u>
8												<u>24:00</u>	<u>24.0c</u>	<u>0</u>	<u>0</u>	<u>0</u>
9												<u>01:00</u>	<u>22.7</u>	<u>0</u>	<u>0</u>	<u>0</u>
10												<u>01:30</u>	<u>22.0c</u>	<u>0</u>	<u>0</u>	<u>0</u>
11																
12																
13																
14																
15																
16																
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22																
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27																
28																
29																
30																

NO BATS
Captured

Moon Phase: <u>Waxing Gibbous</u>		% <u>70</u>		
	Rise	Set		
Moon:	<u>3:05 PM</u>	<u>3:17 AM</u>		
Sun:	<u>6:23 AM</u>	<u>8:45 AM</u>		
Time	Temp	Sky**	Wind***	# Bats
<u>21:00</u>	<u>25.80c</u>	<u>1</u>	<u>0</u>	<u>0</u>
<u>22:00</u>	<u>25.5c</u>	<u>1</u>	<u>0</u>	<u>0</u>
<u>23:00</u>	<u>24.0c</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>24:00</u>	<u>24.0c</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>01:00</u>	<u>22.7</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>01:30</u>	<u>22.0c</u>	<u>0</u>	<u>0</u>	<u>0</u>
Ave				
Net(s) and/or Acoustic Unit(s) Lat/Long (DD.dddd):				
#	N	W		
<u>A</u>	<u>35.0149579</u>	<u>-85.25014437</u>		
<u>B</u>				
<u>C</u>				
<u>1</u>				
<u>2</u>				
Acoustic Unit Serial #		Brand		
<u>1</u>	<u>1</u>	<u>1</u>		
<u>2</u>				
<u>3</u>				

*Repro. Cond (Reproductive Condition): (P) pregnant; (L) lactating; (PL) post-lactating; (NR) non-reproductive, (TD) testes descended
 ** Sky Code: 0- Clear, 1- Few Clouds, 2- Partly Cloudy, 3- Cloudy or Overcast, 4- Smoke or Fog, 5- Drizzle or Light rain, 6- Thunderstorm
 *** Wind Code : 0- Calm (0 mph), 1- Light wind (1-3 mph), 2- Light breeze (4-7 mph), 3- Gentle breeze (8-12 mph), 4- Moderate breeze (13-18 mph)

CEC Bat Capture Data Sheet

Site No. <u>1 NGA</u>	Project Name: <u>181-584</u>	Date: <u>5/24/18</u>
County: <u>Hamilton</u>	State: <u>TN</u>	Client: <u>TOOT</u>
Photo #: <u>1+2</u>	Permit # (State & Fed): <u>TE148282-5</u>	
Surveyors: <u>C. Duke, C. Liggett</u>		

#	Time	Species	Age	Sex	Repro. Cond.*	RFA (mm)	Mass (g)	Net/Ht	Guano/Hair	Wing Score	Band # Type
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
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18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

NO BATS
Captured

Moon Phase: <u>Waxing Gibbous</u>		% <u>77%</u>
	Rise	Set
Moon:	<u>4:05 pm</u>	<u>3:52 am</u>
Sun:	<u>6:32 am</u>	<u>8:45 am</u>

Time	Temp	Sky**	Wind***	# Bats
<u>21:00</u>	<u>27.8C</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>22:00</u>	<u>26.3C</u>	<u>0</u>	<u>1</u>	<u>0</u>
<u>23:00</u>	<u>26.0C</u>	<u>0</u>	<u>1</u>	<u>0</u>
<u>24:00</u>	<u>25.0C</u>	<u>0</u>	<u>1</u>	<u>0</u>
<u>01:00</u>	<u>24.7</u>	<u>0</u>	<u>1</u>	<u>0</u>
Ave				

Net(s) and/or Acoustic Unit(s) Lat/Long (DD.dddd):		
#	N	W
A	<u>35.0149579</u>	<u>-85.29017937</u>
B		
C		
1		
2		

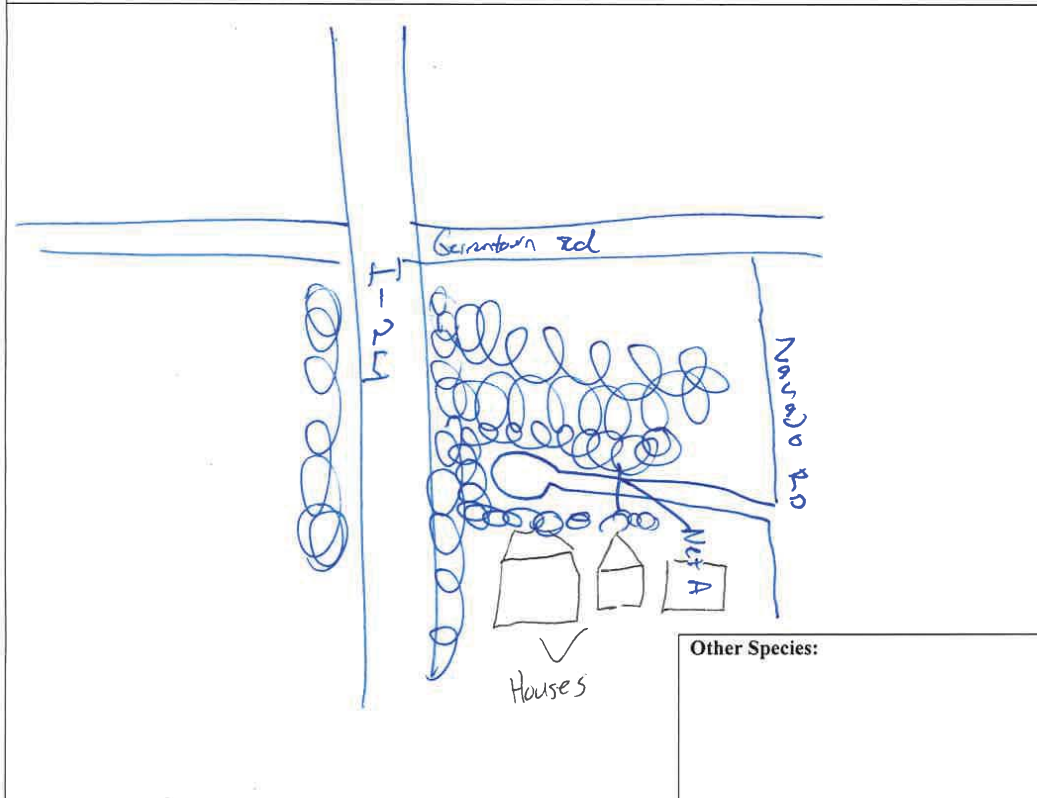
Acoustic Unit Serial #	Brand
1	
2	
3	

Few bats present flying close to nets.

*Repro. Cond (Reproductive Condition): (P) pregnant; (L) lactating; (PL) post-lactating; (NR) non-reproductive, (TD) testes descended
 ** Sky Code: 0- Clear, 1- Few Clouds, 2- Partly Cloudy, 3- Cloudy or Overcast, 4- Smoke or Fog, 5- Drizzle or Light rain, 6- Thunderstorm
 *** Wind Code : 0- Calm (0 mph), 1- Light wind (1-3 mph), 2- Light breeze (4-7 mph), 3- Gentle breeze (8-12 mph), 4- Moderate breeze (13-18 mph)

*

Site No.: 1 Net A	Project Name: 181-584	Date: 5/23-24/18
Net Site Diagram		Dominant Vegetation



- 1 Black walnut
- 2 Red oak
- 3 Slotted pine
- 4 White oak
- 5 Chestnut oak

Net(s) or Acoustic Unit(s) by Habitat				
Habitat	A	B	C	Acoustic
River				
Stream				
Pond				
Road Rut				
Corridor	x			
Cave/mine				
Total				

No. of Poles X Net length				
A	=	2	X	9
B	=		X	
C	=		X	
D	=		X	

Other Species:

Comments:



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION**

REGION 2 PROJECT DEVELOPMENT
7512 VOLKSWAGEN DRIVE
CHATTANOOGA, TENNESSEE 37416
(423) 510-1165

JOHN C. SCHROER
COMMISSIONER

BILL HASLAM
GOVERNOR

28 June 2018

John Griffith
US Dept. of Interior
Fish and Wildlife Service
446 Neal St.
Cookeville, TN 38501

Subject: 2018 Bat Survey Report and Section 7 Coordination

Hamilton Co., I-24 Bridges at Germantown Road LM 12.08 and Belvoir Avenue LM 12.59
PE 33003-0166-44, PIN 124069.00

Dear Mr. Griffith:

TDOT proposes to replace two (2) existing bridges at I-24 at Belvoir Road and I-24 at Germantown Road. Functional Plans with the area of influence marked are provided for your review.

A bat mist net survey was completed by Civil and Environmental Consultants, Inc. (CEC) from 23-24 May 2018. The purpose of the survey was to determine possible presence of the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*) within the project area. Attached, please find a copy of CEC's 27 June 2018 Bat Survey Report for the subject project. CEC reports no captures for *M. sodalis* or *M. septentrionalis*.

Based on the negative survey results, TDOT concludes the proposed project “**may affect, not likely to adversely affect**” the federally endangered Indiana bat (*M. sodalis*).

Based on the negative survey results, TDOT concludes the proposed project “**may affect, not likely to adversely affect**” the federally threatened northern long-eared bat (*M. septentrionalis*).

TDOT's Region 2 Environmental Tech Office is tasked with reviewing the project information and completing ecological studies for water resources, suitable habitat and protected species concerns. In compliance with the Fish and Wildlife Act of 1958, and the Endangered Species Act of 1973 (amended), TDOT requests a list of threatened and/or endangered species that may be present in the vicinity of the proposed project. I would appreciate your review and comment related to protected species and regarding concurrence for these determinations.

If you have any questions or need additional information, please contact me at k.brandon.chance@tn.gov or (931) 520-2418.

Respectfully,

Brandon
Chance

Digitally signed by Brandon Chance
DN: cn=Brandon Chance, o=TDOT,
ou=Region 2 Project Development -
Environmental Tech Office - Ecology,
email=k.brandon.chance@tn.gov, c=US
Date: 2018.06.28 09:15:52 -0500



K. Brandon Chance | T.E.S.S. Advanced
Region 2 Project Development
Environmental Tech Office - Ecology
7512 Volkswagen Drive Chattanooga, TN 37416
p. 931-520-2418 m. 865-206-5509
k.brandon.chance@tn.gov
tn.gov/tdot



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Tennessee ES Office
446 Neal Street
Cookeville, Tennessee 38501

July 23, 2018

Mr. Brandon Chance
T.E.S.S. Advanced
Region 2 Project Development
Environmental Tech Office - Ecology
P.O. Box 22368
Chattanooga, Tennessee 37422

Subject: FWS# 18-CPA-0626. Proposed Interstate 24 bridge replacements at Germantown Road and Belvoir Avenue; PIN# 124069.00, P.E. 33003-0166-44, Hamilton County, Tennessee.

Dear Mr. Chance:

Thank you for your letter dated June 28, 2018, transmitting bat survey results for the proposed Interstate 24 bridge replacements at Germantown Road and Belvoir Avenue in Hamilton County, Tennessee. The Tennessee Department of Transportation (TDOT) has determined that the project is “not likely to adversely affect” the federally endangered Indiana bat (*Myotis sodalis*) or threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*) based on negative survey results. Personnel of the U.S. Fish and Wildlife Service have reviewed the subject proposal and offer the following comments.

A mist netting survey was performed in May 23 and May 24, 2018, at one site determined to be a suitable netting location. Efforts resulted in no bat captures. Due to negative survey results for the Indiana bat and NLEB, we concur with TDOT’s determinations of “not likely to adversely affect” for these species. This survey will be valid until April 1, 2024.

We are not aware of any other federally listed or proposed species that would be impacted by the project. Therefore, based on the best information available at this time, we believe that the requirements of section 7 of the Endangered Species Act (Act) of 1973, as amended, are fulfilled for all species that currently receive protection under the Act. Obligations under section 7 of the Act should be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

If you have any questions regarding our comments, please contact John Griffith at 931/525-4995 or by email at john_griffith@fws.gov.

Sincerely,

Michael Gale
Field Supervisor (Acting)

xc: Vincent Pontello, TWRA, Crossville, TN

Air and Noise

Environmental Study

Technical Section

Section: Air and Noise

Study Results

AIR QUALITY

Transportation Conformity

This project is in Hamilton County which is in attainment for all regulated criteria pollutants. Therefore, conformity does not apply to this project.

Mobile Source Air Toxics (MSATs)

This project qualifies as a categorical exclusion under 23 CFR 771.117 and does not require a Mobile Source Air Toxics (MSATs) evaluation per FHWA's "Interim Guidance Update on Air Toxic Analysis in NEPA Documents" dated October 2016.

NOISE

This project is Type III in accordance with the FHWA noise regulation in 23 CFR 772 and TDOT's noise policy; therefore, a noise study is not needed.

Commitments

Did the study of this project result in any environmental commitments?

No

Additional Information

Is there any additional information or material included with this study?

No

Certification

Responder: Darlene D Reiter

Title: TDOT Environmental Division Consultant

Signature: Darlene D
Reiter

Digitally signed by
Darlene D Reiter
Date: 2018.03.19
12:38:30 -05'00'

Cultural Resources

Environmental Study

Technical Section

Section: Cultural Resources and Native American Coordination

Study Results

Pursuant to 36 CFR 800.14(c), Exempted Categories, federal agencies are exempt from the Section 106 requirement of taking into account the effects of the undertaking on the Interstate Highway System (IHS) unless individually designated elements of the IHS are listed or eligible for listing on the National Register of Historic Places (NRHP) and within the area of potential effects, defined as the existing interstate right-of-way. The IHS in Tennessee has been evaluated for its NRHP eligibility and only two individual elements were identified, the Interstate 40 and Interstate 55 bridges over the Mississippi River in Shelby County. As no other individual elements of the IHS in Tennessee are listed or eligible for listing on the NRHP, and as the undertaking is limited to existing interstate right-of-way, and as the potential effects on any adjacent or contiguous non-IHS historic properties are likely to be minimal or not adverse, it is the opinion of TDOT that the undertaking meets the conditions of the Section 106 Exemption Regarding Effects to the Interstate Highway System and no further Section 106 review or consultation is warranted based on the current design. This exemption does not apply if non-interstate routes or structures are included as part of the undertaking or if new right-of-way is required.

Commitments

Did the study of this project result in any environmental commitments?

No

Additional Information

Is there any additional information or material included with this study?

No

Certification

Responder: Alan Longmire

Title: TESS Adv. Archaeologist

Signature: C. Alan Longmire,
RPA 11196

Digitally signed by C. Alan Longmire, RPA 11196
DN: cn=C. Alan Longmire, RPA 11196,
o=TDOT, ou=Environmental Studies
Specialist Advanced, Archaeologist,
email=Alan.Longmire@tn.gov, c=US
Date: 2018.03.19 15:38:16 -0400

Environmental Justice



C17002

RATIO OF INCOME TO POVERTY LEVEL IN THE PAST 12 MONTHS

Universe: Population for whom poverty status is determined
2012-2016 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Tell us what you think. Provide feedback to help make American Community Survey data more useful for you.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

	Hamilton County, Tennessee		Block Group 1, Census Tract 4, Hamilton County, Tennessee		Block Group 2, Census Tract 4, Hamilton County, Tennessee	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	341,249	+/-742	1,462	+/-345	2,305	+/-680
Under .50	21,159	+/-1,700	202	+/-109	279	+/-268
.50 to .99	29,472	+/-1,681	210	+/-135	166	+/-101
1.00 to 1.24	17,016	+/-1,743	223	+/-238	544	+/-498
1.25 to 1.49	16,086	+/-1,619	189	+/-152	269	+/-235
1.50 to 1.84	24,224	+/-2,089	131	+/-108	344	+/-234
1.85 to 1.99	8,596	+/-945	104	+/-83	17	+/-18
2.00 and over	224,696	+/-2,612	403	+/-220	686	+/-266

	Block Group 1, Census Tract 28, Hamilton County, Tennessee		Block Group 2, Census Tract 28, Hamilton County, Tennessee		Block Group 3, Census Tract 28, Hamilton County, Tennessee	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	1,128	+/-196	834	+/-173	1,541	+/-275
Under .50	12	+/-20	14	+/-17	47	+/-45
.50 to .99	26	+/-57	140	+/-102	169	+/-139
1.00 to 1.24	9	+/-15	36	+/-31	16	+/-20
1.25 to 1.49	0	+/-12	0	+/-12	95	+/-74
1.50 to 1.84	21	+/-34	10	+/-16	182	+/-136
1.85 to 1.99	0	+/-12	0	+/-12	16	+/-23
2.00 and over	1,060	+/-185	634	+/-160	1,016	+/-225

	Block Group 6, Census Tract 116, Hamilton County, Tennessee		Block Group 1, Census Tract 117, Hamilton County, Tennessee		Block Group 2, Census Tract 117, Hamilton County, Tennessee	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	1,190	+/-260	1,743	+/-491	1,026	+/-526
Under .50	72	+/-59	0	+/-12	6	+/-8
.50 to .99	131	+/-135	10	+/-17	130	+/-146
1.00 to 1.24	86	+/-90	355	+/-408	324	+/-463
1.25 to 1.49	130	+/-99	163	+/-177	22	+/-27
1.50 to 1.84	85	+/-79	228	+/-306	12	+/-20
1.85 to 1.99	0	+/-12	0	+/-12	13	+/-21
2.00 and over	686	+/-258	987	+/-370	519	+/-190

	Block Group 3, Census Tract 117, Hamilton County, Tennessee		Block Group 4, Census Tract 117, Hamilton County, Tennessee		Block Group 1, Census Tract 118, Hamilton County, Tennessee	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	1,034	+/-277	1,122	+/-391	1,729	+/-444
Under .50	59	+/-54	64	+/-96	74	+/-70
.50 to .99	63	+/-70	195	+/-288	235	+/-311
1.00 to 1.24	13	+/-23	0	+/-12	11	+/-19
1.25 to 1.49	121	+/-135	69	+/-66	0	+/-12
1.50 to 1.84	44	+/-37	140	+/-139	94	+/-117
1.85 to 1.99	0	+/-12	0	+/-12	207	+/-179
2.00 and over	734	+/-258	654	+/-191	1,108	+/-320

	Block Group 5, Census Tract 118, Hamilton County, Tennessee		Block Group 6, Census Tract 118, Hamilton County, Tennessee		Block Group 1, Census Tract 119, Hamilton County, Tennessee	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	1,599	+/-372	762	+/-230	807	+/-201
Under .50	102	+/-100	20	+/-32	21	+/-21
.50 to .99	163	+/-126	33	+/-41	0	+/-12
1.00 to 1.24	341	+/-258	32	+/-61	72	+/-49
1.25 to 1.49	233	+/-365	0	+/-12	128	+/-92
1.50 to 1.84	47	+/-46	53	+/-65	50	+/-38
1.85 to 1.99	84	+/-138	0	+/-12	35	+/-55
2.00 and over	629	+/-247	624	+/-237	501	+/-211



B03002

HISPANIC OR LATINO ORIGIN BY RACE
Universe: Total population
2012-2016 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Tell us what you think. Provide feedback to help make American Community Survey data more useful for you.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

	Hamilton County, Tennessee		Block Group 1, Census Tract 4, Hamilton County, Tennessee		Block Group 2, Census Tract 4, Hamilton County, Tennessee	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	351,305	*****	1,564	+/-354	2,317	+/-680
Not Hispanic or Latino:	333,492	*****	1,552	+/-356	2,317	+/-680
White alone	251,303	+/-124	128	+/-74	427	+/-474
Black or African American alone	68,661	+/-537	1,346	+/-327	1,862	+/-484
American Indian and Alaska Native alone	439	+/-155	0	+/-12	0	+/-12
Asian alone	6,778	+/-335	50	+/-88	0	+/-12
Native Hawaiian and Other Pacific Islander alone	103	+/-68	0	+/-12	0	+/-12
Some other race alone	237	+/-107	0	+/-12	0	+/-12
Two or more races:	5,971	+/-693	28	+/-42	28	+/-46
Two races including Some other race	171	+/-106	0	+/-12	0	+/-12
Two races excluding Some other race, and three or more races	5,800	+/-671	28	+/-42	28	+/-46
Hispanic or Latino:	17,813	*****	12	+/-26	0	+/-12
White alone	13,397	+/-802	12	+/-26	0	+/-12
Black or African American alone	857	+/-418	0	+/-12	0	+/-12
American Indian and Alaska Native alone	12	+/-18	0	+/-12	0	+/-12
Asian alone	147	+/-85	0	+/-12	0	+/-12
Native Hawaiian and Other Pacific Islander alone	31	+/-50	0	+/-12	0	+/-12
Some other race alone	2,635	+/-571	0	+/-12	0	+/-12

	Block Group 1, Census Tract 28, Hamilton County, Tennessee		Block Group 2, Census Tract 28, Hamilton County, Tennessee		Block Group 3, Census Tract 28, Hamilton County, Tennessee	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	1,128	+/-196	834	+/-173	1,541	+/-275
Not Hispanic or Latino:	1,072	+/-177	807	+/-167	1,541	+/-275
White alone	946	+/-182	595	+/-145	1,094	+/-252
Black or African American alone	69	+/-69	212	+/-130	447	+/-169
American Indian and Alaska Native alone	21	+/-24	0	+/-12	0	+/-12
Asian alone	24	+/-26	0	+/-12	0	+/-12
Native Hawaiian and Other Pacific Islander alone	0	+/-12	0	+/-12	0	+/-12
Some other race alone	0	+/-12	0	+/-12	0	+/-12
Two or more races:	12	+/-20	0	+/-12	0	+/-12
Two races including Some other race	0	+/-12	0	+/-12	0	+/-12
Two races excluding Some other race, and three or more races	12	+/-20	0	+/-12	0	+/-12
Hispanic or Latino:	56	+/-70	27	+/-30	0	+/-12
White alone	56	+/-70	11	+/-17	0	+/-12
Black or African American alone	0	+/-12	16	+/-25	0	+/-12
American Indian and Alaska Native alone	0	+/-12	0	+/-12	0	+/-12
Asian alone	0	+/-12	0	+/-12	0	+/-12
Native Hawaiian and Other Pacific Islander alone	0	+/-12	0	+/-12	0	+/-12
Some other race alone	0	+/-12	0	+/-12	0	+/-12
Two or more races:	0	+/-12	0	+/-12	0	+/-12
Two races including Some other race	0	+/-12	0	+/-12	0	+/-12
Two races excluding Some other race, and three or more races	0	+/-12	0	+/-12	0	+/-12

	Block Group 6, Census Tract 116, Hamilton County, Tennessee		Block Group 1, Census Tract 117, Hamilton County, Tennessee		Block Group 2, Census Tract 117, Hamilton County, Tennessee	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	1,208	+/-270	1,743	+/-491	1,065	+/-528
Not Hispanic or Latino:	1,166	+/-279	1,345	+/-402	676	+/-243
White alone	1,020	+/-303	1,181	+/-346	663	+/-247
Black or African American alone	33	+/-32	49	+/-68	0	+/-12
American Indian and Alaska Native alone	0	+/-12	0	+/-12	0	+/-12
Asian alone	113	+/-165	38	+/-56	0	+/-12
Native Hawaiian and Other Pacific Islander alone	0	+/-12	0	+/-12	0	+/-12
Some other race alone	0	+/-12	0	+/-12	0	+/-12
Two or more races:	0	+/-12	77	+/-114	13	+/-24
Two races including Some other race	0	+/-12	0	+/-12	13	+/-24
Two races excluding Some other race, and three or more races	0	+/-12	77	+/-114	0	+/-12
Hispanic or Latino:	42	+/-65	398	+/-370	389	+/-562
White alone	0	+/-12	1	+/-4	385	+/-558
Black or African American alone	42	+/-65	201	+/-308	0	+/-12
American Indian and Alaska Native alone	0	+/-12	0	+/-12	0	+/-12
Asian alone	0	+/-12	0	+/-12	0	+/-12
Native Hawaiian and Other Pacific Islander alone	0	+/-12	0	+/-12	0	+/-12
Some other race alone	0	+/-12	113	+/-190	4	+/-9
Two or more races:	0	+/-12	83	+/-131	0	+/-12
Two races including Some other race	0	+/-12	83	+/-131	0	+/-12
Two races excluding Some other race, and three or more races	0	+/-12	0	+/-12	0	+/-12

	Block Group 3, Census Tract 117, Hamilton County, Tennessee		Block Group 4, Census Tract 117, Hamilton County, Tennessee		Block Group 1, Census Tract 118, Hamilton County, Tennessee	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	1,034	+/-277	1,122	+/-391	1,829	+/-513
Not Hispanic or Latino:	1,034	+/-277	894	+/-221	1,309	+/-463
White alone	844	+/-271	816	+/-229	989	+/-331
Black or African American alone	170	+/-123	78	+/-121	311	+/-335
American Indian and Alaska Native alone	0	+/-12	0	+/-12	0	+/-12
Asian alone	0	+/-12	0	+/-12	0	+/-12
Native Hawaiian and Other Pacific Islander alone	0	+/-12	0	+/-12	0	+/-12
Some other race alone	0	+/-12	0	+/-12	0	+/-12
Two or more races:	20	+/-29	0	+/-12	9	+/-23
Two races including Some other race	0	+/-12	0	+/-12	0	+/-12
Two races excluding Some other race, and three or more races	20	+/-29	0	+/-12	9	+/-23
Hispanic or Latino:	0	+/-12	228	+/-337	520	+/-325
White alone	0	+/-12	228	+/-337	24	+/-44
Black or African American alone	0	+/-12	0	+/-12	0	+/-12
American Indian and Alaska Native alone	0	+/-12	0	+/-12	0	+/-12
Asian alone	0	+/-12	0	+/-12	0	+/-12
Native Hawaiian and Other Pacific Islander alone	0	+/-12	0	+/-12	0	+/-12
Some other race alone	0	+/-12	0	+/-12	496	+/-320
Two or more races:	0	+/-12	0	+/-12	0	+/-12
Two races including Some other race	0	+/-12	0	+/-12	0	+/-12
Two races excluding Some other race, and three or more races	0	+/-12	0	+/-12	0	+/-12

	Block Group 5, Census Tract 118, Hamilton County, Tennessee		Block Group 6, Census Tract 118, Hamilton County, Tennessee		Block Group 1, Census Tract 119, Hamilton County, Tennessee	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	1,599	+/-372	762	+/-230	807	+/-201
Not Hispanic or Latino:	1,342	+/-387	762	+/-230	754	+/-216
White alone	937	+/-256	722	+/-227	547	+/-202
Black or African American alone	370	+/-400	40	+/-71	189	+/-96
American Indian and Alaska Native alone	0	+/-12	0	+/-12	0	+/-12
Asian alone	35	+/-53	0	+/-12	0	+/-12
Native Hawaiian and Other Pacific Islander alone	0	+/-12	0	+/-12	0	+/-12
Some other race alone	0	+/-12	0	+/-12	0	+/-12
Two or more races:	0	+/-12	0	+/-12	18	+/-26
Two races including Some other race	0	+/-12	0	+/-12	18	+/-26
Two races excluding Some other race, and three or more races	0	+/-12	0	+/-12	0	+/-12
Hispanic or Latino:	257	+/-282	0	+/-12	53	+/-48
White alone	257	+/-282	0	+/-12	48	+/-48
Black or African American alone	0	+/-12	0	+/-12	0	+/-12
American Indian and Alaska Native alone	0	+/-12	0	+/-12	0	+/-12
Asian alone	0	+/-12	0	+/-12	0	+/-12
Native Hawaiian and Other Pacific Islander alone	0	+/-12	0	+/-12	0	+/-12
Some other race alone	0	+/-12	0	+/-12	5	+/-7
Two or more races:	0	+/-12	0	+/-12	0	+/-12
Two races including Some other race	0	+/-12	0	+/-12	0	+/-12
Two races excluding Some other race, and three or more races	0	+/-12	0	+/-12	0	+/-12

Hazardous Materials

Environmental Study

Technical Section

Section: Hazardous Materials

Study Results

Based on the Functional Plan figure dated 15 March 2018, no known hazardous materials sites appear to affect this project as it is currently planned and no additional hazardous material studies are recommended at this time. The asbestos bridge surveys have been completed and no asbestos was detected.

In the event hazardous substances/wastes are encountered within the right-of-way, their disposition shall be subject to all applicable regulations, including the applicable sections of the Federal Resource Conservation and Recovery Act, as amended; and the Comprehensive Environmental Response, Compensation, and Liability Act, as amended; and the Tennessee Hazardous Waste Management Act of 1983, as amended. Databases reviewed include: Google Earth imagery, EPA National Priorities List, EPA EnviroMapper, TDEC Registered UST database, TDEC Division of Water Resources Public Data Viewer, TDOT IBIS, and others as necessary.

Commitments

Did the study of this project result in any environmental commitments?

No

Additional Information

Is there any additional information or material included with this study?

No

Certification

Responder: Kyle Kirschenmann

Signature:

Kyle Kirschenmann

Title: Environmental Program Manager, Hazardous Materials Section

Digitally signed by Kyle Kirschenmann
DN: cn=Kyle Kirschenmann, o=TDOT,
ou=Environmental Division,
email=kyle.kirschenmann@tn.gov,
c=US
Date: 2018.03.16 11:35:20 -04'00'

Multimodal

Environmental Study

Technical Section

Section: Multimodal

Study Results

This project is exempt from multimodal accommodations. It is a bridge replacement project for a facility where such users are prohibited.

Commitments

Did the study of this project result in any environmental commitments?

No

Additional Information

Is there any additional information or material included with this study?

No

Certification

Responder: Byron Head

Title: Transportation Program Monitor

Signature:

Byron Head
2018.03.20
11:48:57 -05'00'

Kimberly Vasut-Shelby

From: Byron C. Head
Sent: Friday, August 24, 2018 10:50 AM
To: Kimberly Vasut-Shelby
Subject: RE: Hamilton, 124069.00, Bridge Replacement over Germantown Road and Belvoir Ave: ESR

Hi Kim,

The portion of the project on the Belvoir Ave bridge accommodates pedestrians with 6' sidewalks on both sides of the roadway. Do you need me to fill out another ESR?



Byron Head | Transportation Program Monitor
Multimodal Transportation Resources Division
James K. Polk Bldg., 12th Floor
505 Deaderick St., Nashville, TN 37243
p. 615-837-5463
byron.c.head@tn.gov
tn.gov/tdot

From: Kimberly Vasut-Shelby
Sent: Thursday, August 23, 2018 9:39 AM
To: Byron C. Head
Subject: RE: Hamilton, 124069.00, Bridge Replacement over Germantown Road and Belvoir Ave: ESR

Byron,

I had a very quick follow up question for this project. In your ESR, you reference that multimodal is not needed due to the bridge being on I-24. There is no response concerning the Belvoir bridge. I have attached the TIR that shows the plans for the layout of this bridge. They are including 6-foot sidewalks on both sides of the bridge.

Please let me know if you need anything else.

Kim



Kimberly Vasut-Shelby | Environmental Studies Specialist Advanced
Environmental Division | Environmental Analysis Office, NEPA Section
James K. Polk Building, 9th Floor
505 Deadrack St, Suite 900, Nashville, TN 37243
Work: (615) 313-3764
Email: Kimberly.Vasut-Shelby@tn.gov

Quality Assurance Review

Project Information

Route: I-24
Termini: Bridges at Germantown Road, LM 12.08 and Belvoir Avenue, 12.59 in East Ridge.
County: Hamilton
PIN: 124069.00
Preparer: Kimberly Vasut-Shelby

Certification

By signing below, you certify that this document has been reviewed for compliance with all applicable environmental laws, regulations and procedures. The document has been evaluated for quality, accuracy, and completeness, and that all source material has been verified, compiled and included in the attachments and technical appendices.

Reviewer:	Erick Hunt-Hawkins	Signature:	Erick K. Hunt-Hawkins <small>Digitally signed by Erick K. Hunt-Hawkins DN: cn=Erick K. Hunt-Hawkins, o=TDOT, ou=Environmental Division, email=Erick.Hunt-Hawkins@tn.gov, c=US Date: 2018.10.18 13:31:34 -0500</small>
Title:	Environmental Supervisor	Comment:	Comments made.

Reviewer:	Erick Hunt-Hawkins	Signature:	Erick K. Hunt-Hawkins <small>Digitally signed by Erick K. Hunt-Hawkins DN: cn=Erick K. Hunt-Hawkins, o=TDOT, ou=Environmental Division, email=Erick.Hunt-Hawkins@tn.gov, c=US Date: 2018.10.19 08:35:02 -0500</small>
Title:	Environmental Supervisor	Comment:	Comments addressed.

Reviewer:	Enter Reviewer Name	Signature:	
Title:	Enter Reviewer Title	Comment:	Enter Comment

Reviewer:	Enter Reviewer Name	Signature:	
Title:	Enter Reviewer Title	Comment:	Enter Comment

Reviewer:	Enter Reviewer Name	Signature:	
Title:	Enter Reviewer Title	Comment:	Enter Comment