TENNESSEE
DEPARTMENT OF TRANSPORTATION

TRANSPORTATION INVESTMENT REPORT
IMPROVE Act

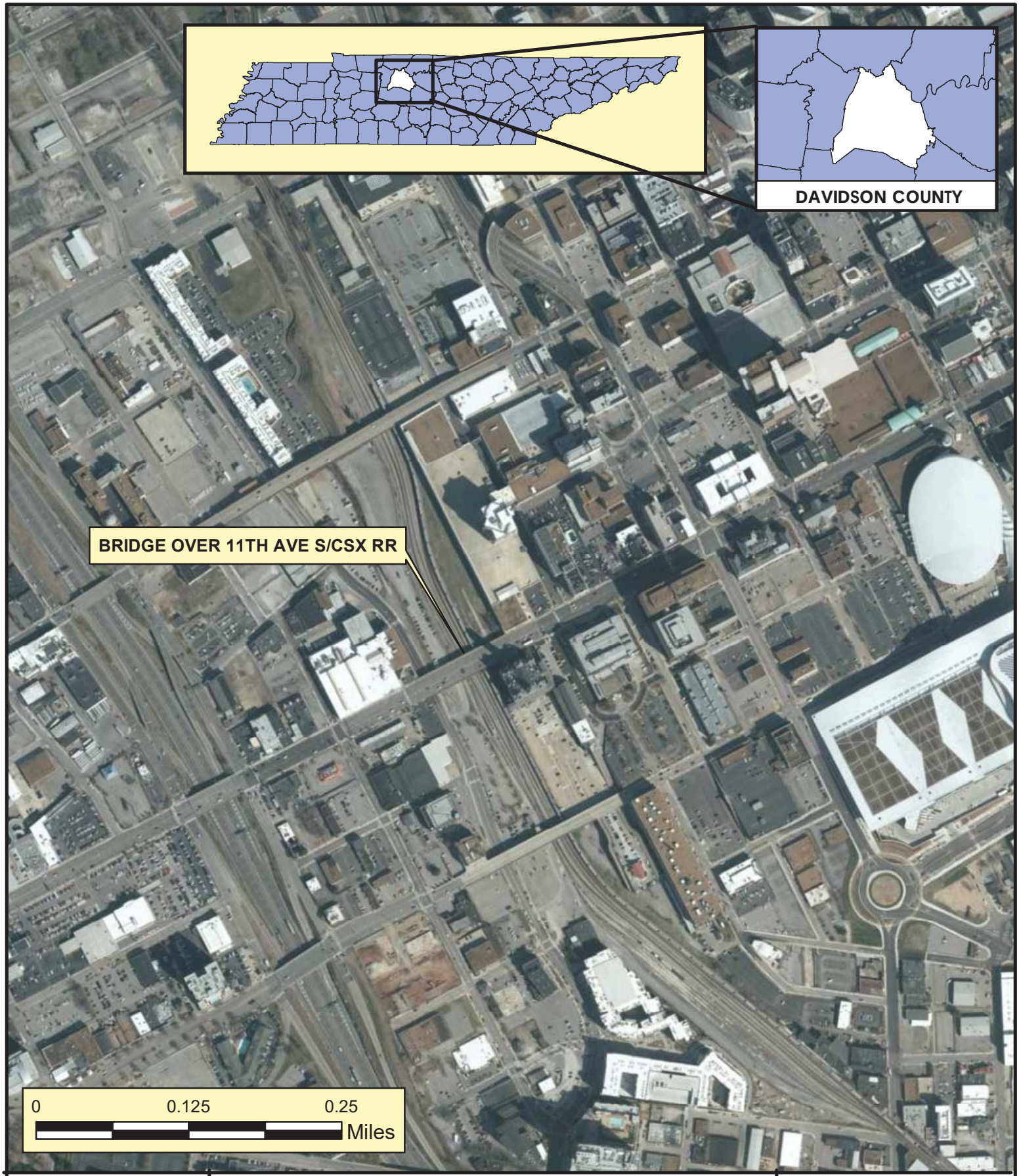
State Route 1 (US-431/70)
Bridge 19SR0010019 over 11th Avenue South and CSX RR (Log Mile 17.29)
Nashville, Davidson County
PIN 124238.00

Prepared by WSP USA for the
TENNESSEE DEPARTMENT OF TRANSPORTATION
Strategic Transportation Investments Division

Approved by: PRESTON J ELLIOTT Digitally signed by PRESTON J ELLIOTT Date: 2020.12.09 14:56:42 -06'00' ***Date:*** _____
Chief of Environment and Planning

Approved by: Paul D. Degges, P.E. Digitally signed by Paul D. Degges, P.E. Date: 2020.12.09 14:31:06 -06'00' ***Date:*** _____
Deputy Commissioner and Chief Engineer

Approved by	Signature	Date
TRANSPORTATION DIRECTOR STRATEGIC TRANSPORTATION INVESTMENTS DIVISION		11/5/2020
ENGINEERING DIRECTOR REGION 3 PROJ. DEVELOPMENT		11/6/2020
ENGINEERING DIRECTOR STRUCTURES DIVISION		11/06/2020



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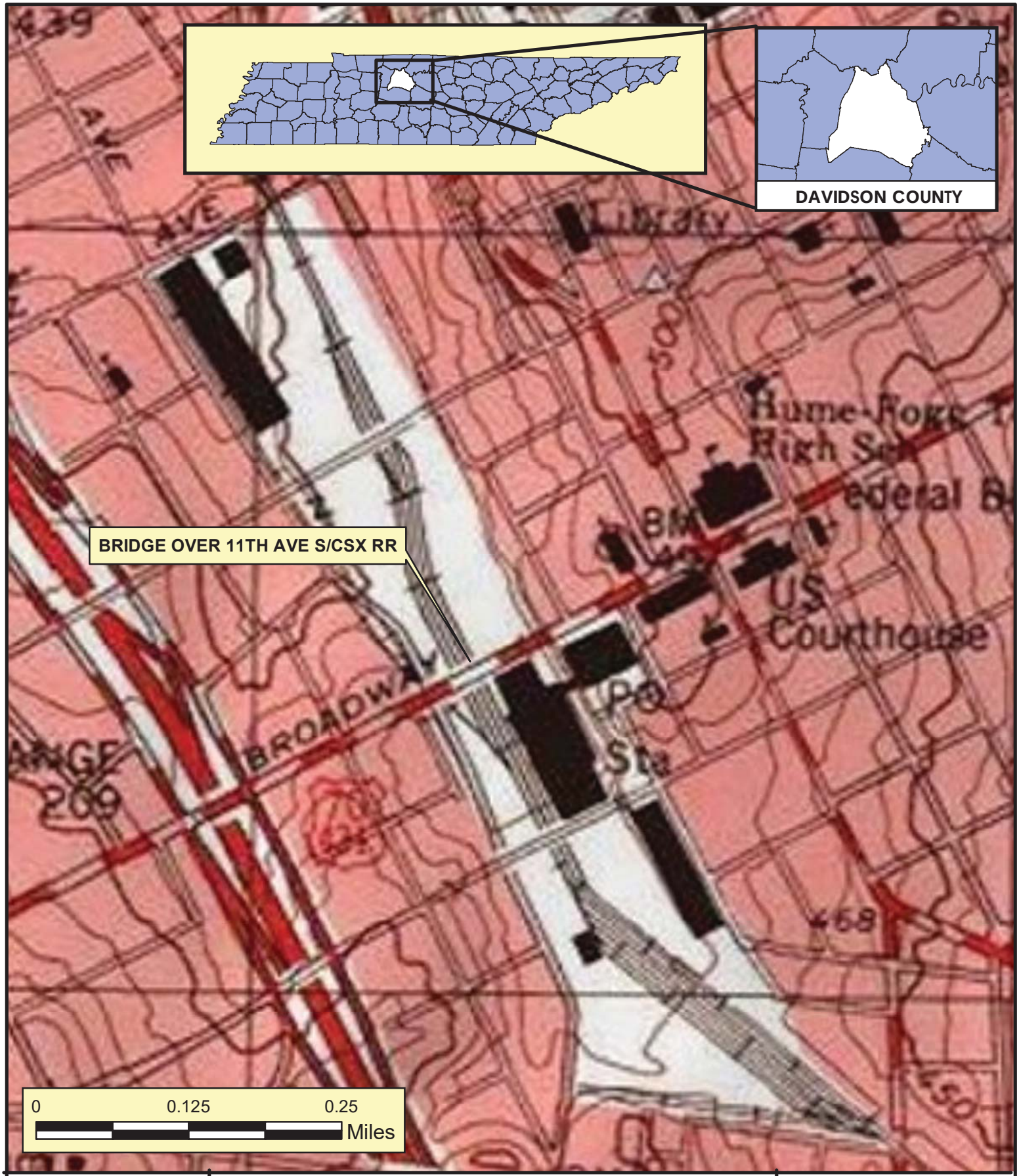
AERIAL MAP
BRIDGE TIR
STATE ROUTE 1
BRIDGE (19SR0010019) OVER
11TH AVE S/CSX RR (LM 17.29)
DAVIDSON COUNTY

TN TDOT Department of Transportation



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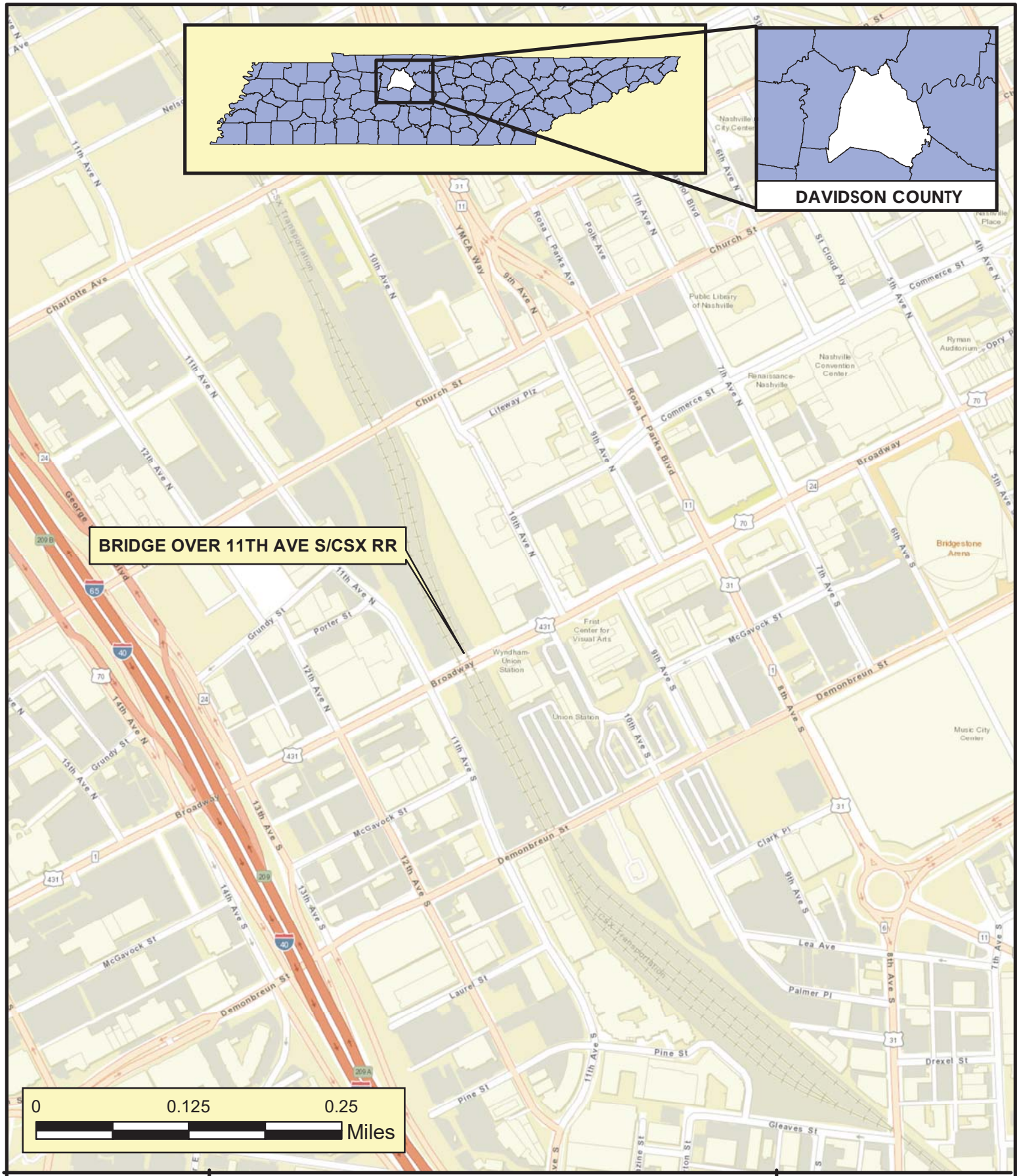
TOPOGRAPHIC MAP
BRIDGE TIR
STATE ROUTE 1
BRIDGE (19SR0010019) OVER
11TH AVE S/CSX RR (LM 17.29)
DAVIDSON COUNTY

TN TDOT Department of Transportation



LOCATION MAP
BRIDGE TIR
STATE ROUTE 1
BRIDGE (19SR0010019) OVER
11TH AVE S/CSX RR (LM 17.29)
DAVIDSON COUNTY

TN TDOT Department of Transportation

Bridge Transportation Investment Report – IMPROVE Act

Summary of Improvements
PIN 124238.00
Davidson County
State Routes 1/24 (U.S. Routes 70/70S/431 Broadway) – Bridge over CSX RR & 11th Ave (LM 17.29)
Bridge ID: 19SR0010019

EXISTING STRUCTURE:

A field review was held for the above project on August 9, 2018. The existing structure, built in 1948, is an eighteen (18) span I-beam bridge crossing 11th Avenue and the CSX Railroad in the area known as the Gulch in Nashville (Davidson County). The structure has an out-to-out width of approximately ninety-eight (98) feet and an overall length of approximately six hundred and ninety-seven (697) feet. The clearance above 11th Avenue varies between twenty (20) feet one (1) inch and twenty (20) feet seven (7) inches. The clearance above the railroad tracks looking North from West to East is as follows: twenty (20) feet ten (10) inches, twenty-one (21) feet three (3) inches, twenty (20) feet seven (7) inches, twenty (20) feet one (1) inch, and nineteen (19) feet six (6) inches. The sufficiency rating for this structure is 53.0 based on the Bridge Inspection Report from February 26, 2019. The existing structure and roadway approaches have one (1) twelve (12) foot two-way left turn lane(s) and six (6) ten (10) foot travel lane(s). On both sides of the roadway the one-foot (1) gutter pan has been paved over to create one-foot (shoulder) and a half-foot (.5) vertical curb is adjacent to that. There are ten (10) foot sidewalks on back of curb on both sides of the roadway. The current weight limit is twenty (20) tons.

FEATURE CROSSED:

The study area is not in proximity to floodplains or streams. The bridge crosses over 11th Ave, five (5) lines of CSX Railroad, two (2) green-way paths, and a future urban pocket park currently under development.

TRAFFIC AND TYPICAL SECTION:

The route has a base year 2023 Average Annual Daily Traffic (AADT) of 29,530 vehicles per day and a design year 2043 AADT of 41,760 vehicles per day. The route has a speed limit of thirty (30) mph and a design speed of thirty (30) mph was assumed for this project. The route is classified as an urban principal arterial and Standard Drawing RD11-TS-6A was used for design considerations. This typical section was modified due to site constraints and will have one (1) twelve-foot (12) two-way left turn lane(s), six (6) ten-foot (10) travel lane(s), one-and-a-half foot (1.5) curb and gutter, one (1) ten-foot (10) sidewalk on the southside, and one (1) four-foot (4) furnishing zone with a ten-foot (10) sidewalk for a total pedestrian width of fourteen-feet (14) which meets METRO Nashville pedestrian standards. The proposed connection with the Nashville Yards pedestrian bridge is included on the northside of the roadway.

PROPOSED IMPROVEMENTS AND MAINTENANCE OF TRAFFIC:

The proposed bridge is to be a nine (9) span, concrete prestressed box beam bridge with a beam depth of thirty-six (36) inches and full depth pre-cast deck panels. The bents adjacent to the railroad shall incorporate crash walls. The max span length is eighty-eight (88) feet five (5) inches. Horizontally the bridge and approaches will remain on existing alignment. Vertically the proposed bridge will feature three vertical curves in order to increase the vertical clearance above the CSX railroad tracks and to tie back to existing grade before impacting historic Union Station or the proposed developments on the other three corners of the bridge and the approaches. It is anticipated that 11th avenue will undergo a

complete street renovation. The proposed typical section for 11th Avenue shall be coordinated with Metro Public Works as design progresses to ensure that minimum clearances are met. The bridge will have an out-to-out width of one hundred and one feet (101) six (6) inches. The total length will equal that of the existing bridge and be plus or minus six hundred and ninety-seven (697±) feet depending on how the abutments are treated. With this design and dimensions the vertical clearance above the railroad tracks looking North from West to East is as follows: twenty-three (23) feet zero (0) inches, twenty-three (23) feet zero (0) inches, twenty-two (22) feet six (6) inches, twenty-two (22) feet zero (0) inches, and twenty (20) feet six (6) inches. It is anticipated this project will require alternative delivery methods for construction due to the proximity of developments and historic sites on all four corners of the bridge and approaches, to five (5) active CSX rail lines, and to the importance of Broadway to traffic flow in and out of downtown Nashville. The final decision to use and the best method of alternative delivery has not been determined at this time.

Maintenance of traffic will depend on the project delivery method chosen. It is anticipated that Demonbreun St., Church St., and Charlotte Ave. will all be evaluated as viable detour routes and access routes to downtown. These are referred to as Alternative Routes A, B, and C on the alternate route map contained in this report. Exact routes for the maintenance of traffic plan will need to be coordinated with Metro Nashville Public Works taking into consideration building construction along the routes and other required lane closures once the exact construction timeframe has been identified.

COST ESTIMATE:

The cost for the estimated construction, Right-of-Way, and preliminary engineering for this bridge replacement is approximately $51,500,000. Approximately 0.02 acres are expected to be acquired for this project. It is expected to impact about a tenth of a mile of power, water, and communication utilities, however this could change based on the survey that is conducted during the design phase. Below is the cost estimate breakdown along with a five (5) year inflated cost estimate based on 5% per year:

COST ESTIMATE SUMMARY (2020)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2020):
124238.00	Bridge Replacement	$ 2,860,000	$ 250,000	$ 5,000,000	$ 43,400,000	$ 51,500,000

INFLATED COST ESTIMATE SUMMARY					Report Type:	Bridge Replacement
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost
5	2025	$ 3,650,000	$ 319,000	$ 6,380,000	$ 55,400,000	$ 65,700,000

TYPE	YEAR	COUNTY	FIGURE NO.
T.I.R	2020	DAVIDSON	1

HEAVY CONSTRUCTION PIER

NASHVILLE YARDS
PEDESTRIAN BRIDGE
CONNECTION
WIDTH: 22'

NO BRDIGE RAIL ALONG
THE GRAND HYATT

10' SIDEWALK
4' FURNISHING ZONE

10' SIDEWALK
4' FURNISHING ZONE

11TH AVENUE NORTH

CSX RAILROAD (5) FIVE TRACKS

BEGIN PROJECT

PROP. R.O.W.

55'-0" 55'-0" 80'-0" 80'-0" 78'-6" 85'-0" 85'-0" 85'-0" 88'-5"

END PROJECT

STATE ROUTE 1 (BROADWAY)

STATE ROUTE 1 (BROADWAY)

PROP. REINFORCED CONCRETE
PAVEMENT AT BRIDGE ENDS

11TH AVENUE SOUTH

HISTORIC
UNION STATION

PROPOSED ROADWAY
(6) 10' TRAVEL LANES
(1) TWO-WAY LEFT TURN LANE
1.5' CURB & GUTTER

10' SIDEWALK

NO BRIDGE RAIL ALONG
HISTORIC UNION STATION

CSX RAILROAD

TOTAL BRIDGE LENGTH: 697'-0"±
OUT-TO-OUT WIDTH: 101'-6"
(9) NINE SPANS
PRESTRESSED BOX BEAM
BEAM DEPTH: 36"
ABUTMENT ASSUMED WIDTH: 2.5'

0 100' 200' 300'

N

PROPOSED LAYOUT

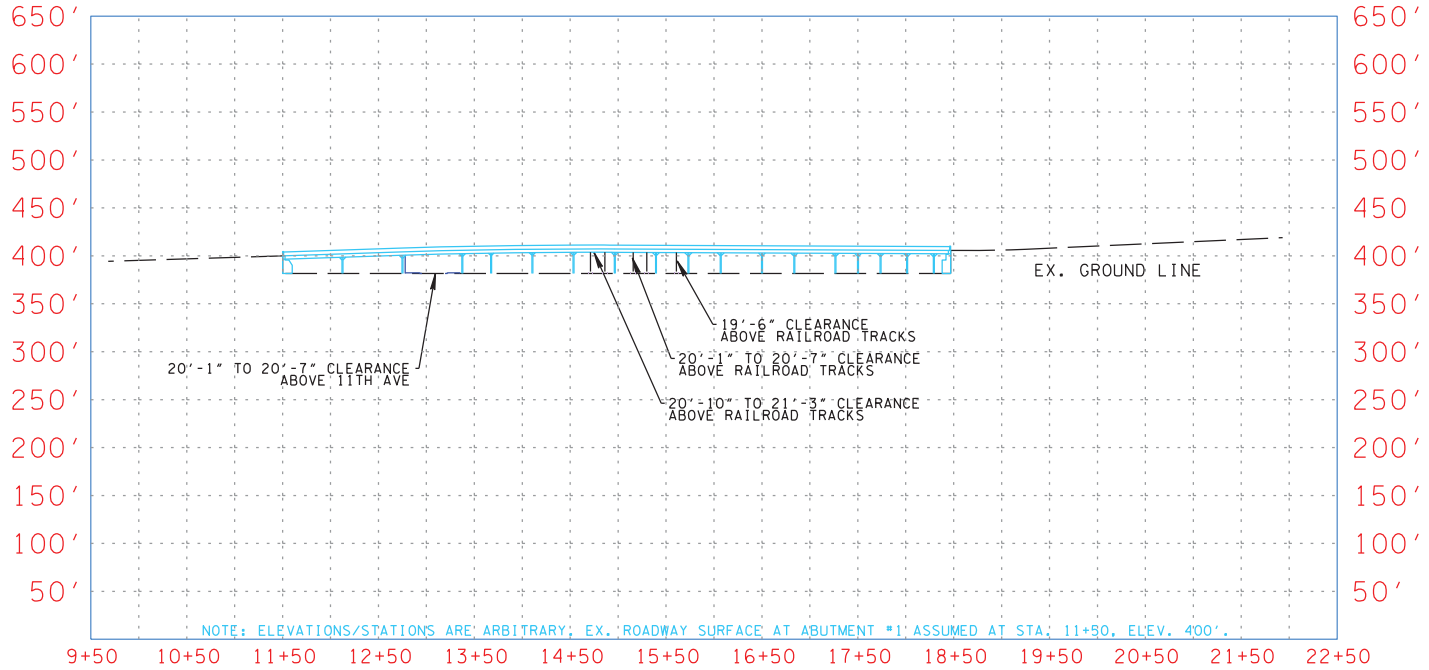
STATE ROUTE 1
BRIDGE 19SR0010019 OVER 11TH AVENUE SOUTH AND CSX RR (L.M. 17.29)
DAVIDSON COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
S.T.I.D.

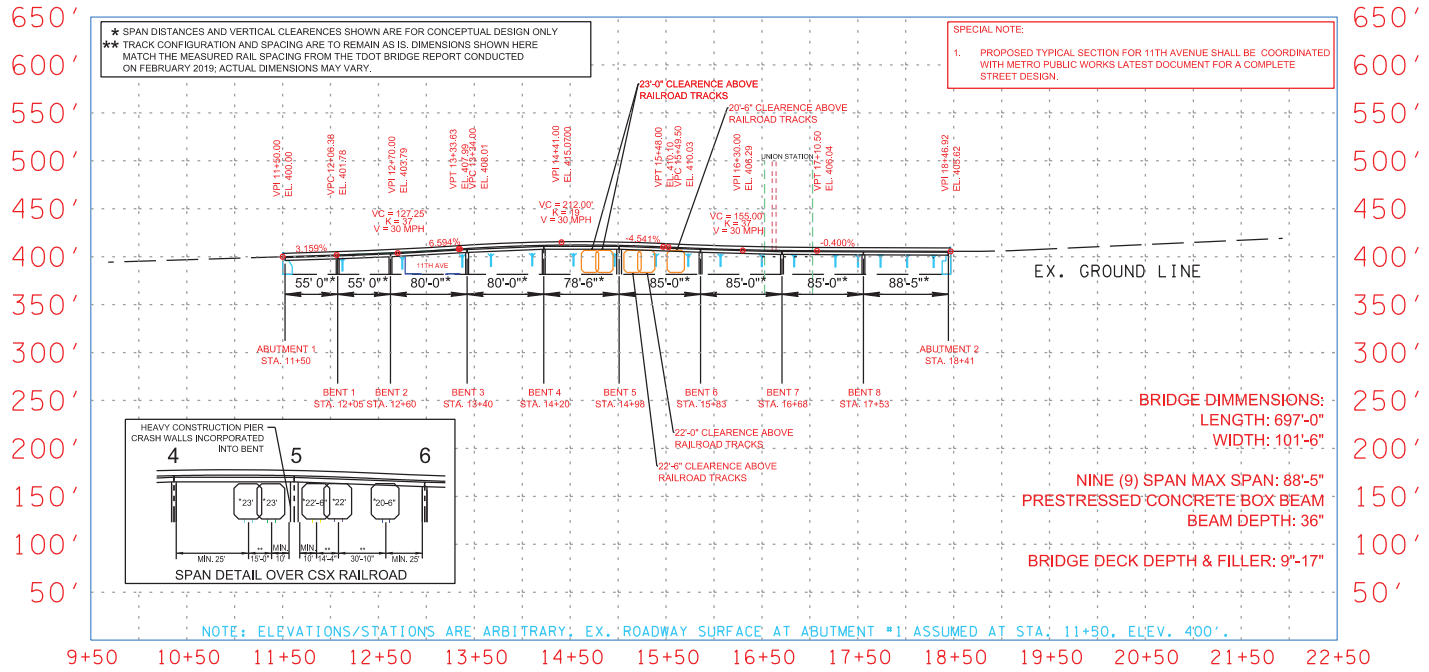
FIGURE 1
STATE ROUTE 1
L.M. 17.29

11/5/2020 9:52:46 AM
T:\PRJ\188689 TDOT STID On-Call\014 SR 1 Bridge TIR\124238-00-Proposed.dgn

EXISTING BRIDGE
PROFILE (LOOKING NORTH)



PROPOSED BRIDGE
PROFILE (LOOKING NORTH)

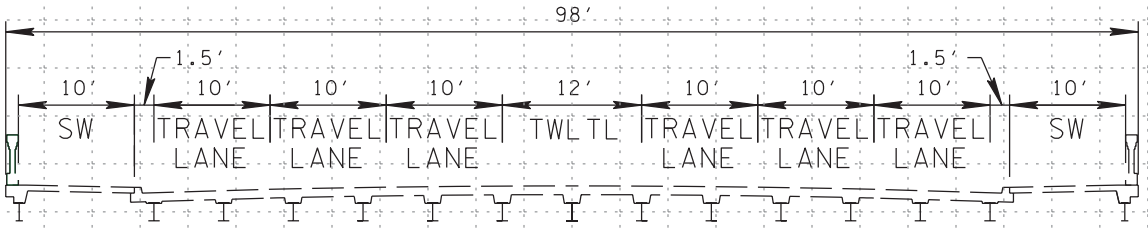


0 100′ 200′ 300′

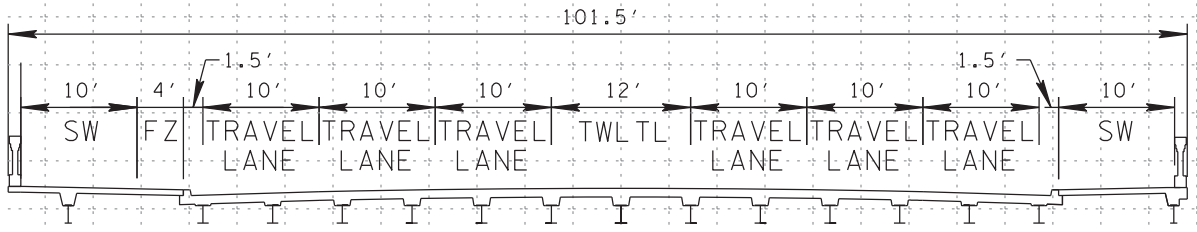
BRIDGE PROFILE

STATE ROUTE 1
BRIDGE 19SR0010019 OVER 11TH AVE S/CSX RR (L.M. 17.29)
DAVIDSON COUNTY

EXISTING



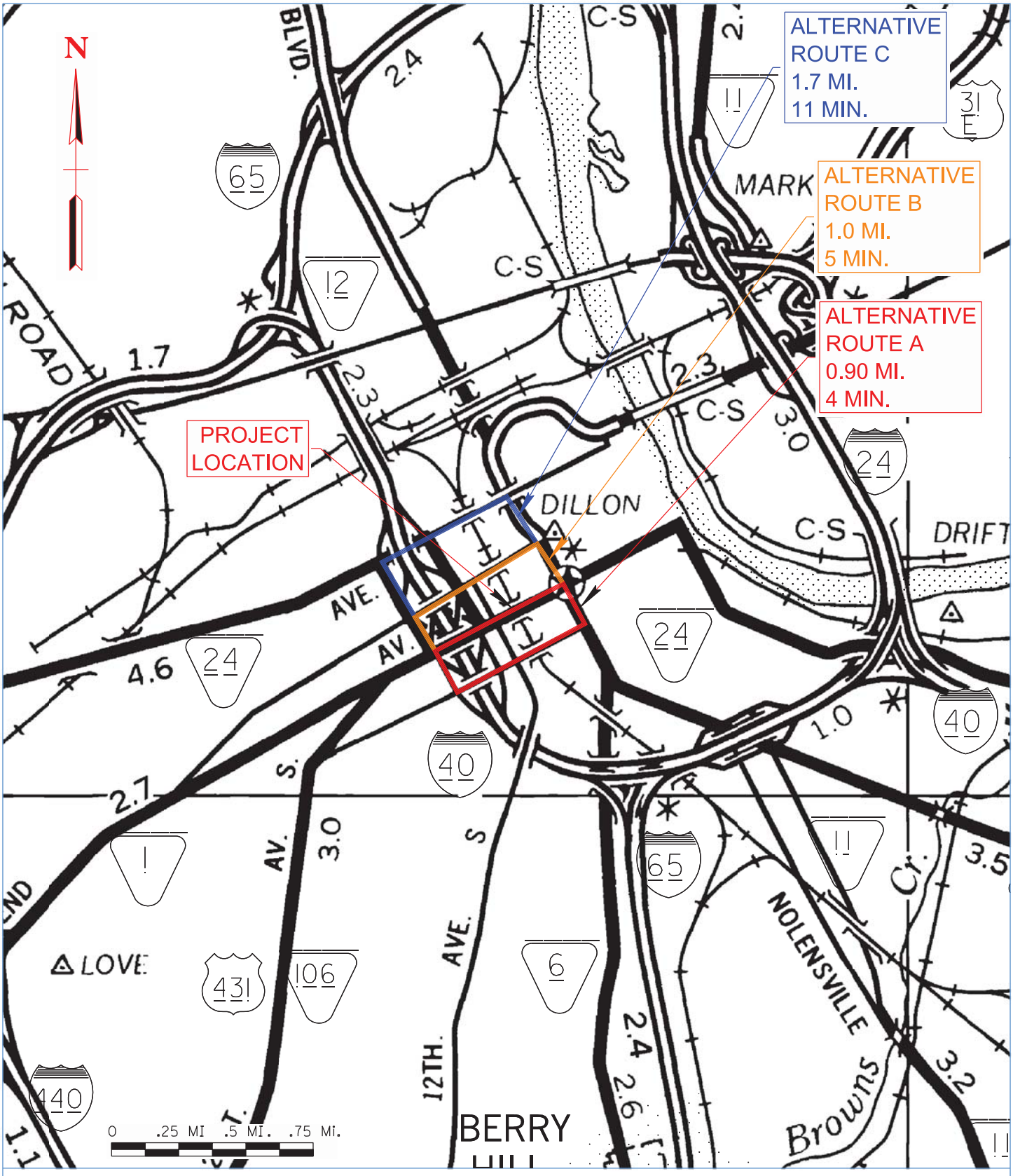
PROPOSED



NOTE:
ALTERNATE PROJECT DELIVERY METHODS ARE ANTICIPATED

BRIDGE TYPICAL SECTION

STATE ROUTE 1
BRIDGE 19SR0010019 OVER 11TH AVE S/CSX RR (L.M. 17.29)
NASHVILLE, DAVIDSON COUNTY



ALTERNATIVE ROUTE MAP

STATE ROUTE 1
BRIDGE 19SR0010019 OVER 11TH AVE S/CSX RR (L.M. 17.29)
DAVIDSON COUNTY

PAY ITEM SUMMARY

TDOT PAY ITEM	TDOT DESCRIPTION	UNIT	TOOL QUANTITIES	ADDITIONAL QUANTITIES	TOOL QUANTITIES + ADDITIONAL QUANTITIES	Statewide UNIT COST	TOTAL COST
							<-- Unit Cost Trends with Quantities
Pavment Removal							
202-03.01	REMOVAL OF ASPHALT PAVEMENT	SY	6101		6101	$ 33.89	$ 206,773.43
415-01.02	COLD PLANING BITUMINOUS PAVEMENT	SY	5400		5400	$ 4.20	$ 22,679.57
						PAVEMENT REMOVAL TOTAL (ROUNDED)	$ 229,500
Asphalt Roads							
303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TON	4692		4692	$ 27.47	$ 128,869.66
307-02.01	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING A	TON	974		974	$ 99.41	$ 96,780.01
307-01.21	AGGREGATE (BPMB-HM) GRADING A-S MIX	TON	762		762	$ 97.57	$ 74,338.97
307-02.08	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING B-M2	TON	638		638	$ 115.64	$ 73,749.89
402-01	BITUMINOUS MATERIAL FOR PRIME COAT (PC)	TON	8		8	$ 570.81	$ 4,583.33
402-02	AGGREGATE FOR COVER MATERIAL (PC)	TON	28		28	$ 58.51	$ 1,651.19
403-01	BITUMINOUS MATERIAL FOR TACK COAT (TC)	TON	2		2	$ 657.80	$ 1,315.60
411-02.10	ACS MIX(PG70-22) GRADING D	TON	395		395	$ 125.08	$ 49,408.18
						PAVING TOTAL (ROUNDED)	$ 430,700
Concrete Roads							
						CONCRETE RAMPS AND ROADWAYS TOTAL (ROUNDED)	$ -
Drainage							
607-05.02	24" CONCRETE PIPE CULVERT (CLASS III)	LF	738		738	$ 75.01	$ 55,348.38
611-12.02	CATCH BASINS, TYPE 12, > 4' - 8' DEPTH	EA	3		3	$ 4,082.39	$ 11,208.62
611-14.02	CATCH BASINS, TYPE 14, > 4' - 8' DEPTH	EA	1		1	$ 6,847.88	$ 9,400.77
611-42.02	CATCH BASINS, TYPE 42, > 4' - 8' DEPTH	EA	1		1	$ 5,435.85	$ 3,391.97
710-02	Aggregate Underdrains (with pipe)	LF	686		686	$ 6.07	$ 4,166.45
						DRAINAGE TOTAL (ROUNDED)	$ 83,600
Appurtenances							
701-01.01	CONCRETE SIDEWALK (4 ")	SF	13940		13940	$ 7.97	$ 111,101.80
702-03	CONCRETE COMBINED CURB & GUTTER	CY	104		104	$ 432.38	$ 45,021.35
						ROADWAY AND PAVEMENT APPURTENANCES TOTAL (ROUNDED)	$ 156,200
Earthwork & Mineral							
105-01	CONSTRUCTION STAKES, LINES AND GRADES	LS	1		1	$ 361,402.26	$ 361,402.26
203-01	ROAD & DRAINAGE EXCAVATION (UNCLASSIFIED)	CY	748		748	$ 20.86	$ 15,595.93
203-02.01	BORROW EXCAVATION (GRADED SOLID ROCK)	TON	62		62	$ 38.06	$ 2,367.65
203-03	BORROW EXCAVATION (UNCLASSIFIED)	CY	168		168	$ 18.31	$ 3,074.47
						EARTHWORK & MINERAL TOTAL (ROUNDED)	$ 382,500
Structures							
N/A	Removal of Bridge	SF	68306		68306	$ 30.00	$ 2,049,180.00
N/A	New Bridge (Concrete Girder):	SF	70746		70746	$ 300.00	$ 21,223,650.00
604-07.01	RETAINING WALL	SF	7000		7000	$ 75.00	$ 525,000.00
						STRUCTURES TOTAL (ROUNDED)	$ 23,797,900
Interchanges and Unique Intersections							
						INTERCHANGES AND UNIQUE INTERSECTIONS TOTAL (ROUNDED)	$ -
Lighting & Signalization							
N/A	Traffic Signal	EA	0		1	$ 250,000.00	$ 250,000.00
						LIGHTING & SIGNALIZATION TOTAL (ROUNDED)	$ 250,000
Guardrail							
705-01.01	GUARDRAIL AT BRIDGE ENDS	LF	100		100	$ 66.52	$ 6,651.84

PAY ITEM SUMMARY

705-06.01	W Beam GR (Type 2) Mash TL3	LF	34		34.32	$ 20.07	$ 688.80
705-06.20	Tangent Energy Absorbing Term Mash TL-3	EA	5		5	$ 2,626.00	$ 13,130.00
705-04.09	EARTH PAD FOR TYPE 38 GR END TREATMENT	EA	5		5	$ 1,122.29	$ 5,611.45
						GUARDRAIL TOTAL (ROUNDED)	$ 26,100
Seeding and Sodding							
801-01	SEEDING (WITH MULCH)	UNIT	17		17	$ 27.26	$ 467.78
801-01.07	TEMPORARY SEEDING (WITH MULCH)	UNIT	13		13	$ 22.31	$ 287.13
801-02	SEEDING (WITHOUT MULCH)	UNIT	13		13	$ 17.70	$ 227.80
						SODDING TOTAL (ROUNDED)	$ 1,000
Maintenace of Traffic							
N/A	Traffic Control	LS	1		1		$ 500,000.00
712-02.02	INTERCONNECTED PORTABLE BARRIER RAIL	LF	1500		1500	$ 30.18	$ 45,270.00
705-08.51	PORTABLE IMPACT ATTENUATOR NCHRP350 TL-3	EA	4			$ 5,109.09	$ 20,436.36
	RAILROAD CORRIDINATION / FLAGGERS	LS	1			$ 5,000,000.00	$ 5,000,000.00
						MAINTENANCE OF TRAFFIC TOTAL (ROUNDED)	$ 5,565,800
Signs							
Not Listed	Signs (Construction)	LS	1		1	$ -	$ 25,400
						SIGNING TOTAL (ROUNDED)	$ 25,400
Pavement Markings							
716-13.06	Spray Thermo P.M. (40 mil 4")	LM	1.0		1.0	$ 1,654.23	$ 1,654.23
						PAVEMENT MARKINGS TOTAL (ROUNDED)	$ 26,600
Fencing							
707-08.01	High Visibility Construction Fence	LF		3000	3000	$ 1.67	$ 5,010.00
						FENCE TOTAL (ROUNDED)	$ 5,100.00
Rip-Rap							
709-05.05	Machined Rip-Rap (Class A-3)	TON	800		800	$ 39.85	$ 31,880.00
						RIP-RAP & SLOPE PROTECTION TOTAL (ROUNDED)	$ 31,900.00
Clearing and Grubing							
						CLEAR AND GRUBBING TOTAL (ROUNDED)	$ -
Railroad At-Grade Crossing							
						RAILROAD CROSSING OR SEPARATION TOTAL (ROUNDED)	$ -
Utilties							
N/A	Underground Power	LM	0.15		0.15	$ 500,000	$ 2,000,000
N/A	Underground Communication	LM	0.15		0.15	$ 500,000	$ 2,000,000
N/A	Underground Water	LM	0.15		0.15	$ 237,600	$ 1,000,000
						UTILITIES TOTAL (ROUNDED)	$ 5,000,000.00
Right-of-Way							
N/A	Right-of-Way	LS	1		1	$ 250,000.00	$ 250,000.00
						RIGHT-OF-WAY TOTAL (ROUNDED)	$ 250,000.00

COST ESTIMATE SUMMARY

Route:	State Route 1 (US Routes 70/70S/431, Broadway)
Description:	Bridge 19SR0010019 over 11th Avenue and CSX Railroad
	LM 17.29
Project Type of Work:	Bridge Replacement
County:	Davidson
Length:	0.13 Miles
Date:	October 26, 2020
Estimate Type:	Concept

DESCRIPTION		LOCAL	STATE	FEDERAL	TOTAL
		0%	0%	0%	
Construction Items					
Removal Items		$0	$0	$0	$230,000
Asphalt Paving		$0	$0	$0	$431,000
Concrete Pavement		$0	$0	$0	$0
Drainage		$0	$0	$0	$83,600
Appurtenances		$0	$0	$0	$156,000
Structures		$0	$0	$0	$23,800,000
Fencing		$0	$0	$0	$5,100
Signalization & Lighting		$0	$0	$0	$250,000
Railroad Crossing		$0	$0	$0	$0
Earthwork		$0	$0	$0	$383,000
Clearing and Grubbing		$0	$0	$0	$0
Seeding & Sodding		$0	$0	$0	$1,000
Rip-Rap or Slope Protection		$0	$0	$0	$31,900
Guardrail		$0	$0	$0	$26,100
Signing		$0	$0	$0	$25,400
Pavement Markings		$0	$0	$0	$26,600
Maintenance of Traffic		$0	$0	$0	$5,570,000
Mobilization	5%	$0	$0	$0	$1,550,000
Other Items	10%	$0	$0	$0	$3,260,000
Const. Contingency	30%	$0	$0	$0	$3,610,000
Const. Eng. & Inspec.	10%	$0	$0	$0	$3,940,000
Construction Estimate		$0	$0	$0	$43,400,000
Interchanges & Unique Intersections					
Roundabouts		$0	$0	$0	$0
Interchanges		$0	$0	$0	$0
Right-of-Way & Utilties		**LOCAL**	**STATE**	**FEDERAL**	**TOTAL**
		0%	0%	0%	
Right-of-Way		$0	$0	$0	$250,000
Utilities		$0	$0	$0	$5,000,000
Preliminary & Construction Engineering and Inspection					
Prelim. Eng.	7%	$0	$0	$0	$2,860,000
Total Project Cost (2020)		$0	$0	$0	$ 51,500,000

COST ESTIMATE SUMMARY (2020)						
PIN	Project Type of Work	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Project Cost (2020):
124238.00	Bridge Replacement	$ 2,860,000	$ 250,000	$ 5,000,000	$ 43,400,000	$ 51,500,000

INFLATED COST ESTIMATE SUMMARY					Report Type:	Bridge Replacement
No. of Years	Year	Preliminary Engineering:	Right-of-Way:	Utilities:	Construction:	Total Inflated Project Cost
5	2025	$ 3,650,000	$ 319,000	$ 6,380,000	$ 55,400,000	$ 65,700,000

INFLATION INPUTS	
Inflation Rate:	5.00%

BRIDGE TIR

Davidson-Nashville
SR 1/24 (US 70/70S/431, Broadway)

LOCATION			
Bridge #:	19SR0010019	Feature Crossed:	11th Avenue South/CSX Railroad
Road Name:	State Route 1	Log mile:	17.29
Route ID:	0A966	System:	State
City:	Nashville	Functional Class:	Urban Principal Arterial
County:	Davidson	State Project Number	19019-0223-04
PIN:	124238.00		

ROADWAY		
	Existing	**Proposed (Preliminary Design Estimate)**
Design Standard		RD11-TS-6A/RD11-TS-6C
Route Characteristics		
AADT:	29530	41760
AADT Year:	2023	2043
Terrain:	rolling	rolling
No. Lanes:	7	7
Speed(Posted):	30	30
Speed (Design):		30
Approach Character.		
Lane Width (ft):	10	10 (travel) / 12 (center left turn)
Shoulder Width (ft):	1	1
ROW Width (ft):	100	102
ROW Tracts Affected		3
ROW Required (acre)		0.02
Cross Section Width (ft):	98	101.5
Approach Length (ft):		25' / 62'-9"
Alignment:		Same as Existing
Grade:		<4%
Surface Material:	Asphalt	Asphalt
Sidewalks (R/L):	Yes	Yes
App. Lower Than Structure	Yes	Yes
Utilities (list)	Water, Communication	Water, Communication
Utilities to be Relocated		Yes, from existing structure to proposed
Comments		Historic Union Station is located on the Southeast Quadrant of the bridge.

BRIDGE TIR

STRUCTURE		
	Existing	**Proposed (Preliminary Design Estimate)**
Bridge Characteristics		
Year Built	1948	
Load Limit	20 tons	
Sufficiency Rating	53.0	
Skew	90	90
Structure Type	Steel I Beam	Prestressed Box Beam
Structures in Channel	No	No
Length (ft)	697	697±
No. Spans (App./Main)	0 | 18	0 | 9
Width (curb to curb) (ft)	74	74
Width (o to o) (ft)	98	101.5
Sidewalks on Structure	Yes	Yes
Vert. Clearance (ft)	19'-6" to 21'-3"	20'-6" - 23'-0"
Superstructure Depth (in)	9	9" - 17"
Girder Depth (in)	Varies	36"
Finish Grade-Low Girder (in)	46	53"
High Water Marks	N/A	
Bridge Rail Type	Concrete	Concrete Decorative
Bridge Rail Height (ft)		2'-9"
Indication Overtopping	N/A	
Local Scour		
Obstructions		
Other Structures		
Comments		Decorative bridge rail and lighting have been requested by Metro Nashville

FLOW RATES (from USGS StreamStats Program Version 3)	
Drainage Area (sq. miles)	
10 Year Discharge Rate (Q10) cfs	
50 Year Discharge Rate (Q50) cfs	
100 Year Discharge Rate (Q100) cfs	

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

FLOODPLAIN	
Skew Same as Channel	
Symmetrical About Channel	
Approx. Floor Elevations	
Type of Vegetation in Floodplain	
Any Buildings in Floodplain	
Flood Information From Locals	
Comments	

MAINTENANCE OF TRAFFIC	
Method of Maintaining Traffic	close road
Description	***Accelerated project delivery has been identified instead of of staged construction by TDOT Structures and Construction Divisions. However the final decision and exact method has not been determined. It is anticipated that a full closure would be implemented and Demonbreun St., Church St., and Charlotte Ave will all be evaluated as viable detour routes. The exact routes will need to be coordinated with Metro Nashville Public Works once the exact construction timeframe has been identified***

SITE VISIT ATTENDEES			DATE: 8/9/2018
Name	Organization	Phone	Email
Shaun Armstrong	TDOT STID	615-253-5327	shaun.armstrong@tn.gov
Brad Abel	TDOT R3 Proj. Dev.	615-350-4216	brad.abel@tn.gov
Sharon Schutz	TDOT R3 Proj. Dev.	615-350-4208	sharon.schutz@tn.goc
Ted Kniazewycz	TDOT Structures	615-741-3351	ted.kniazewycz@tn.gov
Aaron Shealy	Civic	321-439-6568	shealya@civicinc.com
Frank Rainear	TDOT R3 Proj. Dev.	615-350-4295	frank.rainear@tn.gov
Miller Bernhardt	TDOT Construction	615-840-3954	miller.bernhardt@tn.gov
Peter Soliman	TDOT Construction	615-630-5079	peter.soliman@tn.gov
Jeff Campbell	Metro Public Works	615-862-8659	jeff.campbell@nashville.gov
Rex Gilley	WSP	757-466-9614	rex.gilley@wsp.com
Colin Williams	WSP	615-796-4616	colin.williams@wsp.com
Luke Sullivan	WSP	615-340-9196	luke.sullivan@wsp.com
Katrina Jones	Metro Public Works	615-862-8595	katrina.jones@nashville.gov
Jay Lanius	TDOT	615-253-1106	jay.lanius@tn.gov
James Schonk	STV on behalf of CSX	904-383-3922	james.schonk@stvinc.com
Eric McElory	WSP	615-981-8363	eric.mcelroy@wsp.com

TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION

PROJECT NO.: _____ ROUTE: S.R. 1 [BROADWAY]
COUNTY: DAVIDSON CITY: NASHVILLE
PROJECT PIN NUMBER: _____
PROJECT DESCRIPTION: BRIDGE AND APPROACHES OVER CSX RAILROAD AND 11th AVE. @ L.M. 17.29.

DIVISION REQUESTING:

MAINTENANCE	☐	PAVEMENT DESIGN	☐
S.T.I.D.	☒	STRUCTURES	☐
PROG. DEVELOPMENT & ADM.	☐	SURVEY & ROADWAY DESIGN	☐
PUBLIC TRANS. & AERO.	☐	TRAFFIC SIGNAL DESIGN	☐
		OTHER _____	☐

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
29,530	2023	41,760	4,176	10	2043	55-45	11	17		

REQUESTED BY: NAME SHAUN ARMSTRONG DATE 7/25/18
DIVISION S.T.I.D.
ADDRESS 1000 J. K. POLK BUILDING
NASHVILLE TN 37243

REVIEWED BY: DEBBI HOWARD Debbi Howard DATE 7/25/18
TRANSPORTATION MANAGER 1
SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: TONY ARMSTRONG Tony Armstrong DATE 7.25.18
TRANSPORTATION MANAGER 2
SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

THIS TRAFFIC IS BASED ON A 2018 CYCLE COUNT. THE DESIGN YEAR TRAFFIC IS BASED ON GROWTH RATE FROM THE NASHVILLE MPO COMPUTER ASSIGNMENT MODEL.

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

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR ADTs OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.
SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS. (REV. 4/1/18)

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane Tennessee FIPS 4100. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by the Metropolitan Government of Nashville and Davidson County. This information was photogrammetrically compiled from aerial photography dated March 2008.

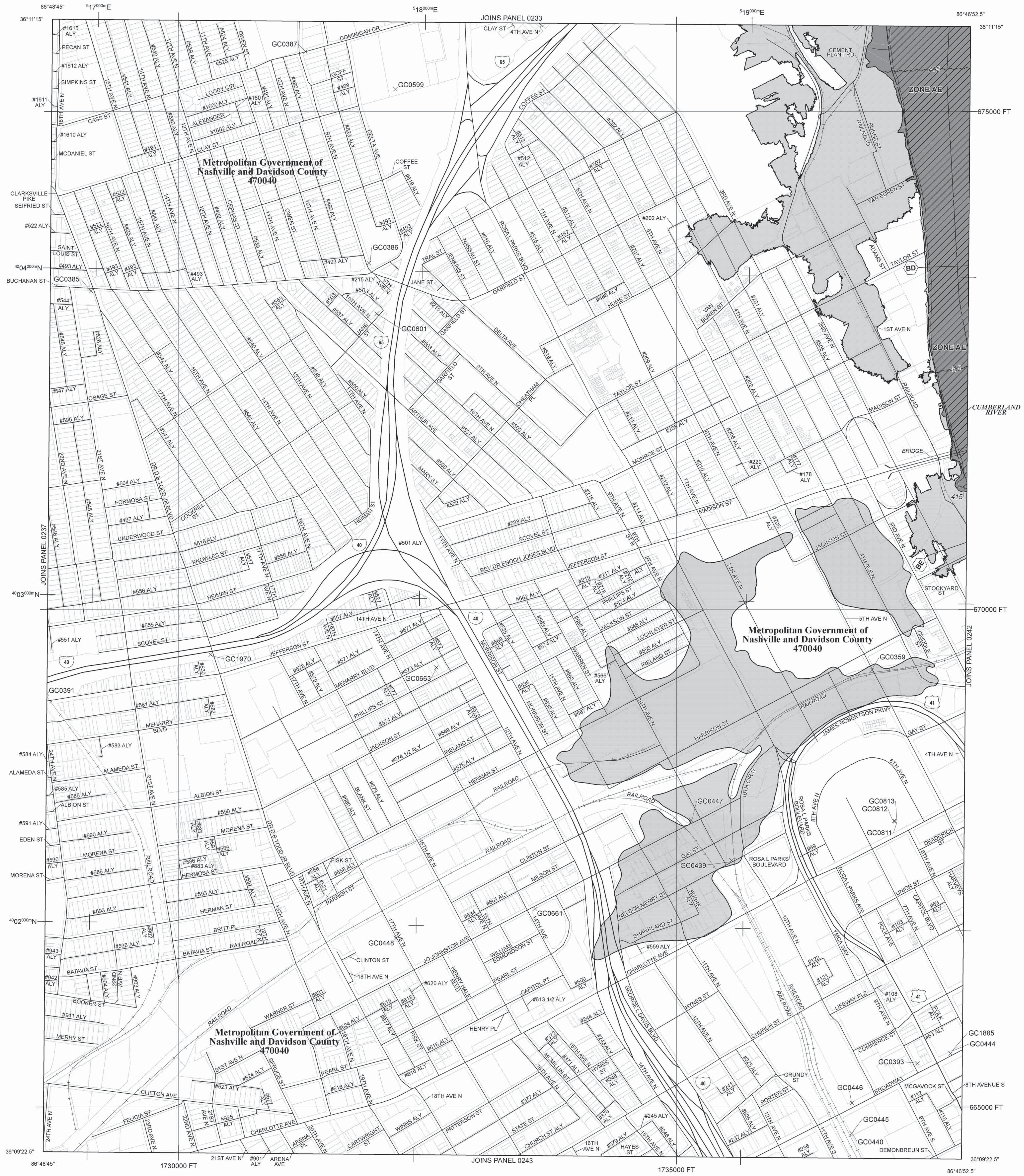
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For Information and **questions about this map**, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange** at 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov/. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

The "profile base lines" depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988	
A —— A	Cross section line
23 - - - 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4275000mE	1000-meter Universal Transverse Mercator grid ticks, zone 16
6000000 FT	5000-foot grid values: Tennessee State Plane coordinate system (FIPSZONE = 4100), Lambert projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
APRIL 20, 2001

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
April 5, 2017 – to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to add floodway, to add roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0241H

FIRM

FLOOD INSURANCE RATE MAP

METROPOLITAN GOVERNMENT OF
NASHVILLE AND
DAVIDSON COUNTY,
TENNESSEE
AND INCORPORATED AREAS

PANEL 241 OF 478
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY	470040	0241	H

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
47037C0241H

MAP REVISED
APRIL 5, 2017

Federal Emergency Management Agency

CHECKLIST OF DETERMINANTS FOR LOCATION STUDY

If any of the following facilities or ESE categories are located within the project area or corridor, place an "X" in the blank opposite the item. Where more than one alternate is to be considered, place its letter designation in the blank.

1.	Agricultural land usage		
2.	Airport (existing or proposed)		
3.	Commercial area or shopping center		
4.	Floodplains		
5.	Forested land		
6.	Historical, cultural, or natural landmark		X
7.	Industrial park or factory		
8.	Institutional usages		
	a.	School or educational institution	
	b.	Church, cemetery, or religious institution	
	c.	Hospital or medical facility	
	d.	Public building (e.g., fire station)	
	e.	Defense installation	
9.	Recreational usages		
	a.	Park or recreational area	
	b.	Game preserve or wildlife area	
10.	Residential establishment		
11.	Urban area, town, city, or community		X
12.	Waterway, lake, pond, river, stream, or spring		
	Permits Required:	Coast Guard	
		Section 404	
		TVA Section 26a Review	
		NPDES	
		Aquatic Resource Alteration	
13.	Other		
14.	Location coordinated with local officials		
15.	Railroad crossings		X
16.	Hazardous materials site		

TYPE	YEAR	COUNTY	FIGURE NO.
T.I.R	2019	DAVIDSON	2

BEGIN STUDY AREA
300' WEST OF
BEGIN PROJECT

APPROX. 100'
FROM C.L.

APPROX. 150' NORTH
ON 12TH AVE N

BEGIN PROJECT

11TH AVENUE NORTH

CSX RAILROAD (5) FIVE TRACKS

APPROX. 150' NORTH
ON 10TH AVE N

END STUDY AREA
300' EAST OF
END PROJECT

END PROJECT

STATE ROUTE 1 (BROADWAY)

STATE ROUTE 1 (BROADWAY)

APPROX. 150' SOUTH
ON 12TH AVE S

11TH AVENUE SOUTH

CSX RAILROAD

APPROX. 100'
FROM C.L.

10' SIDEWALK

0 100' 200' 300'

N

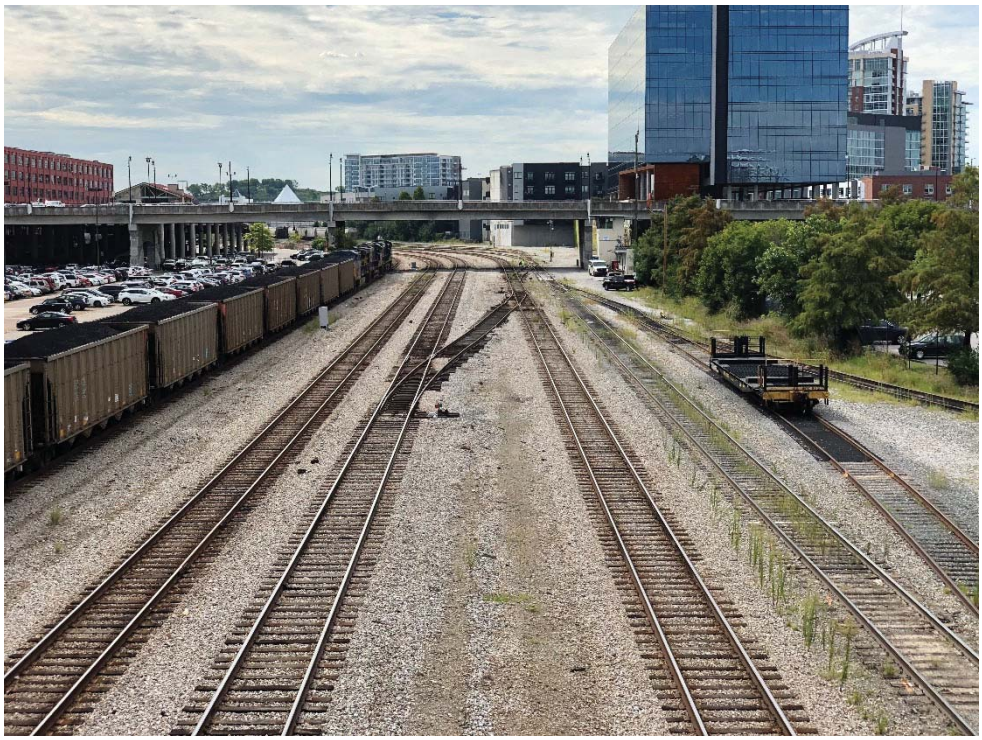
ENVIRONMENTAL TECHNICAL STUDY AREA

STATE ROUTE 1
BRIDGE 19SR0010019 OVER 11TH AVENUE SOUTH AND CSX RR (L.M. 17.29)
DAVIDSON COUNTY

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
S.T.I.D.

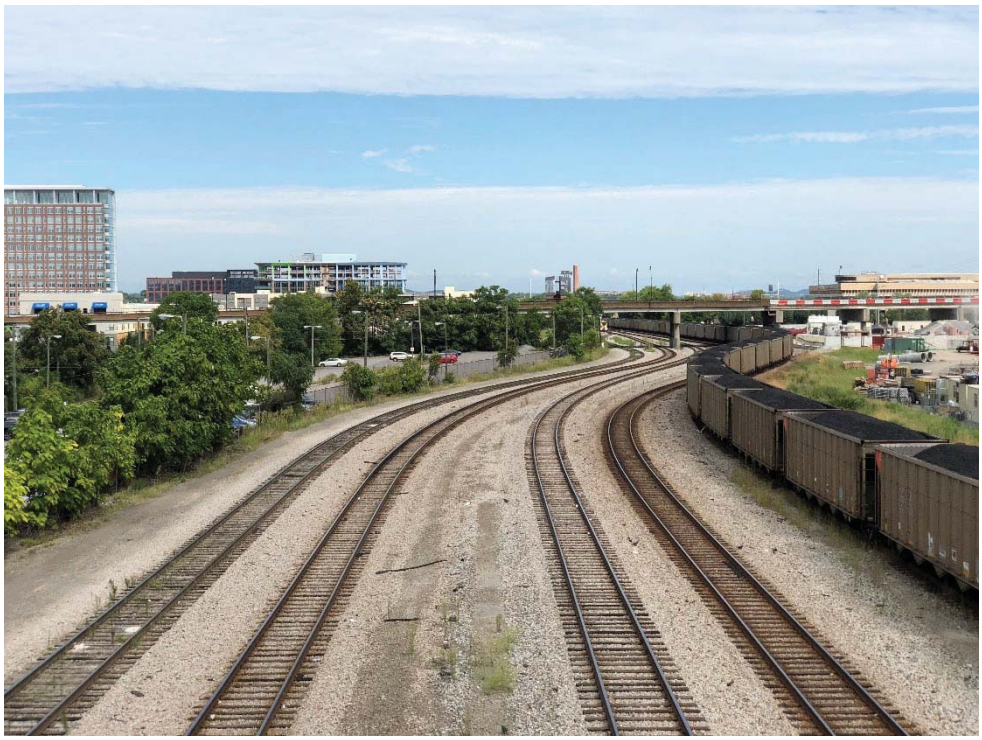
FIGURE 2
STATE ROUTE 1
L.M. 17.29

7/1/2020 8:39:09 AM
T:\PRJ\188689 TDOT STID On-Call\014 SR 1 Bridge TIR\124238-00-Proposed.dgn



View to South over CSX Rail

View to South over 11th Avenue



View to North over CSX Rail

View to North over 11th Avenue

West Bridge Approach

View of Bridge from West Approach

East Bridge Approach

View of Bridge from East Approach

View of Bridge connection detail with Union Station

View of Bridge over CSX Rails from South

View of Bridge from North

View under the Bridge from the 11th Street looking West