Appendix E: Air Quality and Noise Technical Memorandum

State Route 19 Environmental Assessment

From East of Eastland Avenue to East of SR-87

Lauderdale and Haywood Counties, Tennessee

PIN 102251.00

TDOT
Department of Transportation

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1.0 Introduction

The Tennessee Department of Transportation (TDOT), in cooperation with the Federal Highway Administration (FHWA), is proposing improvements to approximately 15.2 miles of State Route (SR) 19 from east of Eastland Avenue in Lauderdale County to east of SR-87 in Haywood County, Tennessee (**Figure 1**). Since the proposed project would be funded in part with federal transportation funds, it is subject to the requirements of the National Environmental Policy Act (NEPA). An Environmental Assessment (EA) is being prepared in accordance with NEPA to identify and evaluate the environmental effects of the proposed project and to identify measures to minimize harm.

This technical memorandum discusses local air quality analyses and possible impacts to noise-sensitive land uses within the limits of the SR-19 project area and provides an estimated effects determination for both the No-Build and Build Alternatives.

1.1 Project Background

On February 1, 2018, the FHWA approved a D-List Categorical Exclusion for the proposed widening of SR-19 from east of Eastland Avenue to east of SR-87 under TDOT project identification number (PIN) 102251.00.

Since the approval of 2018 D-List CE, the proposed SR-19 project has been divided into three segments for funding purposes; PIN 102251.01, 102251.02, and PIN 102251.03. The current EA effort is analyzing the entirety of the proposed SR-19 corridor from east of Eastland Avenue to east of SR-87 (PIN 102251.00), which is comprised of PIN 102251.01, PIN 102251.02, and PIN 102251.03 (**Figure 2**).

For more information on the project background, please refer to Chapter 1 in the EA.

Figure 1 Project Location

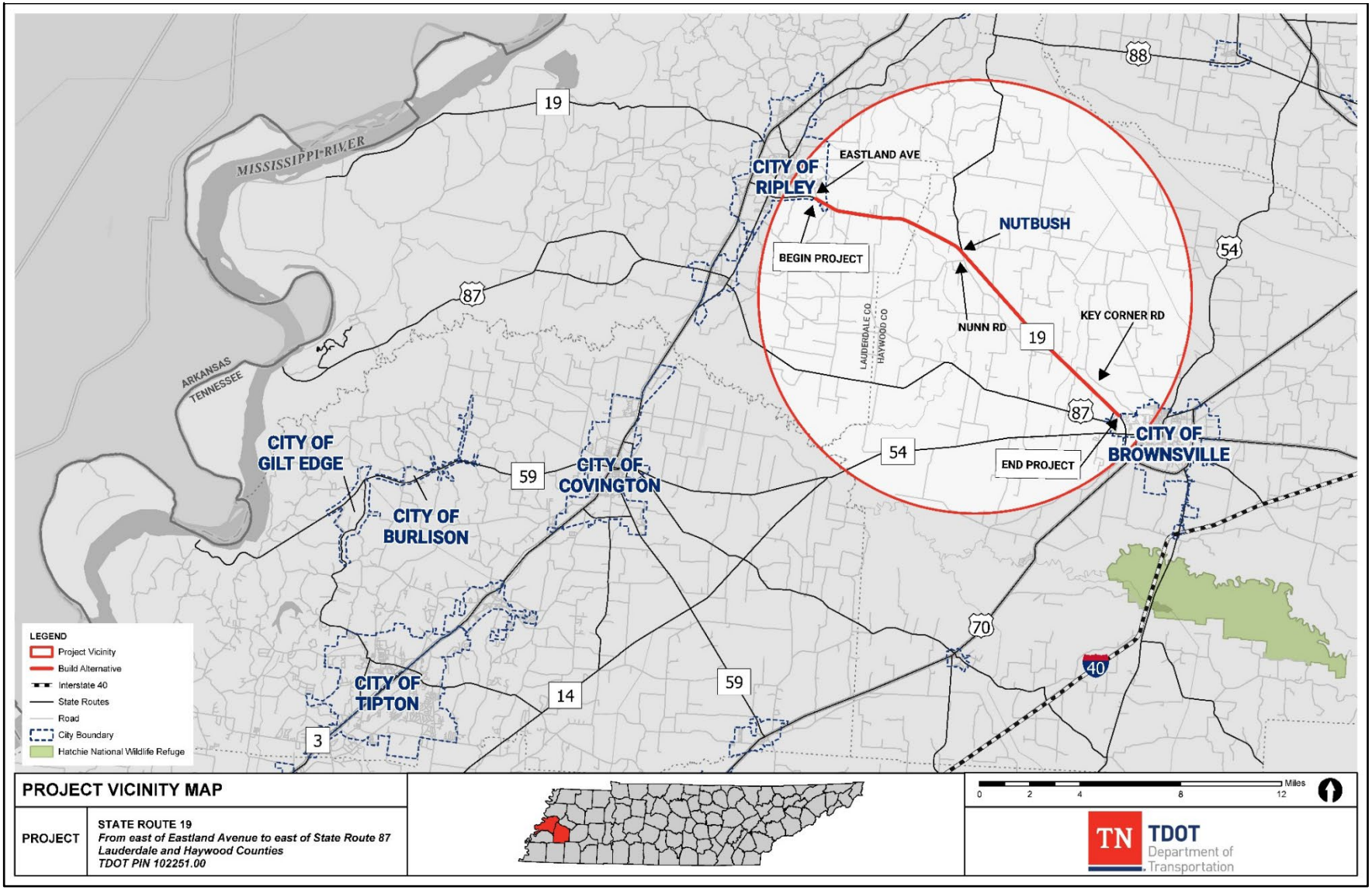
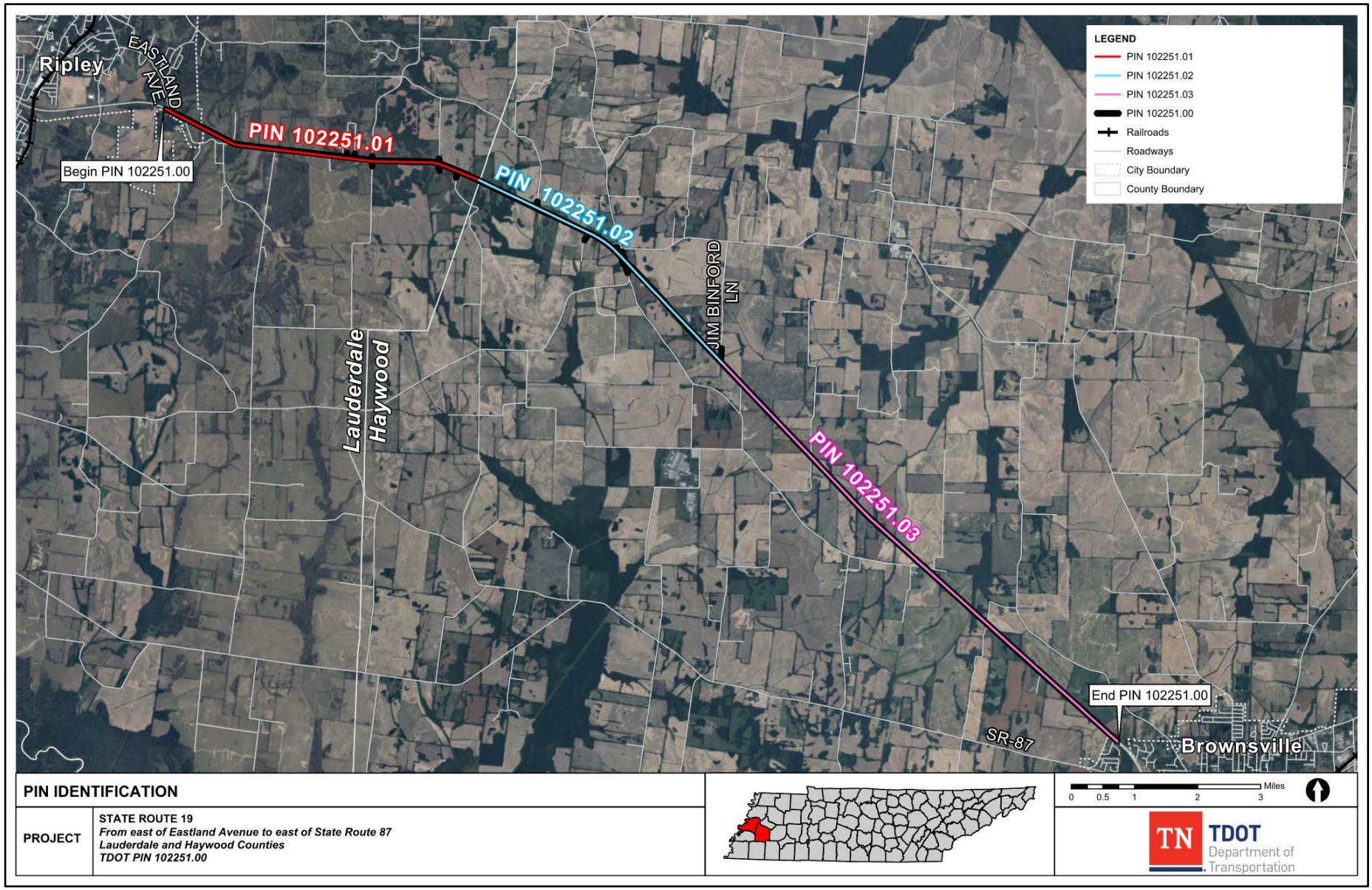


Figure 2 PIN Identification



1.2 Alternatives Under Consideration

A No-Build Alternative and one Build Alternative are being evaluated in the EA. Each alternative is described in the subsequent text below.

1.2.1 No-Build Alternative

The No-Build Alternative would leave the segment of SR-19 from east of Eastland Avenue to east of SR-87 as it currently exists except for routine maintenance and safety upgrades, as needed, or modifications that have been programmed and approved for implementation through TDOT's 25-Year Long Range Transportation Policy Plan, State Transportation Improvement Program (STIP), or TDOT 10-Year Project Plan. The No-Build Alternative is required by federal regulations to be evaluated in the EA and provides a baseline for comparing other alternatives.

1.2.2 Build Alternative

The Build Alternative proposes various roadway improvements along SR-19, from east of Eastland Avenue to east of SR-87. Proposed improvements would include widening, resurfacing, realignment of select intersections, and slope improvements (**Figure 3**).

From east of Eastland Avenue in Lauderdale County to just west of Gill Brackin Road in Haywood County, the proposed project would widen the existing 11-foot travel lanes (one in each direction) to two 12-foot travel lanes with 2-foot to 10-foot shoulders (8-foot paved). Along this segment of the proposed project, the roadway would be widened primarily to the north side of the existing roadway in the Lauderdale County portion and to the south side in Haywood County. In this section, the following intersections are proposed to be realigned:

- Willie Paris Road
- Ross Road/Gause Lane
- Tall Oaks Cove
- Sanford Road/Conner Whitefield Road
- Watson Road/Carney Road
- Springhill Road

From just west of Gill Brackin Road to Nunn Road, the proposed project would mill and resurface the existing 11-foot travel lanes and 2-foot shoulders. In this section, the following intersections are proposed to be realigned:

- Forked Deer Road (SR-180)
- Nunn Road

From Nunn Road to east of Jim Binford Lane, the proposed project would widen the two existing 11-foot travel lanes and 2-foot shoulders to two 12-foot travel lanes with 10-foot shoulders (8-foot paved). In this section, the following SR-19 intersection is proposed to be realigned:

- Jim Binford Lane

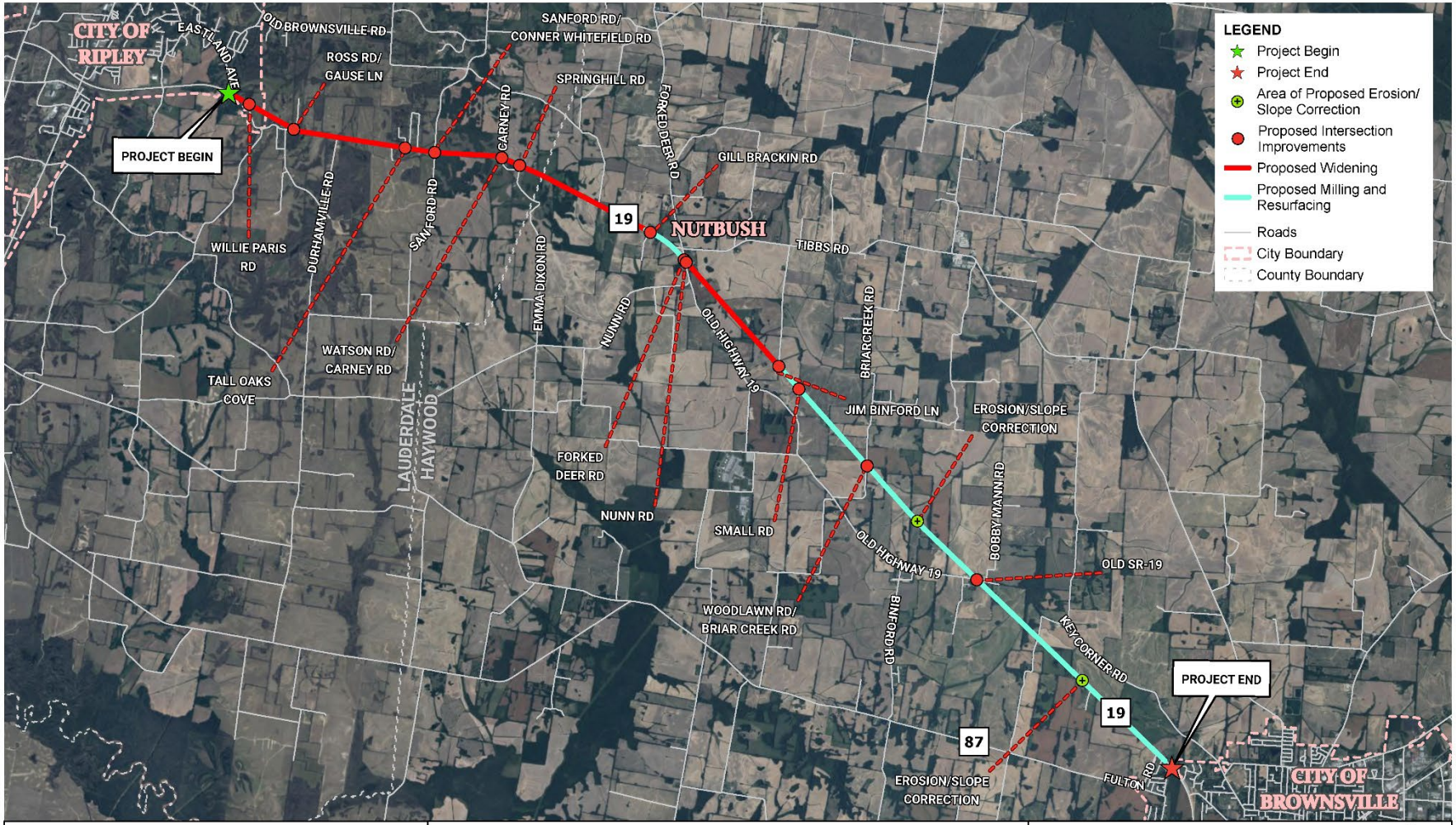
From east of Jim Binford Lane to east of SR-87, the proposed project would mill and resurface the existing 11-foot travel lanes and 2-foot shoulders. Additionally, the proposed project would correct erosion/slope issues from approximately 4,351 feet east of Woodlawn Road to approximately 4,411 feet west of Old SR-19 (approximately 1,700 feet) and from approximately 3,417 feet east of Patton Road to approximately 279 feet east of Westpointe Road (approximately 1,800 feet). In this section, the following intersections are proposed to be realigned:

- Small Road at SR-19
- Woodlawn Road/Briar Creek Road at SR-19
- Old SR-19 at SR-19

1.3 Environmental Technical Study Area

An Environmental Technical Study Area (ETSA) was developed for the proposed SR-19 project in order to document natural, cultural, and community resources within a broader study area than the immediate project footprint. Generally, the ETSA boundary is 250 feet on either side of the proposed centerline, 300 feet from the project termini, and 150 feet from intersections with sideroads. That way, if shifts to the proposed project design occur during project development, TDOT staff are aware of any resources that are present in the larger ETSA boundary.

Figure 3 SR-19 Improvement Locations



2.0 Air Quality and Noise

2.1 Environmental Studies Request

An Environmental Studies Request (ESR) was submitted to TDOT's Air Quality and Noise Section on February 3, 2025, based on the 2024 Line and Grade Plans reflecting the proposed design at that time. The Air Quality and Noise Section ESR report can be found in Attachment A. The TDOT Air Quality and Noise Section provided the following response on June 25, 2025:

> "*AIR QUALITY*
>
> *An air quality analysis for the project was conducted in accordance with the Tennessee Environmental Procedures Manual. The purposes of this analysis are to address potential air quality effects including transportation conformity, Mobile Source Air Toxics (MSATs), and construction air quality. The air quality technical reports are attached.*
>
> *Transportation Conformity*
>
> *This project is located in Haywood and Lauderdale Counties, which are in attainment for all regulated transportation related criteria pollutants. Therefore, conformity does not apply to this project.*
>
> *Mobile Source Air Toxics (MSATs)*
>
> *The highest projected design year 2049 AADT [Average Annual Daily Traffic] on SR-19 for the combined three segments of the project is 12,010 vehicles per day and is substantially lower than the FHWA criterion. Additionally, it is expected that the project will cause no change in overall MSAT emissions. Therefore, the project meets the criteria for a "Project with Low Potential MSAT Effects."*
>
> *Construction Air Quality*
>
> *Construction activities will generate intermittent and temporary construction-related pollutant emissions and dust.*
>
> *TDOT's construction specifications will apply to this project. Construction procedures should be governed by the Standard Specifications for Road and Bridge Construction as issued by TDOT and as amended by the most recent applicable supplements. All construction equipment shall be maintained, repaired, and adjusted to keep it in full satisfactory*

condition. Additionally, there are no air quality monitoring stations close to the project. The closest station is a PM2.5 monitoring system in Dyersburg Tennessee approximately 21 miles northeast of the project.

NOISE

This project will not add travel or auxiliary lanes, will not halve the distance between the center of the near travel lane and remaining adjacent noise-sensitive land use, or substantially change the grade. Therefore, the project is Type III in accordance with the FHWA noise regulation in 23 CFR 772 and TDOT's noise policy and a noise study is not needed."

Following changes to the proposed design, revised Line and Grade Plans from July 2025 were provided to the TDOT Air Quality and Noise Section. In an email dated July 22, 2025, the TDOT Air Quality and Noise Section responded that "*The Air Quality Technical Report and ESR responses for air quality and noise studies provided 06/25/2025 remain valid.*"

Copies of the TDOT Air Quality and Noise Section's June 25, 2025 ESR response and the July 22, 2025 email are in Attachment A. The Air Quality Technical Report is in Attachment B.

3.0 Impacts to Air Quality and Noise

3.1 No-Build Alternative

The No-Build Alternative would not make changes to the existing roadway network; therefore, it would not result in direct noise impacts or impact to the current, local air quality.

3.2 Build Alternative

3.2.1 Air Quality

Based on the July 2025 Revised Line and Grade Plans, conformity regulations would not apply to the proposed project since Haywood and Lauderdale counties are in attainment for all regulated transportation-related criteria pollutants.

When considering Mobile Source Air Toxics (MSATs), the highest projected traffic (3,820 annual average daily traffic (AADT) on the road is substantially lower than the FHWA criterion (greater than 140,000 AADT)[1]. It is also expected that the proposed project would

[1] https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm

cause no change in overall MSATs. Therefore, the project is not expected to result in transportation conformity or MSAT emission impacts.

The closest air quality monitoring station to the proposed project is a PM2.5 monitoring system in Dyersburg, Tennessee, which is approximately 21 miles from the proposed project.

Construction activities would generate intermittent and temporary construction-related pollutant emissions and dust. TDOT's construction specifications and TDOT's Standard Specifications for Road and Bridge Construction[2] would apply to the proposed project.

3.2.2 Noise

Based on the July 2025 Revised Line and Grade Plans, it was determined that proposed project meets the criteria of a Type III project in accordance with the FHWA noise regulation in 23 CFR 772. Type III projects do not require highway agencies to complete a noise analysis or consider abatement measures.

4.0 Minimization and Mitigation Measures to Address Impacts

4.1 Air Quality

To mitigate the temporary generation of construction-related pollutant emissions, standard best management practices would be implemented in accordance with the procedures in TDOT's Standard Specifications for Road and Bridge Construction, as amended by the most recent applicable supplements.

4.2 Noise

To mitigate the temporary generation of construction-related noise impacts, TDOT construction specifications would apply to this project. The contractor would follow the procedures in TDOT's *Standard Specifications for Road and Bridge Construction* as amended by the most recent applicable supplements.

[2] https://www.tn.gov/tdot/tdot-construction-division/transportation-construction-division-resources/2021-standard-specifications.html

5.0 Air Quality and Noise Memorandum Summary

Table 1 summarizes potential impacts to air quality and noise resources and proposed minimization and mitigation efforts, as necessary, for the No-Build and Build Alternatives.

Table 1 Air Quality and Noise Impact Summary

	No-Build Alternative	Build Alternative	
Impact Category	**Effect Determination**	**Effect Determination**	**Minimization/Mitigation Measures to Address Impacts**
Air Quality	No Effect	The Build Alternative is located within Lauderdale and Haywood Counties, which are both in attainment for all regulated criteria pollutants. Therefore, transportation conformity would not apply to the proposed project. The Build Alternative qualifies as a "Project with Low Potential Mobile Source Air Toxic (MSAT) Effect" and is not anticipated to create adverse MSAT effects. The Build Alternative may generate intermittent and temporary construction-related pollutant emissions and dust.	To mitigate temporary construction-related pollutant emissions, TDOT's construction specifications will apply to this project. Construction procedures will be governed by TDOT's *Standard Specifications for Road and Bridge Construction*, as amended by the most recent applicable supplements. All construction equipment shall be maintained, repaired, and adjusted to keep it in full satisfactory condition.
Noise	No Effect	The Build Alternative was determined to be Type III in accordance with 23 CFR 772, which does not require highway agencies to complete a noise analysis or consider abatement measures.	To mitigate the temporary generation of construction-related noise, standard best management practices will be implemented in accordance with the procedures in TDOT's *Standard Specifications for Road and Bridge Construction*, as amended by the most recent applicable supplements.

ATTACHMENTS

ATTACHMENT A
TDOT Air Quality and Noise Section Coordination

From: TDOT.Env AirNoise <TDOT.Env.AirNoise@tn.gov>
Sent: Tuesday, July 22, 2025 8:57 AM
To: Benjamin Webb <Benjamin.Webb@tn.gov>; Braxton Eden <Braxton.Eden@tn.gov>; TDOT.Env NEPA <TDOT.Env.NEPA@tn.gov>
Subject: RE: R4, InitialTechReq, Haywood and Lauderdale County, PIN 102251.00

Good Morning,

The Air Quality Technical Report and ESR responses for air quality and noise studies provided 06/25/2025 remain valid.

Thank you,

Chasity Stinson | TDOT Senior Technical Specialist
Tennessee Department of Transportation (TDOT) | Environmental Division
Technical Studies Office, Hazardous Materials/Air and Noise Section
James K. Polk Building, 9th Floor
505 Deadrick St, Suite 900, Nashville, TN 37243
Phone: 615-532-9948
Email: chasity.l.stinson@tn.gov

From: Benjamin Webb <Benjamin.Webb@tn.gov>
Sent: Monday, July 21, 2025 6:32 AM
To: Braxton Eden <Braxton.Eden@tn.gov>; TDOT.Env AirNoise <TDOT.Env.AirNoise@tn.gov>; TDOT.Env Ecology <TDOT.Env.Ecology@tn.gov>; TDOT.Env HazmatOffice <TDOT.Env.HazmatOffice@tn.gov>; TDOT.Env CulturalResources <TDOT.Env.CulturalResources@tn.gov>; TDOT MultimodalPlanning <TDOT.MultimodalPlanning@tn.gov>
Cc: Erick Hunt-Hawkins <Erick.Hunt-Hawkins@tn.gov>; Birch, Valerie <Valerie.Birch@hdrinc.com>; Eden, Braxton <Braxton.Eden@hdrinc.com>; Banaszak, Jennifer <Jennifer.Banaszak@hdrinc.com>; Jessica Schlagenhaft <Jessica.Schlagenhaft@tn.gov>; Monica Kain <Monica.Kain@tn.gov>; Seth Hendren <Seth.Hendren@tn.gov>; Rita M. Thompson <Rita.M.Thompson@tn.gov>
Subject: RE: R4, InitialTechReq, Haywood and Lauderdale County, PIN 102251.00

Attached is the revised KMZ for SR 19. Please note that only the 03 PIN underwent small revisions. 01 and 02 remain the same as before. Let me know if you have trouble accessing the file.

Ben Webb, P.E., PMP | Project Manager
Region 4 Project Management
300 Benchmark Pl, Jackson, TN 38301
c. 731-747-5006
benjamin.webb@tn.gov

From: Benjamin Webb
Sent: Thursday, July 17, 2025 9:37 AM
To: Braxton Eden <Braxton.Eden@tn.gov>; TDOT.Env AirNoise <TDOT.Env.AirNoise@tn.gov>; TDOT.Env Ecology <TDOT.Env.Ecology@tn.gov>; TDOT.Env HazmatOffice <TDOT.Env.HazmatOffice@tn.gov>; TDOT.Env CulturalResources <TDOT.Env.CulturalResources@tn.gov>; TDOT MultimodalPlanning <TDOT.MultimodalPlanning@tn.gov>
Cc: Erick Hunt-Hawkins <Erick.Hunt-Hawkins@tn.gov>; Birch, Valerie <Valerie.Birch@hdrinc.com>; Eden, Braxton <Braxton.Eden@hdrinc.com>; Banaszak, Jennifer <Jennifer.Banaszak@hdrinc.com>; Jessica Schlagenhaft <Jessica.Schlagenhaft@tn.gov>; Monica Kain <Monica.Kain@tn.gov>; Seth Hendren <Seth.Hendren@tn.gov>
Subject: RE: R4, InitialTechReq, Haywood and Lauderdale County, PIN 102251.00

All,

I spoke with Chasity from Air and Noise this morning. She pointed out that there was a section of linework that extended past the ETSA on 102251.03. This was due to the original survey being done before the bypass was built. I have reached to the design consultant and they are going to trim out the linework that extends past the ETSA boundary and I will send out the revised KMZ for 03.

Ben Webb, P.E., PMP | Project Manager
Region 4 Project Management
300 Benchmark Pl, Jackson, TN 38301
c. 731-747-5006
benjamin.webb@tn.gov

From: Braxton Eden <Braxton.Eden@tn.gov>
Sent: Monday, July 14, 2025 12:01 PM
To: TDOT.Env AirNoise <TDOT.Env.AirNoise@tn.gov>; TDOT.Env Ecology <TDOT.Env.Ecology@tn.gov>; TDOT.Env HazmatOffice <TDOT.Env.HazmatOffice@tn.gov>; TDOT.Env CulturalResources <TDOT.Env.CulturalResources@tn.gov>; TDOT MultimodalPlanning <TDOT.MultimodalPlanning@tn.gov>
Cc: Erick Hunt-Hawkins <Erick.Hunt-Hawkins@tn.gov>; Birch, Valerie <Valerie.Birch@hdrinc.com>; Eden, Braxton <Braxton.Eden@hdrinc.com>; Banaszak, Jennifer <Jennifer.Banaszak@hdrinc.com>; Jessica Schlagenhaft <Jessica.Schlagenhaft@tn.gov>; Monica Kain <Monica.Kain@tn.gov>; Benjamin Webb <Benjamin.Webb@tn.gov>; Seth Hendren <Seth.Hendren@tn.gov>
Subject: RE: R4, InitialTechReq, Haywood and Lauderdale County, PIN 102251.00

Good afternoon,

Since the distribution of the original ESR in February, the proposed project design has changed after discussions with TDOT Project Management.

Please see the current proposed project description below:

The Build Alternative proposes to widen the existing two 11-foot travel lanes of SR-19 from east of Eastland Avenue in Lauderdale County to just west of Gill Brackin Road in Haywood County to two 12-foot travel lanes and widen the shoulders from 2-foot shoulders to 10-foot shoulders (8-foot paved). To widen the travel lanes in this section of the proposed project, right-of-way would need to be acquired and the travel lanes reconstructed primarily to the north side of the existing roadway in the Lauderdale County section and primarily to the south side of the roadway in Haywood County. Also, in this section of the proposed project, the following SR-19 intersections are proposed to be realigned:

- *Willie Paris Road*
- *Ross Road/Gause Lane*
- *Tall Oaks Cove*
- *Sanford Road/Conner Whitefield Road*
- *Watson Road/Carney Road*
- *Springhill Road*

From just west of Gill Brackin Road to Nunn Road, the proposed project would mill and resurface the existing 11-foot travel lanes and 2-foot shoulders. In this section, the following SR-19 intersections are proposed to be realigned:

- *Forked Deer Road (SR-180)*
- *Nunn Road*

From Nunn Road to east of Jim Binford Lane, the proposed project would widen the two existing 11-foot travel lanes and 2-foot shoulders to two 12-foot travel lanes with 10-foot shoulders (8-foot paved). In this section, the following SR-19 intersection is proposed to be realigned:

- *Jim Binford Lane*

From east of Jim Binford Lane to the project terminus east of SR-87, the proposed project would mill and resurface the existing 11-foot travel lanes and 2-foot shoulders. Additional right-of-way would be needed to correct erosion/slope issues from approximately 4,351 feet east of Woodlawn Road to approximately 4,411 feet west of Old SR-19 (approximately 1,700 feet) and from approximately 3,417 feet east of Patton Road to approximately 279 feet east of Westpointe Road (approximately 1,800 feet). In this section, the following intersections are proposed to be realigned:

- *Small Road at SR-19*
- *Woodlawn Road/Briar Creek Road at SR-19*
- *Old SR-19 at SR-19*

Attached is a revised KMZ that captures the current proposed project design for the entirety of the project corridor. NEPA is requesting a review of the above listed proposed project description + revised KMZ.

This KMZ is based on forthcoming Simplified Functional plans for all three child PINs for the whole corridor. The updated KMZ has also been placed in the OneDrive link provided in the original ESR. If your respective section requires the full PDF version of the plan sets to make a determination , those will be circulated upon receipt. However, the provided KMZ will not vary from what will be presented in the Simplified Functional plans.

Please let us know if previous responses would remain valid, if additional studies would be necessary, or any other concerns your section may have.

We appreciate your flexibility with this project. If you have any questions, please reach out!

Thank you,

Braxton Eden
Environmental Division | NEPA Section
James K. Polk Building, 9th Floor
Email: TDOT.Env.LocalPrograms@tn.gov

/

From: Braxton Eden <Braxton.Eden@tn.gov>
Sent: Monday, February 3, 2025 1:03 PM
To: TDOT.Env AirNoise <TDOT.Env.AirNoise@tn.gov>; TDOT.Env Ecology <TDOT.Env.Ecology@tn.gov>; TDOT.Env HazmatOffice <TDOT.Env.HazmatOffice@tn.gov>; TDOT.Env CulturalResources <TDOT.Env.CulturalResources@tn.gov>; TDOT MultimodalPlanning <TDOT.MultimodalPlanning@tn.gov>
Cc: Erick Hunt-Hawkins <Erick.Hunt-Hawkins@tn.gov>; Rachel Head <Rachel.Head@tn.gov>; Birch, Valerie <Valerie.Birch@hdrinc.com>; Eden, Braxton <Braxton.Eden@hdrinc.com>; Banaszak, Jennifer <Jennifer.Banaszak@hdrinc.com>
Subject: R4, InitialTechReq, Haywood and Lauderdale County, PIN 102251.00

Date ESR request transmitted to tech: 2/3/2025

Completed ESR due: 3/25/2025

*Review the feasibility of the above due date and respond to sender regarding the feasibility of that date by: **2/17/2025** or the next business day if on a wee

If infeasible, in the response to NEPA, briefly note why and provide an anticipated completion date.

Project Information:

County	Haywood, Lauderdale
Route	SR-19
Termini	From east of Eastland Avenue in Lauderdale County to east of SR-87 in Haywood Coun
PIN	102251.00 102251.00, 102251.02, 102251.03
Brief Project Description/Scope	From east of Eastland Avenue in Lauderdale County to just west of Gill Brackin Road in Haywood Cou would widen the two travel lanes to 12 feet with 10-foot shoulders (8-foot paved), correct geometric realign several intersections. From just west of Gill Bracken Road to the project terminus east of SR- would mill and resurface the existing 11-foot travel lanes and 2-foot shoulders and realign several
Federal Funding #	PIN 102251.00 PE-N: STP-19(47)
State Funding #	PIN 102251.00 PE-N: 38004-0217-14, 49005-0226-14
If State Only, is Federal funding anticipated?	

*Note for above: If not already known by NEPA Planner, Planner will mark "unknown." If "unknown" and a technical discipline needs this information for their wor discipline is responsible for investigating. Any findings should be shared with the NEPA Planner.

List of attachments or links to associated documentation:	1. ESR 2) ETSA (Three Files) 3) Aerial Layout KMZ OneDrive Link: SR-19, PIN 102251.00, ESR

*Note for above: ESR responses must be based on the plans/documents noted in the ESR form. Responses must **not** be based on other documents, even if more re NEPA Planners will submit an updated ESR if the review should be based on different plans/documents.

Current NEPA Office Action	Original NEPA Document
Date of last official NEPA/TEER approval	D-List CE, 02/01/2018 (see other relevant history and notes below)

*Note for above: Where applicable, technical reviews should compare the current plans to those relevant to the above noted **official** NEPA or TEER effort to ensure the cumulative change(s) since the last official approval.

Known changes since the last official NEPA/TEER approval	Due to an increase in relocations along the project corridor, the scope was reduced from the Supe proposed in the 2018 D-List CE. See project description above for details. The project has also since l into three child PINs.

*Note for above: Though NEPA provides the results of their comparison above, tech should still do a reasonable independent review for changes. Some changes will to some than to others (often depending on subject matter expertise).

Other Relevant History and Notes:	Through coordination with FHWA, the class of action was raised from a D-List CE to an EA due to relocations.

If you are unable to access the link or have additional questions, please reach out.

Please continue to copy those originally copied on this request on your section's responses.

Thank you!

/

Braxton Eden
Environmental Division | NEPA Section
James K. Polk Building, 9th Floor
505 Deaderick Street, Suite 900, Nashville, TN 37243
Email: TDOT.Env.LocalPrograms@tn.gov

Environmental Studies

Air and Noise

Environmental Studies Request

Project Information

Route: State Route 19

Termini: From east of Eastland Avenue in Lauderdale County to east of SR-87 in Haywood County

County: Lauderdale and Haywood County

PIN: 102251.00
102251.00, 102251.02, 102251.03

Request

Request Type: Initial Environmental Study

Project Plans: ETSA

Date of Plans: 05/16/2024

Location: FTP

Link: https://tennessee-my.sharepoint.com/:f:/g/personal/jjct871_tn_gov/EifR8AHZOdxGhggLA_YFoIIB8bCrYwDxUhgrZnv1uiQCkg?e=4OBbsV

Certification

Requestor: Braxton Eden

Title: NEPA Consultant

Signature: Braxton Eden

Digitally signed by Braxton Eden
Date: 2025.02.03 12:51:29 -06'00'

Environmental Study

Technical Section

Section: Air and Noise

Study Results

AIR QUALITY

An air quality analysis for the project was conducted in accordance with the Tennessee Environmental Procedures Manual. The purposes of this analysis are to address potential air quality effects including transportation conformity, Mobile Source Air Toxics (MSATs), and construction air quality. The air quality technical reports are attached.

Transportation Conformity
This project is located in Haywood and Lauderdale Counties, which are in attainment for all regulated transportation-related criteria pollutants. Therefore, conformity does not apply to this project.

Mobile Source Air Toxics (MSATs)
The highest projected design year 2049 AADT on SR-19 for the combined three segments of the project is 12,010 vehicles per day and is substantially lower than the FHWA criterion. Additionally, it is expected that the project will cause no change in overall MSAT emissions. Therefore, the project meets the criteria for a “Project with Low Potential MSAT Effects.”

Construction Air Quality
Construction activities will generate intermittent and temporary construction-related pollutant emissions and dust.

TDOT’s construction specifications will apply to this project. Construction procedures should be governed by the Standard Specifications for Road and Bridge Construction as issued by TDOT and as amended by the most recent applicable supplements. All construction equipment shall be maintained, repaired, and adjusted to keep it in full satisfactory condition.

Additionally, there are no air quality monitoring stations close to the project. The closest station is a PM2.5 monitoring system in Dyersburg Tennessee approximately 21 miles northeast of the project.

NOISE

This project will not add travel or auxiliary lanes, will not halve the distance between the center of the near travel lane and remaining adjacent noise-sensitive land use, or substantially change the grade. Therefore, the project is Type III in accordance with the FHWA noise regulation in 23 CFR 772 and TDOT's noise policy and 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? **Yes**

Type: Air Quality Technical Report

Location: Email Attachment

Certification

Responder: Chasity L. Stinson

Title: Senior Technical Specialist, TDOT Environmental Division

Signature: Chasity Stinson

Digitally signed by Chasity Stinson
Date: 2025.06.25 09:17:22 -05'00'

ATTACHMENT B
Air Quality Technical Reports

Air Quality Technical Report
for
State Route 19 from East of Eastland Avenue to Haywood County Line

Lauderdale County, Tennessee

PIN Number: 102251.01

Submitted to:

TN TDOT Department of Transportation

Prepared by:

Stantec Consulting Services, Inc.

Stantec

May 2025

Table of Contents

TABLES

FIGURES

LIST OF APPENDICES

Executive Summary

The air quality evaluation was conducted per the Tennessee Department of Transportation (TDOT) *Tennessee Environmental Procedures Manual* (TDOT, 2011).

The purposes of this analysis are to address the transportation conformity requirements for the project, the potential Mobile Source Air Toxics (MSATs) effects, and construction air quality.

The evaluation concluded that this project is located in Lauderdale County, which is in attainment for all regulated transportation-related criteria pollutants. Therefore, conformity does not apply to this project. Additionally, travel speeds for the Build Alternative are expected to be higher than for the No-Build Alternative which will reduce emissions by increasing speeds; according to EPA's MOVES5 model, emissions of all the priority MSAT pollutants decrease as speed increases.

1.0 Introduction

This report summarizes the results of an analysis of the potential air quality effects of the proposed project to improve road conditions along State Route (SR) 19 from east of Eastland Avenue in Lauderdale County to east of SR 87 in Haywood County. The project will include widening and spot improvements at various locations along the corridor. Due to the size of improvements to the corridor, the TDOT has split this project into three segments. The first segment of roadway spans from Eastland Avenue to the Haywood County line, the second segment of roadway spans from the Lauderdale County line to Binford Lane, and the third segment of roadway spans form Binford Lane to SR-87.

The SR-19 corridor provides a critical connection from Ripley, Tennessee, to Brownsville along Interstate-40; additionally, traffic along this corridor is projected to increase due to additional development at and around the Memphis Regional Megasite. Additionally, this segment of SR-19 is a proposed bicycle route in the Tennessee State Bicycle Route System. Expansion of the existing roadway and shoulders will significantly improve the level of service for bicycles. The planned alignment for SR-19 along a portion of the project corridor is a "Super Two-Lane" typical section, which includes one 12-foot travel lane in each direction and 10-foot outside shoulders. A Super Two-Lane design provides operational, and safety benefits compared to a traditional two-lane roadway, especially for freight traffic, while remaining more cost-efficient than a wider alignment. This report will focus on the first segment of the project, which is located in Lauderdale County and will span from Eastland Avenue to the Haywood County Line.

The project area is shown in Figure 1.

2.0 Air Quality Evaluation

The air quality evaluation was conducted per TDOT's *Tennessee Environmental Procedures Manual* (TDOT 2011).

The purposes of this analysis are to address the transportation conformity requirements for the project as well as the potential Mobile Source Air Toxics (MSAT) effects.

2.1 National Ambient Air Quality Standards (NAAQS)

The United States Environmental Protection Agency (EPA) has established allowable concentrations and exposure limits called the National Ambient Air Quality Standards

(NAAQS) for various "criteria" pollutants. These pollutants include carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), sulfur oxides (SO_x), and lead (Pb).

Per the Clean Air Act Amendments of 1990 (CAAA of 1990), EPA identified areas that did not meet the NAAQS for the criteria pollutants and designated them as "nonattainment" areas. Once a nonattainment area meets the NAAQS, it is redesignated as a "maintenance" area.

This project is in Lauderdale County which is in attainment for all regulated transportation-related criteria pollutants.

2.2 Transportation Conformity

Transportation conformity is a process required of Metropolitan Planning Organizations (MPOs) under the CAAA of 1990. CAAA requires that transportation plans, programs, and projects in nonattainment or maintenance areas that are funded or approved by the Federal Highway Administration (FHWA) conform to the State Implementation Plan (SIP), which represents the state's plan to either achieve or maintain the NAAQS for a particular pollutant.

Projects conform to the SIP if they are included in a fiscally constrained and conforming Long Range Transportation Plan (LRTP) or Transportation Improvement Program (TIP).

This project is located in Lauderdale County, which is in attainment for all regulated transportation-related criteria pollutants. Therefore, conformity does not apply to this project.

2.3 Mobile Source Air Toxics

On February 3, 2006, the FHWA released "*Interim Guidance on Air Toxic Analysis in NEPA Documents.*" This guidance was superseded on September 30, 2009, December 6, 2012, October 16, 2016, and most recently on January 23, 2023, by FHWA's "*Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents.*" (FHWA 2023). The purpose of FHWA's guidance is to advise on when and how to analyze Mobile Source Air Toxics (MSAT) in the NEPA process for highways. This guidance is interim, because MSAT science is still evolving. As science progresses, FHWA will continue to revise and update the guidance.

The qualitative analysis presented below provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The assessment is derived in part from a study conducted by the FHWA entitled *"A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives"* (Claggett, 2006). Appendix B provides additional information regarding MSAT.

FHWA's Interim Guidance groups projects into the following categories:

- Exempt Projects and Projects with no Meaningful Potential MSAT Effects;
- Projects with Low Potential MSAT Effects; and
- Projects with Higher Potential MSAT Effects.

FHWA's Updated Interim Guidance provides examples of "Projects with Low Potential MSAT Effects." These projects include minor widening projects and new interchanges, such as those that replace a signalized intersection on a surface street, or where design year traffic projections are less than 140,000 to 150,000 average annual daily traffic (AADT).

The Build Alternative includes improvements to SR-19 in Lauderdale and Haywood counties, including widening and spot improvements at various locations along the corridor. The entire project stretches from east of Eastland Avenue in Lauderdale County to east of SR-87 in Haywood County. The planned alignment for SR-19 along a portion of the project corridor is a "Super Two-Lane" typical section, which includes one 12-foot travel lane in each direction and 10-foot outside shoulders. This first segment of this project will span from Eastland Avenue to Haywood County Line and incorporate widening SR-19 to a Super Two-Lane Road, which includes one 12-foot travel lane in each direction and 10-foot outside shoulders.

The highest projected design year 2049 AADT on SR-19 for the first segment of the project spanning from Eastland Avenue to the Haywood County Line is 8,320 vehicles per day and substantially lower than the FHWA criterion. Therefore, the project meets the criteria for a "Project with Low Potential MSAT Effects."

For both the Build and No-Build Alternatives, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. As shown, the projected VMT for the No-Build

Alternative is 16,044 miles and the projected VMT for the Build Alternative is 16,044. Therefore, it is expected that the project will cause no change in overall MSAT emissions.

The project may also reduce emissions by increasing speeds; according to EPA's MOVES model, emissions of all the priority MSAT decrease as speed increases (FHWA, Appendix B). Travel speeds for the Build Alternative are expected to be higher than for the No-Build Alternative.

In sum, reduced MSAT emissions are expected in the immediate project area under the Build Alternative in the 2049 design year, relative to the No-Build Alternative. The reductions are due to major roadway changes to SR-19 allowing for traffic to move more freely and at greater speeds; thus, increasing efficiency of the roadway while decreasing MSAT. Additionally, EPA's vehicle and fuel regulations coupled with fleet turnover, will cause substantial reductions over time that, in almost all cases, will cause region wide MSAT levels to be significantly lower than today.

Substantial construction related MSAT emissions are not anticipated for this project as construction is not planned to occur over an extended building period. However, construction activity may generate temporary increases in MSAT emissions in the project area.

2.4 Construction Air Quality

Construction activities will generate intermittent and temporary construction-related pollutant emissions and dust.

TDOT's construction specifications will apply to this project. Construction procedures should be governed by the *Standard Specifications for Road and Bridge Construction* as issued by TDOT and as amended by the most recent applicable supplements. All construction equipment shall be maintained, repaired, and adjusted to keep it in full satisfactory condition.

Additionally, there are no air quality monitoring stations close to the project. The closest station is a $PM_{2.5}$ monitoring system in Dyersburg Tennessee approximately 21 miles northeast of the project.

3.0 Conclusions

The purpose of the improvements to SR-19 is to increase vehicle capacity on the existing corridor to meet future traffic demands; Provide an improved Level of Service (LOS) for motorists and truck traffic; and alleviate traffic congestion during peak hours, particularly for commuters. This project is located in Lauderdale County, which is in attainment for all regulated transportation-related criteria pollutants. Therefore, conformity does not apply to this project. Additionally, travel speeds for the Build Alternative are expected to be higher than for the No-Build Alternative which will reduce emissions by increasing speeds; according to EPA's MOVES model, emissions of all the priority MSAT decrease as speed increases.

4.0 References

Claggett, M., et. al., "*A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives,"* Federal Highway Administration Resource Center, May 4, 2006.

Council on Environmental Quality (CEQ), *Update to the Regulations Implementing the National Environmental Policy Act*, May 1, 2024.

Federal Highway Administration (FHWA), *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents*, January 18, 2023.

Federal Highway Administration (FHWA), *Vulnerability Assessment and Adaptation Framework, Third Edition, FHWA-HEP-18-020*, December 2017.

Tennessee Department of Transportation (TDOT), *Tennessee Environmental Procedures Manual*, June 2011.

Tennessee Department of Transportation (TDOT), *Standard Specifications for Road and Bridge Construction,* January 1, 2021.

United States Environmental Protection Agency (EPA), *Clarification to the 2006 Joint EPA/FHWA Transportation Conformity Guidance for Qualitative Hot-spot Analysis in PM2.5 and PM10 Nonattainment and Maintenance Areas*, 2009.

United States Environmental Protection Agency (EPA), *Official Release of the MOVES5 Motor Vehicle Emissions Model for SIPs and Transportation Conformity*, December 11, 2024.

United States Environmental Protection Agency (EPA), *Official Release of the MOVES4 Motor Vehicle Emissions Model for SIPs and Transportation Conformity*, September 12, 2023.

United States Environmental Protection Agency (EPA), *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas*, October 2021.

United States Environmental Protection Agency (EPA), *Transportation Regulations,* April 2012.

TABLES

Table 1: Design Year VMT Projection on Affected Roadway Network

Alternative	**Year 2049 VMT**
No-Build	16,044
Build	16,044
Change	0

FIGURES

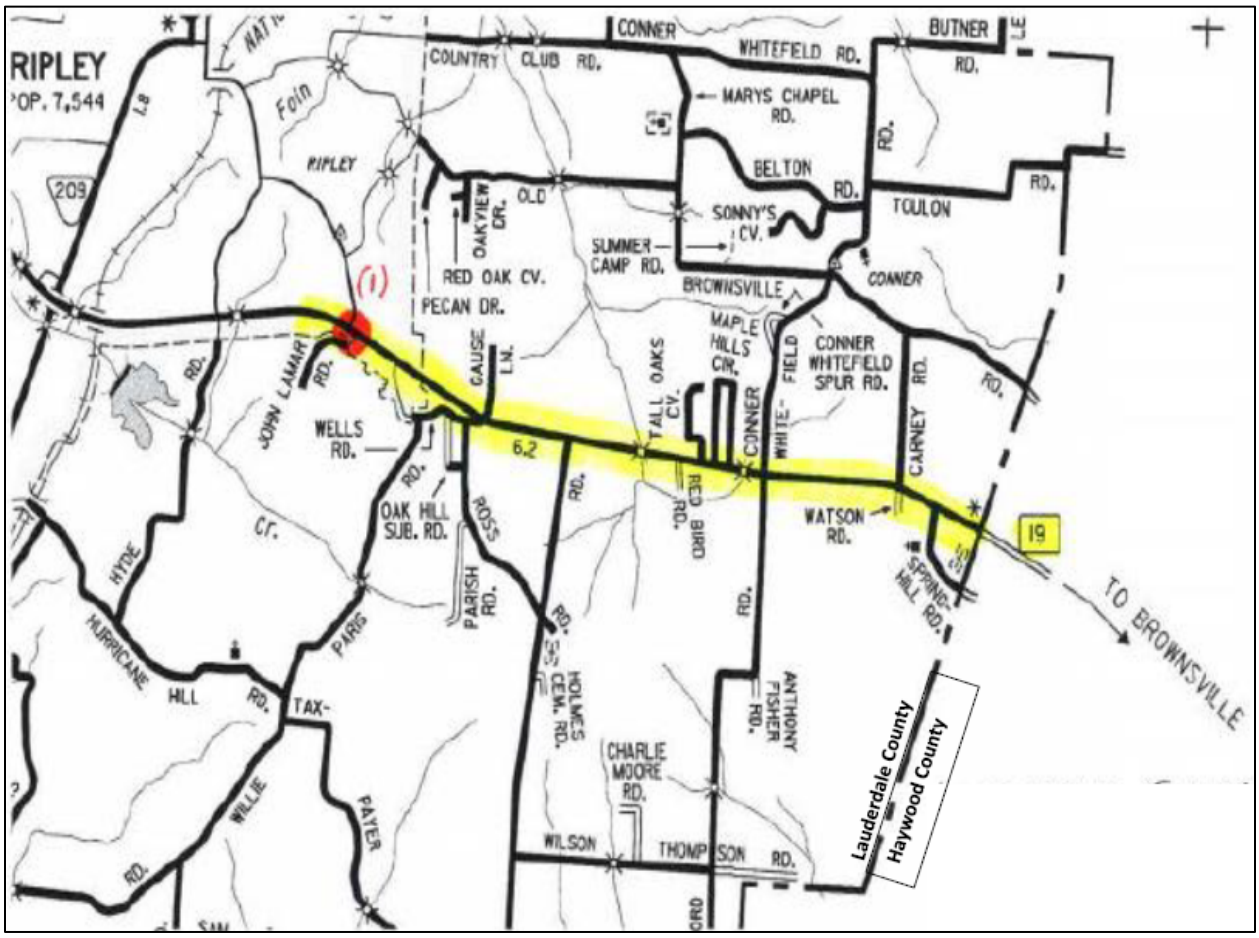


Figure 1: First Segment of the Project, Eastland Avenue to Haywood County Line

APPENDICES

Appendix A

Traffic Projections

TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION

PROJECT NO.: STP-19(54) : 49005-1228-14 ROUTE: S.R. 19
COUNTY: LAUDERDALE CITY:
PROJECT PIN NUMBER: 102251.01
PROJECT DESCRIPTION: FROM EASTLAND AVE. TO THE HAYWOOD COUNTY LINE.

[1] S.R. 19 AVERAGE TRAFFIC DATA

DIVISION REQUESTING:

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

YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: 2029
PROJECTED LETTING DATE: 2029

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]	3,350	2029	3,820	420	11	2049	65-35	4	6	144	217

REQUESTED BY: NAME DAVID DUNCAN DATE 3/8/24
DIVISION S.T.I.D.
ADDRESS 1000 J, K, POLK BUILDING
NASHVILLE TN 37243

REVIEWED BY: RANDY BOGUSKIE Randy Boguskie DATE 3/11/2024
TRANSPORTATION MANAGER 1
SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: TONY ARMSTRONG Tony Armstrong DATE 3/11/2024
TRANSPORTATION MANAGER 2
SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

FURNISH THE 2029-2049 TRAFFIC DATA AND ADL's FOR A TWO LANE ROADWAY.

THIS TRAFFIC UPDATES THE PREVIOUS PROJECT PREPARED FOR DESIGN DATED 9/1/2021 AND IS BASED ON 2023 CYCLE COUNTS. THE DESIGN YEAR TRAFFIC IS BASED ON GROWTH RATE FROM THE TN-TIMES LINEAR REGRESSION TOOL. AADT's, DHV's AND ADL's ARE INCLUDED.

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. 6/9/21)

TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION

PROJECT NO.: STP-19(54) : 49005-1228-14 ROUTE NO.: S.R. 19
COUNTY: LAUDERDALE CITY:
PROJECT DESCRIPTION: FROM EASTLAND AVE. TO THE HAYWOOD COUNTY LINE

FAP Rural

Pavement Structural Design

Calculation of Equivalent Daily 18 Kip Single Axle Loads

Type Vehicle		ADT (No. Counted)	Flexible 18-kip Factor	Flexible ADL	Rigid 18-kip Factor	Rigid ADL
Pass. cars and motorcycles (1-2)		2,417	0.001	2	0.001	2
Pick-up, Panel, Van (3)		950	0.005	5	0.004	4
Sing. Unit	Buses (4)	2	0.300	1	0.300	1
	2-axle, 6-tire (5)	21	0.240	5	0.310	7
	3-axle or more (6-7)	56	1.700	95	2.300	129
Comb.	4-axle (8)	21	1.110	23	1.500	32
	5-axle or more (9-13)	118	1.320	156	2.200	260
Totals (2039 AADT)		3,585		287		433

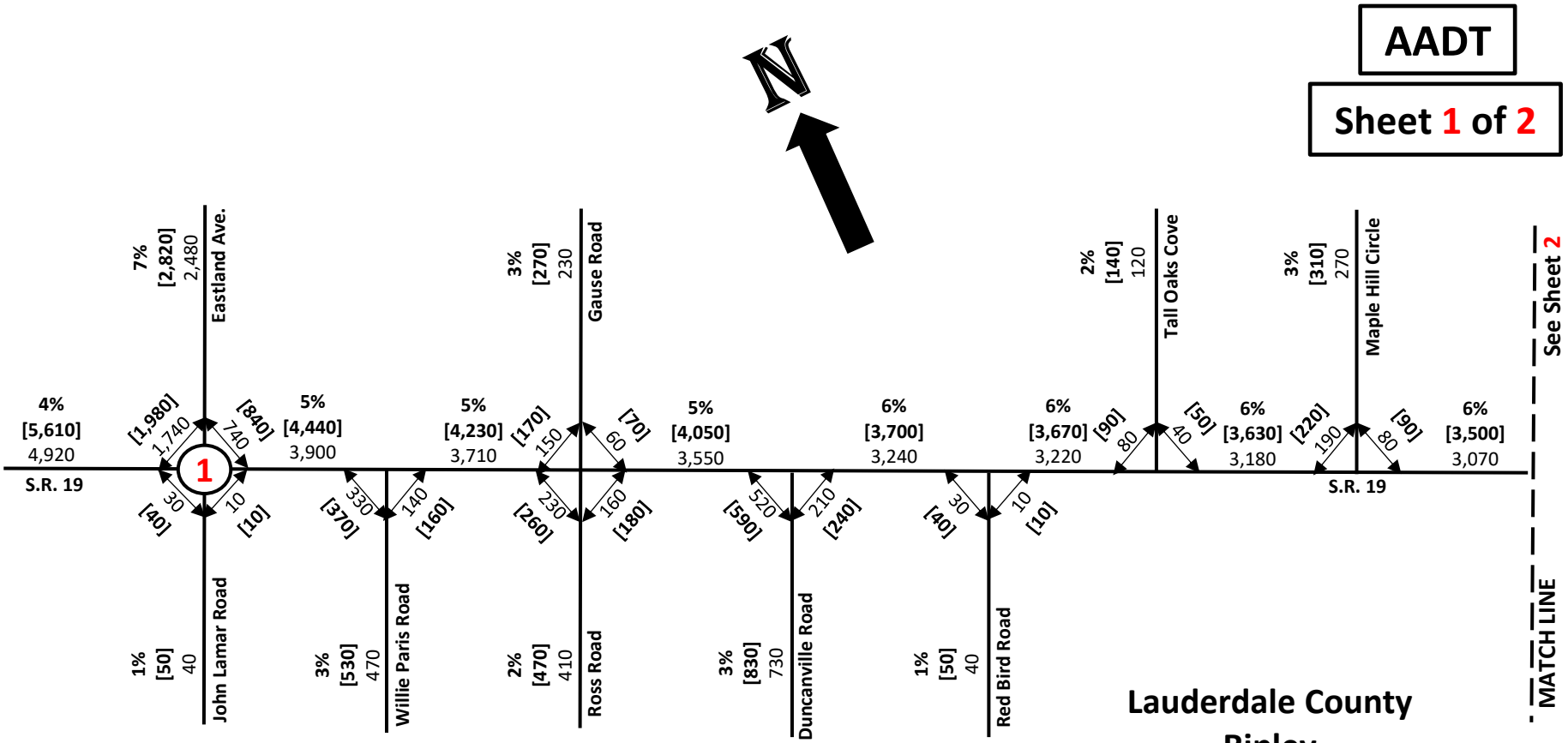
Suggested Percentages of Trucks in Design Lane

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	287.1	=	144
RIGID:	0.5	X	1.00	X	433.2	=	217

ADL Calculations By: RANDY BOGUSKIE Date: 3/11/2024
Reviewed By: Tony Armstrong Date: 3/11/2024
[REV. 7/1/14]



Lauderdale County
Ripley
S.R. 19

Legend:

2029 AADT - 000

2049 AADT - [000]

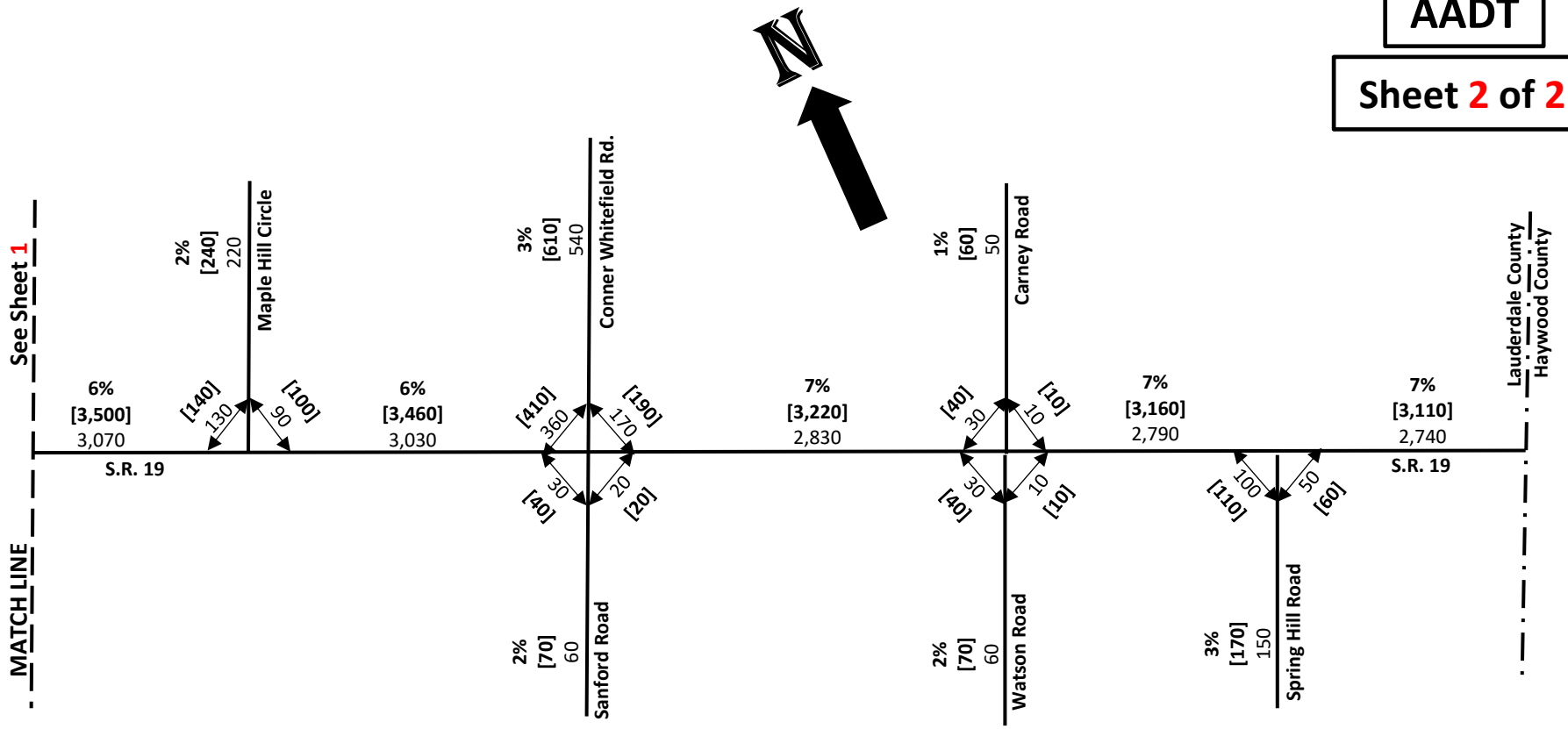
AADT Truck % - **0%**

Date: March 11, 2024

TA

AADT

Sheet 2 of 2



Lauderdale County

Ripley

S.R. 19

Legend:

2029 AADT - 000

2049 AADT - [000]

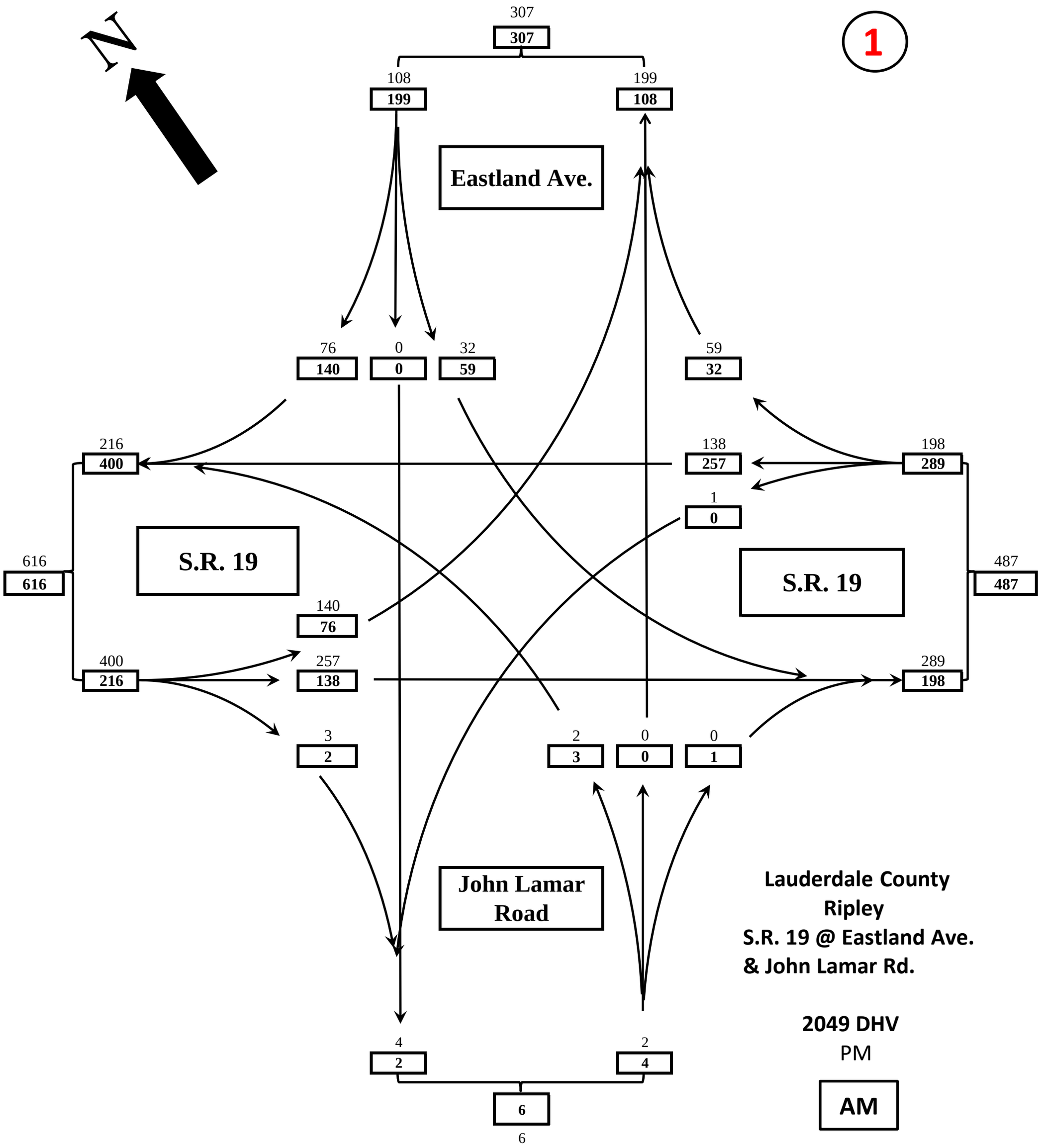
AADT Truck % - **0%**

Date: March 11, 2024

TA

2049 DHV

1



Lauderdale County
Ripley
S.R. 19 @ Eastland Ave.
& John Lamar Rd.

2049 DHV
PM

AM

Date: March 11, 2024
TA

Appendix B

FHWA MSATs Background Information January 2023

MOBILE SOURCE AIR TOXICS (MSAT)

Background

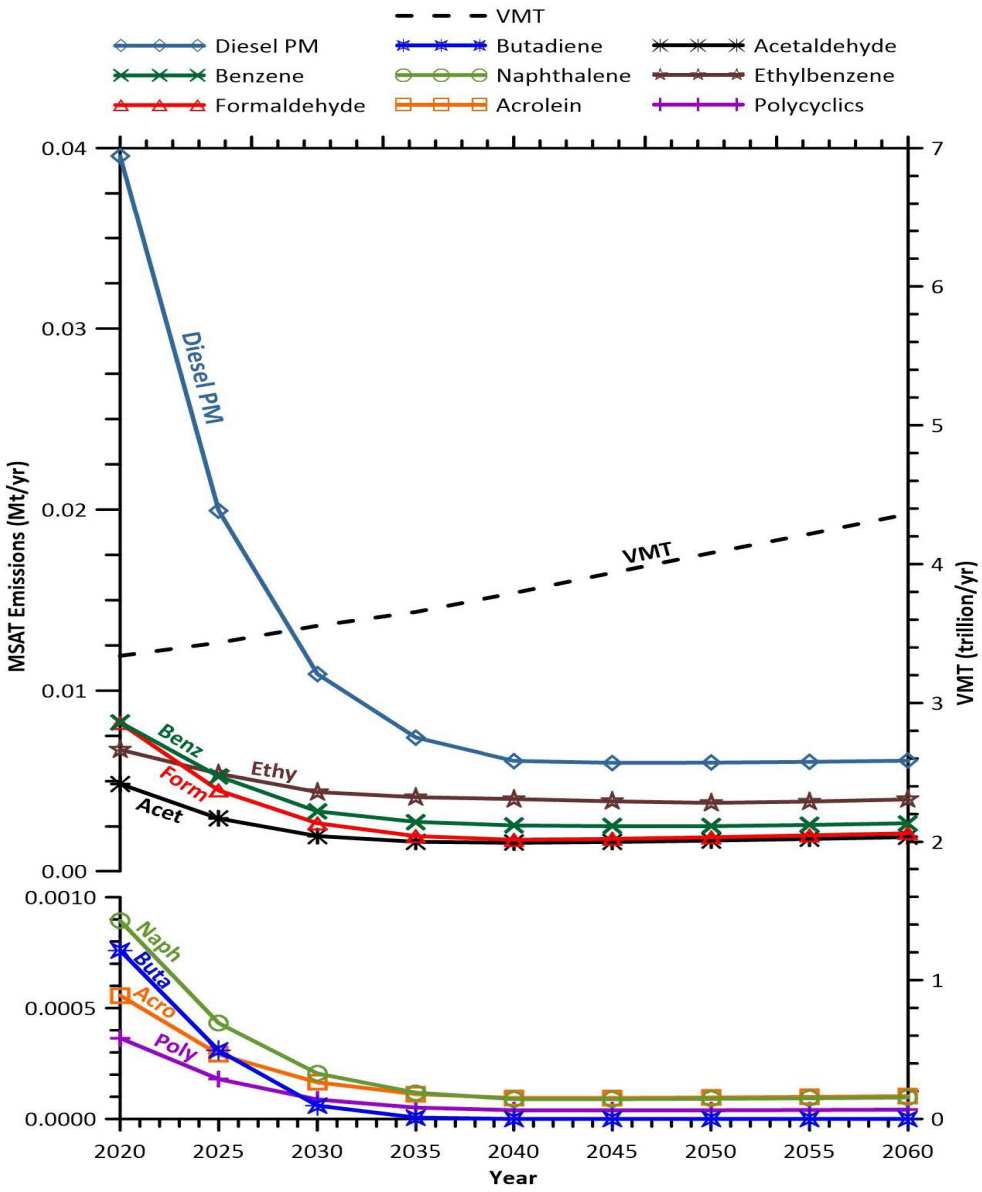
Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA assessed this expansive list in its rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are part of EPA's Integrated Risk Information System (IRIS). In addition, EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA). These are *1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter.* While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

Motor Vehicle Emissions Simulator (MOVES)

According to EPA, MOVES3 is a major revision to MOVES2014 and improves upon it in many respects. MOVES3 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activity developed since the release of MOVES2014. These new emissions data are for light- and heavy-duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES3 also adds updated vehicle sales, population, age distribution, and vehicle miles travelled (VMT) data. In November 2020 EPA issued MOVES3 Mobile Source Emissions Model Questions and Answers. EPA states that for on-road emissions, MOVES3 updated heavy-duty (HD) diesel and compressed natural gas (CNG) emission running rates and updated HD gasoline emission rates. They updated light-duty (LD) emission rates for hydrocarbon (HC), carbon monoxide (CO) and nitrogen oxide (NOx) and updated light-duty (LD) particulate matter rates, incorporating new data on Gasoline Direct Injection (GDI) vehicles.

Using EPA's MOVES3 model, as shown below and in Figure 1 of the FHWA Interim Guidance, FHWA estimates that even if VMT increases by 31 percent from 2020 to 2060 as forecast, a combined reduction of 76 percent in the total annual emissions for the priority MSAT is projected for the same time period.

FHWA PROJECTED NATIONAL MSAT EMISSION TRENDS 2020 – 2060
FOR VEHICLES OPERATING ON ROADWAYS



Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.

Source: EPA MOVES3 model runs conducted by FHWA, March 2021.

Diesel PM is the dominant component of MSAT emissions, making up 36 to 56 percent of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES3 will notice some differences in emissions compared with MOVES2014. MOVES3 is based on updated data on some emissions and pollutant processes compared to MOVES2014, and also reflects the latest Federal emissions standards in place at the time of its release. In addition, MOVES3 emissions forecasts are based on slightly higher VMT projections than MOVES2014, consistent with nationwide VMT trends.

MSAT Research

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

Nonetheless, air toxics concerns continue to arise on highway projects during the NEPA process. Even as the science emerges, the public and other agencies expect FHWA to address MSAT impacts in its environmental documents. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

NEPA Context

The NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the Federal Government be interpreted and administered per its environmental protection goals, and that Federal agencies use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment (42 U.S.C. 4332). In addition to evaluating the potential environmental effects, FHWA must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest (23 U.S.C. 109(h)). The FHWA policies and procedures for implementing NEPA are contained in regulation at 23 CFR Part 771.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in mobile source air toxic (MSAT) emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process

through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations for hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, https://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Several HEI studies are summarized in Appendix D of FHWA's Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects) or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then a final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways to determine the portion of time that people are exposed at a specific location and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-criticalreview-literature-exposure-and-health-effects). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA states that concerning diesel engine exhaust, "[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk (https://www.epa.gov/iris)."

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable (https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD5985257800050C9DA/$file/07-1053-1120274.pdf).

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis

Air Quality Technical Report
for
State Route 19 from near Lauderdale County Line to east of State Route 87

Haywood County, Tennessee

PIN Numbers: 102251.02 and 102251.03

Submitted to:

TN TDOT Department of Transportation

Prepared by:

Stantec Consulting Services, Inc.

Stantec

May 2025

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FIGURES

APPENDICES

Executive Summary

The air quality evaluation was conducted per the Tennessee Department of Transportation (TDOT) *Tennessee Environmental Procedures Manual* (TDOT, 2011).

The purposes of this analysis are to address the transportation conformity requirements for the project, the potential Mobile Source Air Toxics (MSATs) effects, and construction air quality.

The evaluation concluded that this project is located in Haywood County, which is in attainment for all regulated transportation-related criteria pollutants. Therefore, conformity does not apply to this project. Additionally, travel speeds for the Build Alternative are expected to be higher than for the No-Build Alternative which will reduce emissions by increasing speeds; according to EPA's MOVES5 model, emissions of all the priority MSAT pollutants decrease as speed increases.

1.0 Introduction

This report summarizes the results of an analysis of the potential air quality effects of the proposed project to improve road conditions along State Route (SR) 19 from east of Eastland Avenue in Lauderdale County to east of SR 87 in Haywood County. The project will include widening and spot improvements at various locations along the corridor. Due to the size of improvements to the corridor, the TDOT has split this project into three segments. The first segment of roadway spans from Eastland Avenue to the Haywood County line, the second segment of roadway spans from the Lauderdale County line to Binford Lane, and the third segment of roadway spans form Binford Lane to State Route 87.

The SR 19 corridor provides a critical connection from Ripley, Tennessee, to Brownsville along Interstate 40; additionally, traffic along this corridor is projected to increase due to additional development at and around the Memphis Regional Megasite. Additionally, this segment of SR 19 is a proposed bicycle route in the Tennessee State Bicycle Route System. Expansion of the existing roadway and shoulders will significantly improve the level of service for bicycles. The planned alignment for SR-19 along a portion of the project corridor is a "Super Two-Lane" typical section, which includes one 12-foot travel lane in each direction and 10-foot outside shoulders. A Super Two-Lane design provides operational, and safety benefits compared to a traditional two-lane roadway, especially for freight traffic, while remaining more cost-efficient than a wider alignment. This report will focus on the second and third segments of the project, which are located in Haywood County. The second segment of the project will span from the Lauderdale County Line to Binford Lane and the third segment of the project will span from Binford Lane to SR-87.

The project area is shown in Figure 1.

2.0 Air Quality Evaluation

The air quality evaluation was conducted per TDOT's *Tennessee Environmental Procedures Manual* (TDOT 2011).

The purposes of this analysis are to address the transportation conformity requirements for the project as well as the potential Mobile Source Air Toxics (MSAT) effects.

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This project is in Haywood County which is in attainment for all regulated transportation-related criteria pollutants.

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Transportation conformity is a process required of Metropolitan Planning Organizations (MPOs) under the CAAA of 1990. CAAA requires that transportation plans, programs, and projects in nonattainment or maintenance areas that are funded or approved by the Federal Highway Administration (FHWA) conform to the State Implementation Plan (SIP), which represents the state's plan to either achieve or maintain the NAAQS for a particular pollutant.

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This project is located in Haywood County, which is in attainment for all regulated transportation-related criteria pollutants. Therefore, conformity does not apply to this project.

2.3 Mobile Source Air Toxics

On February 3, 2006, the FHWA released "*Interim Guidance on Air Toxic Analysis in NEPA Documents.*" This guidance was superseded on September 30, 2009, December 6, 2012, October 16, 2016, and most recently on January 23, 2023, by FHWA's "*Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents.*" (FHWA 2023). The purpose of FHWA's guidance is to advise on when and how to analyze Mobile Source Air Toxics (MSAT) in the NEPA process for highways. This guidance is interim, because MSAT science is still evolving. As science progresses, FHWA will continue to revise and update the guidance.
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- Projects with Low Potential MSAT Effects; and
- Projects with Higher Potential MSAT Effects.

FHWA's Updated Interim Guidance provides examples of "Projects with Low Potential MSAT Effects." These projects include minor widening projects and new interchanges, such as those that replace a signalized intersection on a surface street, or where design year traffic projections are less than 140,000 to 150,000 average annual daily traffic (AADT).

The Build Alternative includes improvements to SR-19 in Lauderdale and Haywood counties, including widening and spot improvements at various locations along the corridor. The entire project stretches from east of Eastland Avenue in Lauderdale County to east of SR 87 in Haywood County. The planned alignment for SR-19 along a portion of the project corridor is a "Super Two-Lane" typical section, which includes one 12-foot travel lane in each direction and 10-foot outside shoulders. This second segment of this project will span from Lauderdale County Line to Binford Lane and incorporate widening SR-19 to a Super Two-Lane Road from the Lauderdale County Line to near Gil Bracken Road, which includes passing lanes in both directions. From Gil Bracken Road to Binford Lane, the project will focus on resurfacing the existing road and constructing intersection improvements. The third segment of the project will span from Binford Lane to SR-87, which includes passing lanes, intersection improvements, resurfacing the existing road, as well as improvements to the slope in high-crash areas.

The highest projected design year 2049 AADT on SR-19 for the second segment of the project spanning from Lauderdale County Line to Binford Lane is 3,230 vehicles per day and substantially lower than the FHWA criterion. The highest projected design year 2049 AADT on SR 19 for the third segment of the project spanning from Binford Lane to SR-87 is 3,690 vehicles per day and substantially lower than the FHWA criterion. Therefore, both segments of the project meet the criteria for a "Project with Low Potential MSAT Effects."

For both the Build and No-Build Alternatives, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. As shown, the projected VMT for the No-Build Alternative is 26,163 miles and the projected VMT for the Build Alternative is 26,163 for the second segment. The projected VMT for the No-Build Alternative is 25,461 miles and the projected VMT for the Build Alternative is 25,461 for the second segment. Therefore, it is expected that the project will cause no change in overall MSAT emissions.

The project may also reduce emissions by increasing speeds; according to EPA's MOVES model, emissions of all the priority MSAT decrease as speed increases (FHWA, Appendix B). Travel speeds for the Build Alternative are expected to be higher than for the No-Build Alternative.

In sum, reduced MSAT emissions are expected in the immediate project area under the Build Alternative in the 2049 design year, relative to the No-Build Alternative for the second and third segments of the project. The reductions are due to major roadway changes to SR 19 allowing for traffic to move more freely and at greater speeds; thus, increasing efficiency of the roadway while decreasing MSAT. Additionally, EPA's vehicle and fuel regulations coupled with fleet turnover, will cause substantial reductions over time that, in almost all cases, will cause region wide MSAT levels to be significantly lower than today. Substantial construction related MSAT emissions are not anticipated for this project as construction is not planned to occur over an extended building period. However, construction activity may generate temporary increases in MSAT emissions in the project area.

2.4 Construction Air Quality

Construction activities will generate intermittent and temporary construction-related pollutant emissions and dust.

TDOT's construction specifications will apply to this project. Construction procedures should be governed by the *Standard Specifications for Road and Bridge Construction* as issued by TDOT and as amended by the most recent applicable supplements. All construction equipment shall be maintained, repaired, and adjusted to keep it in full satisfactory condition.

Additionally, there are no air quality monitoring stations close to the project. The closest station is a $PM_{2.5}$ monitoring system in Jackson Tennessee approximately 26 miles northeast from the second segment and 24 miles northeast from the third segment of the project.

3.0 Conclusions

The purpose of the improvements to SR-19 is to increase vehicle capacity on the existing SR 19 corridor to meet future traffic demands; Provide an improved Level of Service (LOS) for motorists and truck traffic; and alleviate traffic congestion during peak hours, particularly for commuters. These segments of the project are located in Haywood County, which is in attainment for all regulated transportation-related criteria pollutants. Therefore, conformity does not apply to this project. Additionally, travel speeds for the Build Alternative are expected to be higher than for the No-Build Alternative which will reduce emissions by increasing speeds; according to EPA's MOVES model, emissions of all the priority MSAT decrease as speed increases.

4.0 References

Claggett, M., et. al., "*A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives,"* Federal Highway Administration Resource Center, May 4, 2006.

Council on Environmental Quality (CEQ), *Update to the Regulations Implementing the National Environmental Policy Act*, May 1, 2024.

Federal Highway Administration (FHWA), *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents*, January 18, 2023.

Federal Highway Administration (FHWA), *Vulnerability Assessment and Adaptation Framework, Third Edition, FHWA-HEP-18-020*, December 2017.

Tennessee Department of Transportation (TDOT), *Tennessee Environmental Procedures Manual*, June 2011.

Tennessee Department of Transportation (TDOT), *Standard Specifications for Road and Bridge Construction,* January 1, 2021.

United States Environmental Protection Agency (EPA), *Clarification to the 2006 Joint EPA/FHWA Transportation Conformity Guidance for Qualitative Hot-spot Analysis in PM2.5 and PM10 Nonattainment and Maintenance Areas*, 2009.

United States Environmental Protection Agency (EPA), *Official Release of the MOVES5 Motor Vehicle Emissions Model for SIPs and Transportation Conformity*, December 11, 2024.

United States Environmental Protection Agency (EPA), *Official Release of the MOVES4 Motor Vehicle Emissions Model for SIPs and Transportation Conformity*, September 12, 2023.

United States Environmental Protection Agency (EPA), *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas*, October 2021.

United States Environmental Protection Agency (EPA), *Transportation Regulations,* April 2012.

TABLES

Table 1: Design Year VMT Projection on Affected Roadway Network for the Second and Third Segments of the Project

Alternative	**Year 2049 VMT**
No-Build for Second Segment (102251.02)	26,163
Build for Second Segment (102251.02)	26,163
No-Build for Third Segment (102251.03)	25,460
Build for Third Segment (102251.03)	25,460
Change for Second Segment (102251.02)	0
Change for Third Segment (102251.03)	0

FIGURES

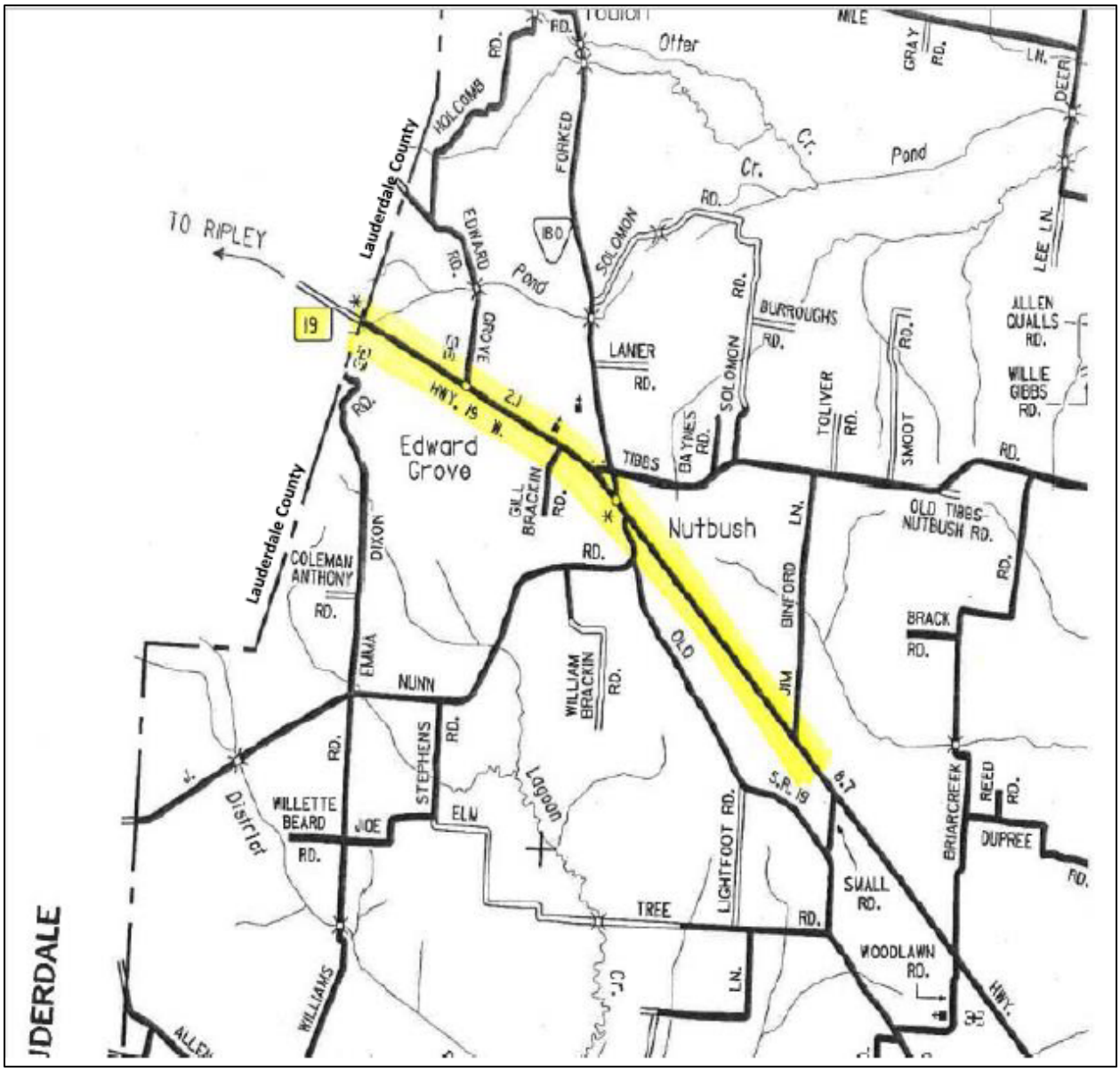


Figure 1: Second Segment on the Project, From Lauderdale County Line to East of Jim Binford Lane

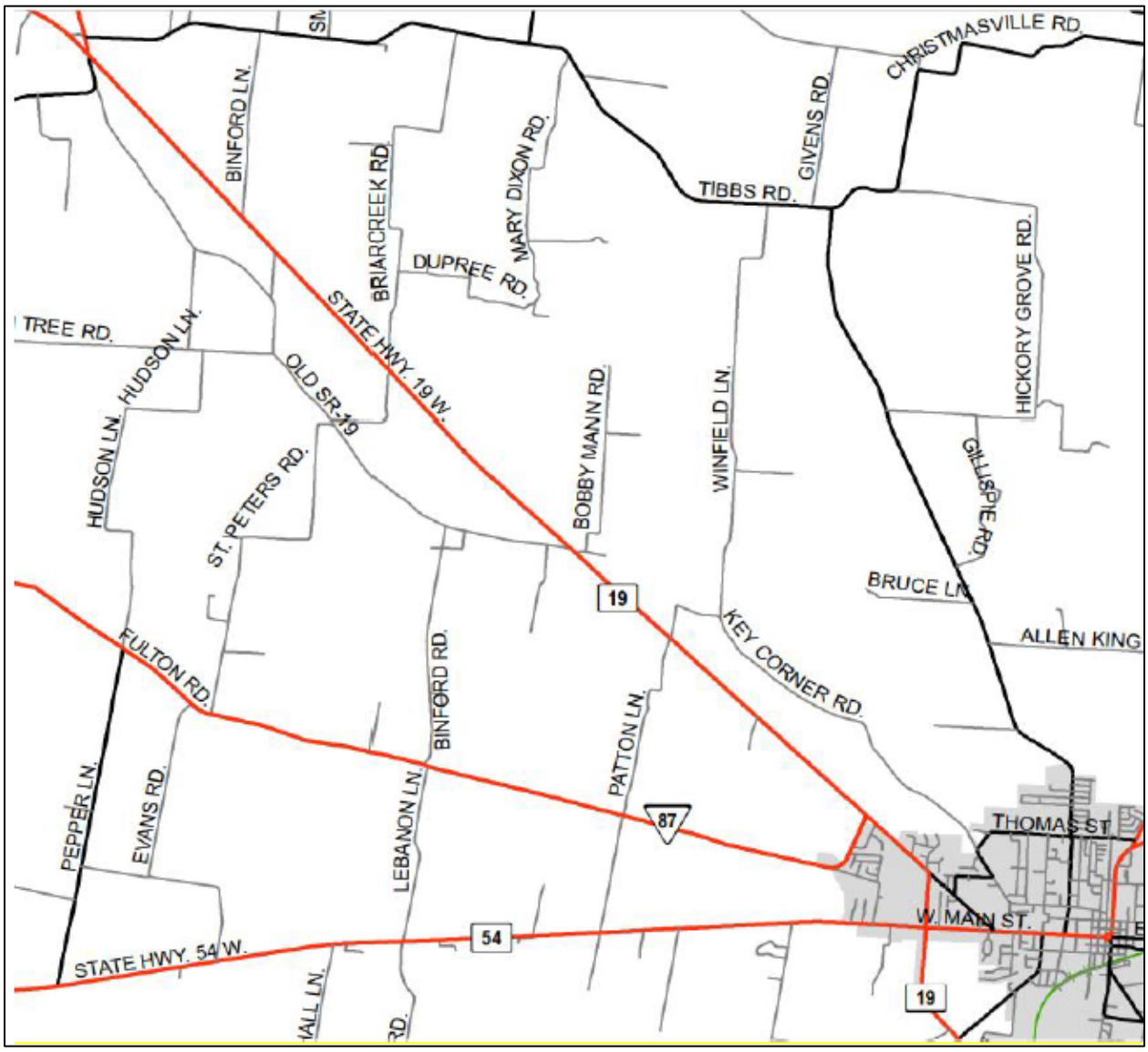


Figure 2: Third Segment of the Project, From East of Binford Lane to SR-87

APPENDICES

Appendix A

Traffic Projections

TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION

PROJECT NO.: STP-19(55) : 38004-1219-14 ROUTE: S.R. 19
COUNTY: HAYWOOD CITY: NUTBUSH
PROJECT PIN NUMBER: 102251.02
PROJECT DESCRIPTION: FROM THE LAUDERDALE COUNTY LINE TO EAST OF JIM BINFORD LANE

[1] S.R. 19 AVERAGE 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	☐

YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: 2029
PROJECTED LETTING DATE: 2029

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]	2,860	2029	3,230	355	11	2049	65-35	5	7	139	211

REQUESTED BY: NAME DAVID DUNCAN DATE 3/8/24
DIVISION S.T.I.D.
ADDRESS 1000 J, K, POLK BUILDING
NASHVILLE TN 37243

REVIEWED BY: RANDY BOGUSKIE Randy Boguskie DATE 3/11/2024
TRANSPORTATION MANAGER 1
SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: TONY ARMSTRONG Tony Armstrong DATE 3/11/2024
TRANSPORTATION MANAGER 2
SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

FURNISH THE 2029-2040 TRAFFIC DATA AND ADL's FOR A TWO LANE ROADWAY.

THIS TRAFFIC UPDATES THE PREVIOUS PROJECT PREPARED FOR DESIGN DATED 9/1/2021 AND IS BASED ON 2023 CYCLE COUNTS. THE DESIGN YEAR TRAFFIC IS BASED ON GROWTH RATE FROM THE TN-TIMES LINEAR REGRESSION TOOL. AADT's, DHV's AND ADL's ARE INCLUDED.

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. 6/9/21)

TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION

PROJECT NO.: STP-19(55) : 38004-1219-14 ROUTE NO.: S.R. 19
COUNTY: HAYWOOD CITY: NUTBUSH
PROJECT DESCRIPTION: FROM THE LAUDERDALE COUNTY LINE TO EAST OF JIM BINFORD LANE

FAP Rural

Pavement Structural Design

Calculation of Equivalent Daily 18 Kip Single Axle Loads

Type Vehicle		ADT (No. Counted)	Flexible 18-kip Factor	Flexible ADL	Rigid 18-kip Factor	Rigid ADL
Pass. cars and motorcycles (1-2)		2,025	0.001	2	0.001	2
Pick-up, Panel, Van (3)		807	0.005	4	0.004	3
Sing. Unit	Buses (4)	2	0.300	1	0.300	1
	2-axle, 6-tire (5)	21	0.240	5	0.310	7
	3-axle or more (6-7)	55	1.700	94	2.300	127
Comb.	4-axle (8)	21	1.110	23	1.500	32
	5-axle or more (9-13)	114	1.320	150	2.200	251
Totals (2039 AADT)		3,045		279		421

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	279.0	=	139
RIGID:	0.5	X	1.00	X	421.2	=	211

ADL Calculations By: Ashlie Bevan Date: 3/11/2024
Reviewed By: Randy Boguskie Date: 3/11/2024
[REV. 7/1/14]

TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION

PROJECT NO.: _____ ROUTE: S.R. 19
COUNTY: HAYWOOD CITY: BROWNSVILLE
PROJECT PIN NUMBER: 102251.03
PROJECT DESCRIPTION: FROM EAST OF JIM BINFORD LANE TO EAST OF S.R. 87.

[1] S.R. 19 AVERAGE TRAFFIC DATA

DIVISION REQUESTING:

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

YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: 2029
PROJECTED LETTING DATE: 2029

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]	3,220	2029	3,690	406	11	2049	65-35	4	6	137	207

REQUESTED BY: NAME DAVID DUNCAN DATE 3/8/24
DIVISION S.T.I.D.
ADDRESS 1000 J, K, POLK BUILDING
NASHVILLE TN 37243

REVIEWED BY: RANDY BOGUSKIE _____ DATE _____
TRANSPORTATION MANAGER 1
SUITE 1000, JAMES K. POLK BUILDING

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

COMMENTS:

FURNISH THE 2029-2049 TRAFFIC DATA AND ADL's FOR A TWO LANE ROADWAY.

THIS TRAFFIC UPDATES THE PREVIOUS PROJECT PREPARED FOR DESIGN DATED 8/29/2017 AND IS BASED ON 2023 CYCLE COUNTS. THE DESIGN YEAR TRAFFIC IS BASED ON GROWTH RATE FROM THE TN-TIMES LINEAR REGRESSION TOOL. AADT's, DHV's AND ADL's ARE INCLUDED.

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. 6/9/21)

TENNESSEE DEPARTMENT OF TRANSPORTATION
STRATEGIC TRANSPORTATION INVESTMENTS DIVISION

PROJECT NO.: _____ ROUTE NO.: S.R. 19
COUNTY: HAYWOOD CITY: BROWNSVILLE
PROJECT DESCRIPTION: FROM EAST OF JIM BINFORD LANE TO EAST OF S.R. 87

FAP Rural

Pavement Structural Design

Calculation of Equivalent Daily 18 Kip Single Axle Loads

Type Vehicle		ADT (No. Counted)	Flexible 18-kip Factor	Flexible ADL	Rigid 18-kip Factor	Rigid ADL
Pass. cars and motorcycles (1-2)		2,331	0.001	2	0.001	2
Pick-up, Panel, Van (3)		916	0.005	5	0.004	4
Sing. Unit	Buses (4)	2	0.300	1	0.300	1
	2-axle, 6-tire (5)	20	0.240	5	0.310	6
	3-axle or more (6-7)	53	1.700	90	2.300	122
Comb.	4-axle (8)	20	1.110	22	1.500	30
	5-axle or more (9-13)	113	1.320	149	2.200	249
Totals (2039 AADT)		3,455		274		413

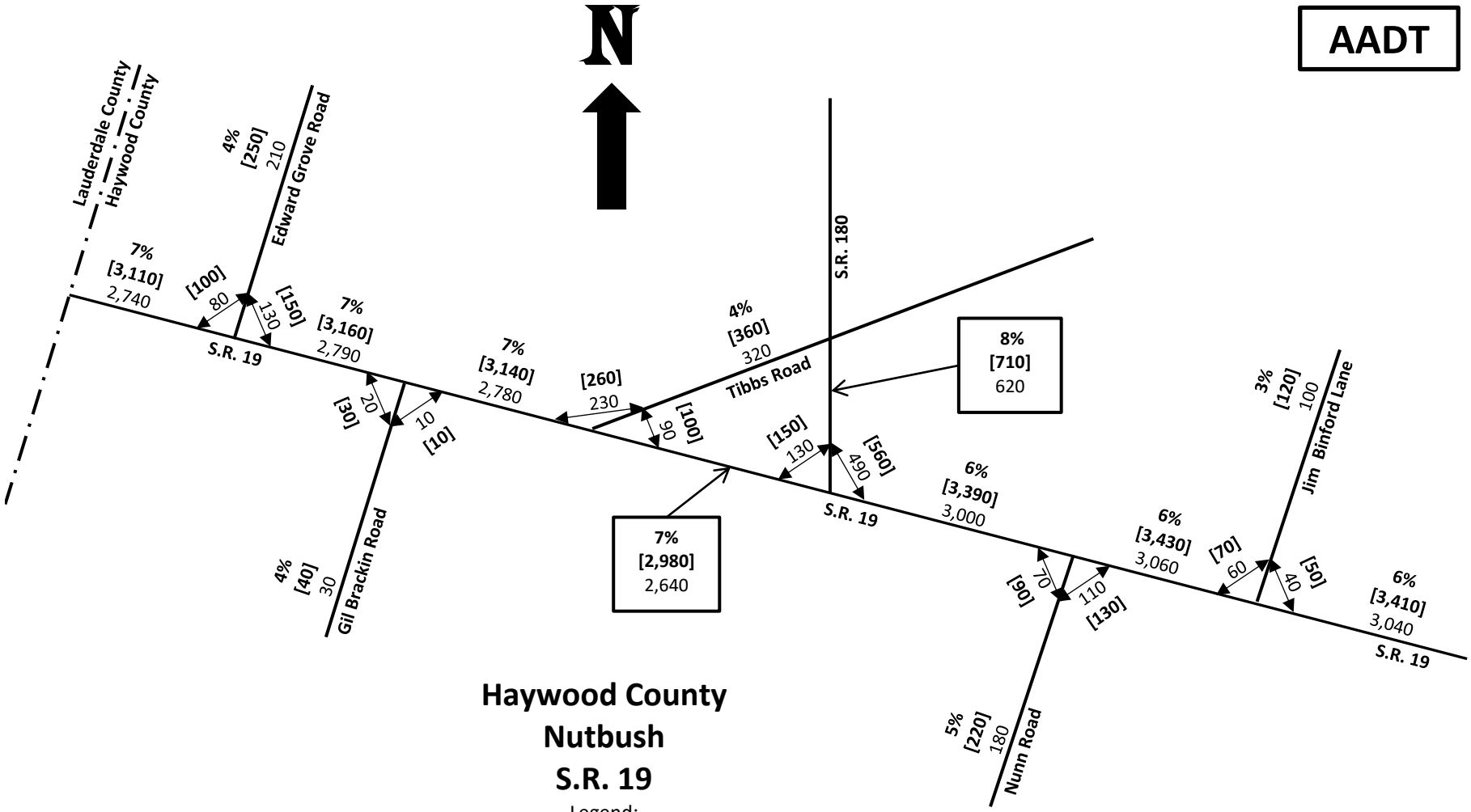
Suggested Percentages of Trucks in Design Lane

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	273.8	=	137
RIGID:	0.5	X	1.00	X	413.3	=	207

ADL Calculations By: TONY ATMSTRONG Date: 3/11/2024
Reviewed By: _____ Date: _____
[REV. 7/1/14]



Haywood County

Nutbush

S.R. 19

Legend:

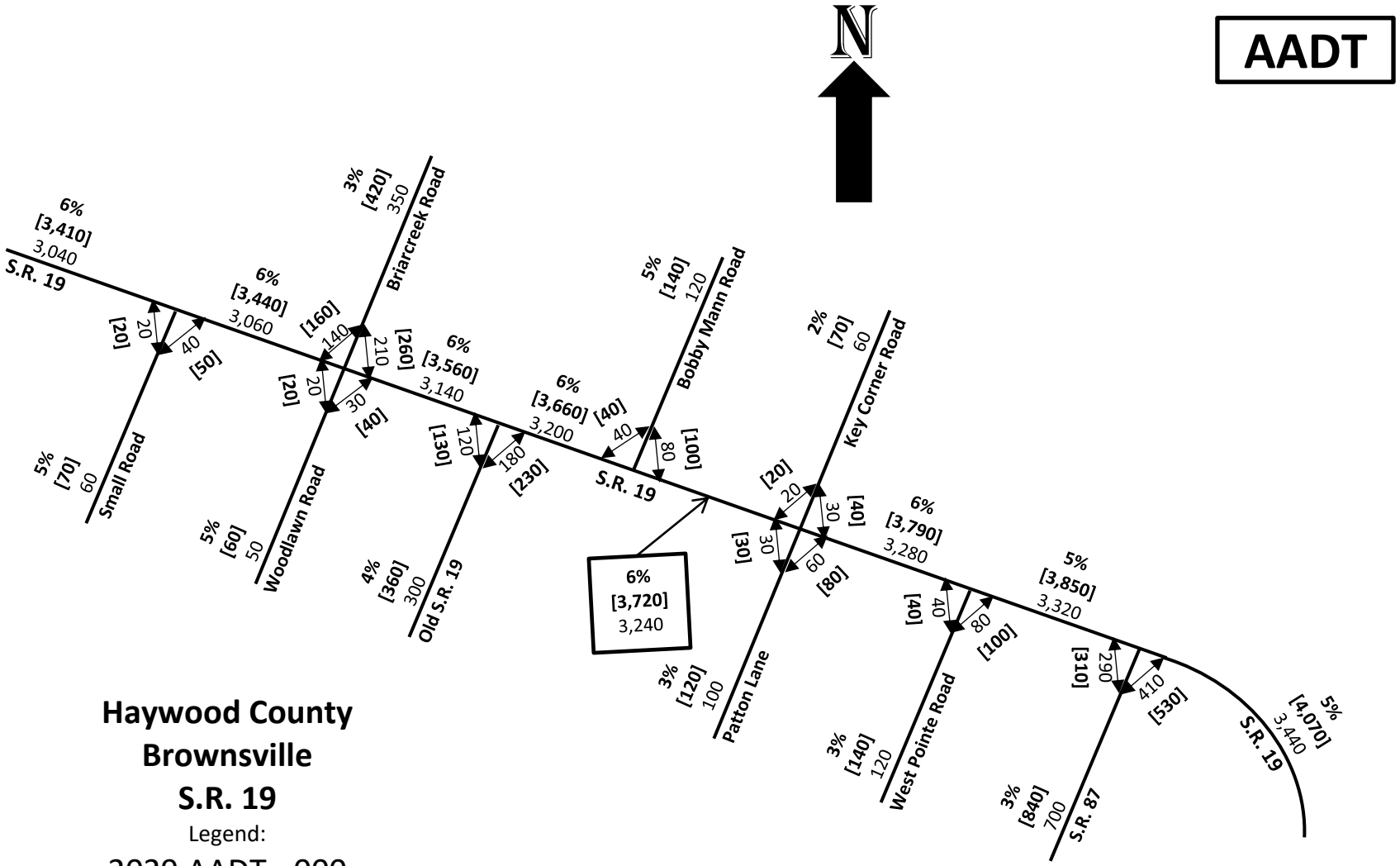
2029 AADT - 000

2049 AADT - [000]

AADT Truck % - **0%**

Date: March 11, 2024

TA



Haywood County

Brownsville

S.R. 19

Legend:

2029 AADT - 000

2049 AADT - [000]

AADT Truck % - **0%**

Date: March 11, 2024

TA

Appendix B

FHWA MSATs Background Information January 2023

MOBILE SOURCE AIR TOXICS (MSAT)

Background

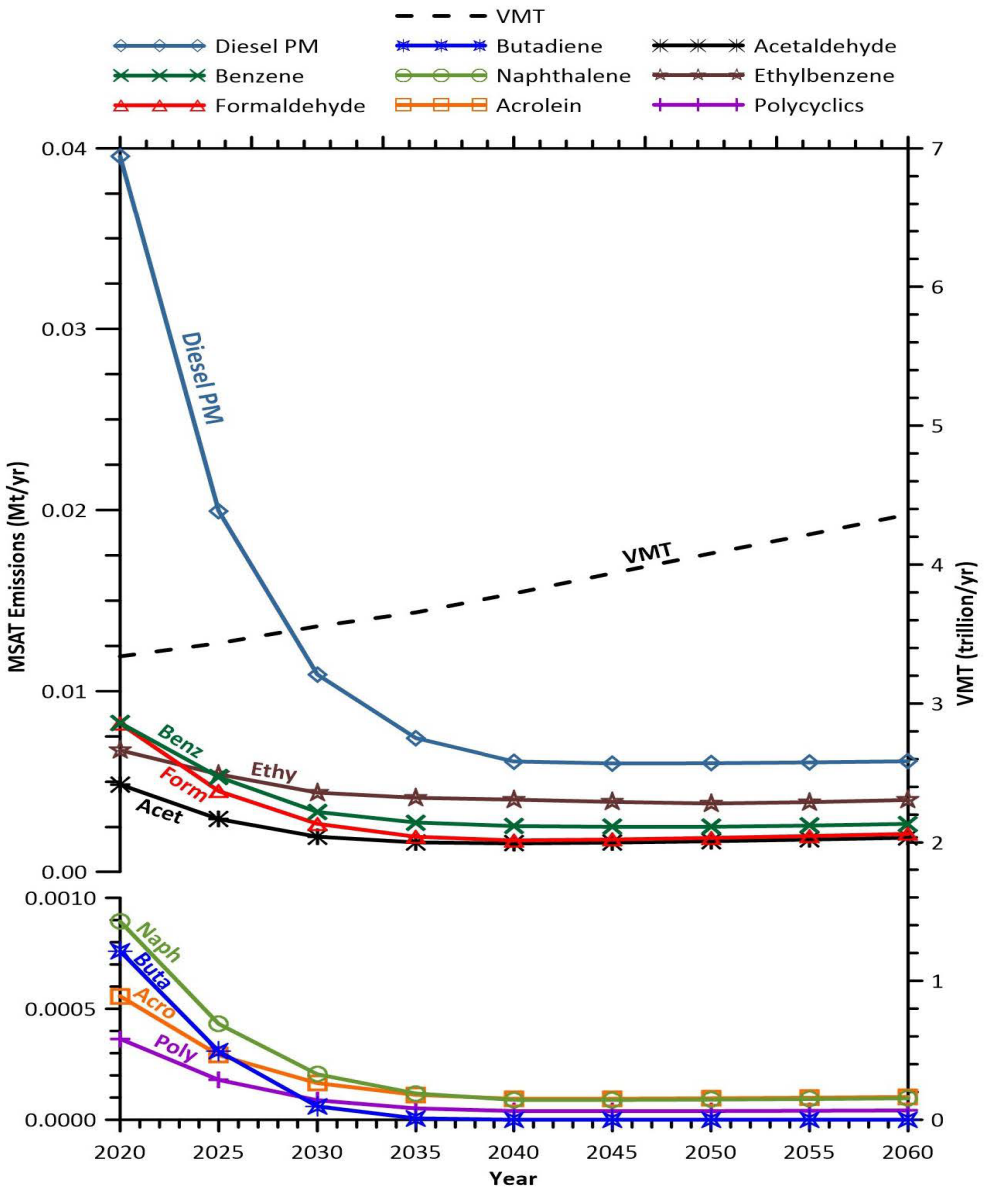
Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA assessed this expansive list in its rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are part of EPA's Integrated Risk Information System (IRIS). In addition, EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA). These are *1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter.* While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

Motor Vehicle Emissions Simulator (MOVES)

According to EPA, MOVES3 is a major revision to MOVES2014 and improves upon it in many respects. MOVES3 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activity developed since the release of MOVES2014. These new emissions data are for light- and heavy duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES3 also adds updated vehicle sales, population, age distribution, and vehicle miles travelled (VMT) data. In the November 2020 EPA issued MOVES3 Mobile Source Emissions Model Questions and Answers. EPA states that for on-road emissions, MOVES3 updated heavy-duty (HD) diesel and compressed natural gas (CNG) emission running rates and updated HD gasoline emission rates. They updated light-duty (LD) emission rates for hydrocarbon (HC), carbon monoxide (CO) and nitrogen oxide (NOx) and updated light-duty (LD) particulate matter rates, incorporating new data on Gasoline Direct Injection (GDI) vehicles.

Using EPA's MOVES3 model, as shown below and in Figure 1 of the FHWA Interim Guidance, FHWA estimates that even if VMT increases by 31 percent from 2020 to 2060 as forecast, a combined reduction of 76 percent in the total annual emissions for the priority MSAT is projected for the same time period.

FHWA PROJECTED NATIONAL MSAT EMISSION TRENDS 2020 – 2060
FOR VEHICLES OPERATING ON ROADWAYS



Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.

Source: EPA MOVES3 model runs conducted by FHWA, March 2021.

Diesel PM is the dominant component of MSAT emissions, making up 36 to 56 percent of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES3 will notice some differences in emissions compared with MOVES2014. MOVES3 is based on updated data on some emissions and pollutant processes compared to MOVES2014, and also reflects the latest Federal emissions standards in place at the time of its release. In addition, MOVES3 emissions forecasts are based on slightly higher VMT projections than MOVES2014, consistent with nationwide VMT trends.

MSAT Research

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

Nonetheless, air toxics concerns continue to arise on highway projects during the NEPA process. Even as the science emerges, the public and other agencies expect FHWA to address MSAT impacts in its environmental documents. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

NEPA Context

The NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the Federal Government be interpreted and administered per its environmental protection goals, and that Federal agencies use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment (42 U.S.C. 4332). In addition to evaluating the potential environmental effects, FHWA must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest (23 U.S.C. 109(h)). The FHWA policies and procedures for implementing NEPA are contained in regulation at 23 CFR Part 771.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in mobile source air toxic (MSAT) emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations for hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, https://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Several HEI studies are summarized in Appendix D of FHWA's Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects) or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then a final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways to determine the portion of time that people are exposed at a specific location and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-

criticalreview-literature-exposure-and-health-effects). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA states that concerning diesel engine exhaust, "[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk (https://www.epa.gov/iris)."

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable (https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD5985257800005 0C9DA/$file/07-1053-1120274.pdf).

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis