ADDENDUM

TRAFFIC NOISE TECHNICAL MEMORANDUM

For

ADMINISTRATIVE ACTION

ENVIRONMENTAL IMPACT STATEMENT

Monroe Connector/Bypass
Union and Mecklenburg Counties

STIP Project Nos. R-3329 and R-2559

Prepared for:

NORTH CAROLINA
Turnpike Authority

Prepared by:

PBS&J

1616 East Millbrook Road
Raleigh, NC 27609

January 2010

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1.0 Introduction

In March 2009, a Draft Environmental Impact Statement (Draft EIS) was published for the Monroe Connector/Bypass project in Union and Mecklenburg counties. A noise study was prepared for all Detailed Study Alternatives (DSA) as part of the Draft EIS. It is documented in *Traffic Noise Technical Memorandum for Administrative Action Environmental Impact Statement Monroe Bypass* (March 2009), referred to here as the *March 2009 Traffic Noise Technical Memorandum*. Since that time a Preferred Alternative has been selected (DSA D), design modifications have been made, and projected traffic volumes have been updated. Figure 1a-1c shows the Detailed Study Alternatives originally considered with the Preferred Alternative highlighted.

As a result of design changes and revisions to 2035 traffic projections along the Preferred Alternative alignment, this addendum to the *March 2009 Traffic Noise Technical Memorandum* has been prepared. Previous analysis has been updated to include the revised design information and updated traffic volumes. Areas that were re-examined in this addendum included neighborhoods that are experiencing ongoing construction, including: Forest Park, Acorn Woods, Bonterra Village, Suburban Estates, Winward Oaks, College Park as well as other areas potentially affected by the modified alignment or changes in the projected traffic.

2.0 Modifications to Alignment

Post-Draft EIS modifications to the proposed alignment of the Preferred Alternative (DSA D) include the following:

- Re-aligned ramps along Segment 2, affecting noise analysis in the Barrier Evaluation Areas (BEAs) N1 and N2.
- Cul-de-sac of Beverly Drive north and south of the Monroe Connector/Bypass in Segment 2 and Segment 21 affecting noise analysis in BEA N4 (Acorn Woods).
- A new interchange design at the Unionville-Indian Trail/Monroe Connector/Bypass, which affected the noise analysis in Segment 21 and Segment 30 in BEA N5 (Bonterra and Suburban Estates).
- Relocation of the westbound off-ramp and loop on-ramp from the east side of Austin Chaney Road to the west side of Austin Chaney Road, neighborhoods (Windward Oaks and College Park). Because this area was not impacted by the previous design it did not warrant analysis in the *March 2009 Traffic Noise Technical Memorandum* and therefore was not assigned a BEA number.

3.0 Incorporation of New Traffic Forecasts

Since the time when the original traffic operations technical memorandum was completed, a revised toll collection plan was developed for the Monroe Connector/Bypass / US 74 Frontage Road interchange (*Final: Addendum to Year 2035 Build Traffic Operations Technical Memorandum, November 2009*). The new toll collection plan altered the traffic patterns within this area, requiring a new traffic forecast to be

developed. The original traffic projections used in the traffic operations technical memorandum were developed by Wilbur Smith and Associates using data from a Metrolina Regional Travel Demand Model.

Analysis of noise impacts were reassessed based on revised traffic volumes for Segment 2 of the Preferred Alternative. Revised traffic volumes used in the analysis are provided in **Appendix A**.

4.0 Identification of New Receptors

New building permits issued since the *March 2009 Traffic Noise Technical Memorandum* have been identified and considered, and additional noise modeling using the Federal Highway Administration's (FHWA) Traffic Noise Model Version 2.5 (TNM) has been performed to identify potential new noise impacts and modifications to noise barriers. A search for building permits issued since the *March 2009 Traffic Noise Technical Memorandum* was conducted by the Union County Inspection and Zoning Department (as of November 2, 2009). A total of 1,165 new permits were identified in the county. Consistent with the methodology of the original technical memorandum, the proximity of these newly permitted structures to the 60 dBA noise contour were investigated. None of the newly permitted structures fell within the 60 dBA contour.

The re-design of the interchange at Unionville-Indian Trail Road required the creation of one new commercial receptor (D57) and 6 new residential receptors (D58-D60, E17-E19) that would have been relocated under the previous designs. The re-design of the Austin-Chaney Road intersection required the addition of 4 new receptors (I30-I33) that would have been relocated under previous designs. Maps displaying the location of new receptors are presented in **Appendix B**.

5.0 Revision to Noise Contours

The same analysis methodology used to perform the original analysis is used for this addendum. Noise analysis for this project used a two-step approach to estimate noise levels and to minimize the number of receptors to be included in detailed three-dimensional TNM models in the second step. The first step used TNM to develop noise contours and to identify the sensitive receptors potentially impacted by the DSAs. The basic approach was to select receptor locations at various distances from the proposed alternatives to estimate future noise levels, then to determine the distances at which the predicted peak hour noise levels would be at 60 dBA Leq (representing a substantial increase for receptors with existing noise levels of 45 dBA Leq), or reaching 66 dBA and 71 dBA (representing noise levels approaching 67 dBA Leq and 72 dBA Leq, which are the Noise Abatement Criteria (NAC) for Activity Categories B and C, respectively). Terrain features and shielding were not included in these model runs. The noise contours represent conservative estimates of noise levels valid only for preliminary identification of receptors potentially impacted by future traffic noise.

The noise contours were overlaid onto base mapping, and sensitive receptors within the contours were identified and numbered. There were 251 unique receptors originally identified in the *March 2009 Traffic Noise Technical Memorandum*. As stated in Section 4.0, this addendum includes an additional 11 receptors resulting from changes in roadway design (not new building permits).

New traffic projections and alignment adjustments have resulted in some modifications to noise contours along segments on the west end of the project study area. **Appendix C** includes the noise contour summary spreadsheets for the entire project alignment. Summary sheets in **Appendix C** provide estimates of impacts based on the FHWA and NCDOT NAC. **Table 1** shows the maximum extent of the 71 and 66 dBA Leq 2035 peak hour traffic noise level contours for the Preferred Alternative. Distances to these contour lines are measured from the Monroe Connector/Bypass centerline.

Revised results presented in **Table 1** are similar to the results described in the *March 2009 Traffic Noise Technical Memorandum*. The original report identified 122 NAC Category B receptors and 28 Category C impacts. The revised analysis identified 124 Category B receptors and 29 Category C impacts because of design changes.

As discussed in the *March 2009 Traffic Noise Technical Memorandum*, this information should assist local authorities in exercising land use control over the remaining undeveloped lands adjacent to the roadway within the local jurisdiction. For example, with proper information on noise, the local authorities can prevent further development of incompatible activities and land uses with the predicted noise levels of an adjacent highway.

TABLE 1: 2035 Noise Contours and Impact Summary – Preferred Alternative

Mainline Segment	Leq Noise Levels (dBA) (distance from center of nearest travel lanes)			Maximum Contour Distances (ft)*		Approximate Number of Impacted Receptors By Category				
	50ft	100ft	200ft	71 dBA Leq	66 dBA Leq	A	B	C	D	E
I-485 to Stallings Rd	80	77	72	245	375	0	1	16	0	0
Stallings Rd to Indian Trail-Fairview Rd	79	76	71	240	350	0	13	10	0	0
Indian Trail-Fairview Rd to Unionville-Indian Trail Rd	80	76	71	250	365	0	47	3	0	0
Unionville-Indian Trail Rd to Rocky River Rd	80	76	71	250	365	0	6	0	0	0
Rocky River Rd to US 601	80	77	72	245	350	0	36	0	0	0
US 601 to NC 200 (Morgan Mill Rd)	80	75	70	190	320	0	4	0	0	0
NC 200 (Morgan Mill Rd) to Austin Chaney Rd	76	73	68	180	285	0	3	0	0	0
Austin Chaney Rd to Forest Hills School Rd	75	72	67	160	265	0	14	0	0	0
Forest Hills School Rd to US 74 near Marshville	75	71	66	150	250	0	0	0	0	0
					TOTALS	0	124	29	0	0

* Distances are from the roadway centerline.

6.0 Results of Revised Analysis

Table D1 through **Table D6** in **Appendix D** presents the results of the revised noise impact analysis for the N1, N2, N4, and N5 BEAs. The noise sensitive sites predicted to be impacted (i.e., experience noise levels that approach or exceed FHWA NAC or show a substantial increase over existing levels) that were not considered isolated sites were further evaluated in terms of the feasibility and reasonableness of providing noise barriers. TNM input and output data is also presented in **Appendix E**.

Table 2 below provides a comparison of noise impacts from the *March 2009 Traffic Noise Technical Memorandum* and the results of the revised analysis. Based on the summary table below, the estimated number of noise impacts and the estimated number of receptors experiencing substantial noise increases in BEA N1 would remain unchanged.

Fewer noise impacts and fewer substantial noise increases would occur in BEA N2 due to the changes in projected traffic.

In BEA N4, there would be no change in the number of noise impacted receptors or receptors experiencing substantial noise increases.

In BEA N5, fewer receptors would experience noise impacts and fewer receptors would experience substantial noise increases under the revised interchange at Unionville-Indian Trail Road.

Table 2: Comparison of Impacts in Original and Revised Study

Barrier Evaluation Area	Original Study (March 2009)		Revised Study (this Addendum)	
	Noise Impacts due to FHWA NAC	Noise Impacts due to Substantial Increase	Noise Impacts due to FHWA NAC	Noise Impacts due to Substantial Increase
N1	4	1	4	1
N2	9	33	7	30
N4	29	46	29	46
N5	7	7	1	4

Barrier Analysis

A number of conclusions were reached based on the noise impact analysis performed for BEAs N1, N2, N4 and N5. As in the *March 2009 Traffic Noise Technical Memorandum*, a barrier evaluation was not warranted in BEA N1 due to the fact that the four impacted sites (Receptors A05, A16, A18 and A21) are each in isolated locations.

Because the interchange at Unionville-Indian Trail Road has been reconfigured, anticipated noise impacts in BEA N5 are scattered and therefore do not warrant detailed noise modeling. While E17 and E19 are near each other, a barrier for two receptors is not reasonable. Receptors D38 and D40 are isolated from the other impacted receptors.

Detailed noise analysis for potential noise barriers was performed for the remaining two BEAs (N2 and N4) to preliminarily determine if noise barriers would be feasible and reasonable in these locations. Spreadsheets presenting results are in **Appendix D**. Results of the BEA N2 analysis did not differ from the *March 2009 Traffic Noise Technical Memorandum.* Barriers in this area are not reasonable (cost effective). Results of the BEA N4 analysis are presented below.

Barrier Evaluation Area N4

This area is located along DSA Segment 2 and DSA Segment 21 east of Indian Trail-Fairview Road. Modeled receptors include five clusters of residences, located on either side of the mainline, east and west of Beverly Drive.

The first cluster of residences includes 16 homes south of the project mainline (eastbound side) in the Acorn Woods and Gold Hill subdivisions between Indian Trail-Fairview Road and Beverly Drive (Receptors D01, D03-D09, D11, D12, D41-D46). The second cluster includes three homes on the east side of Beverly Drive (D16-D18), and the third cluster of residences includes eight homes (Receptors D24, D27-D31, D34) and one business (Receptor D23) south of the project mainline (eastbound side) in the Acorn Woods subdivision and along Secrest Shortcut Road between Beverly Drive and just west of Faith Church Road.

A barrier 16 feet high was modeled for the first, second and third clusters of homes and was preliminarily found to be feasible and reasonable. See **Table 3** below for a barrier summary. Barrier N4-1 is shown on **Figure 2**. This barrier differs in length and the number of receptors benefited compared to Barrier N4-1 in the *March 2009 Traffic Noise Technical Memorandum*. In the *March 2009 Traffic Noise Technical Memorandum* the N4-1 barrier was proposed to be 1,522 feet in length, 16 feet high, at a cost of $365,280, and would benefit 16 receptors. The revised N4-1 barrier would be 4,699 feet long, 16 feet high, at a cost of $1,127,760 and would benefit 26 receptors.

The fourth cluster of residences includes fifteen homes (Receptors D02, D10, D13-D15, D19, D20, D22, D25, D26, and D47-D50) and one business (Receptor D21) north of the project mainline (westbound side) in the Acorn Woods subdivision and along Secrest Shortcut Road between Beverly Drive and Faith Church Road.

The fifth cluster of residences includes five homes (Receptors) north of the project mainline (westbound side) in the Acorn Woods subdivision between Indian Trail-Fairview Road and the east side of Beverly Drive. The fifth cluster includes D32, D33, D35, and D51.

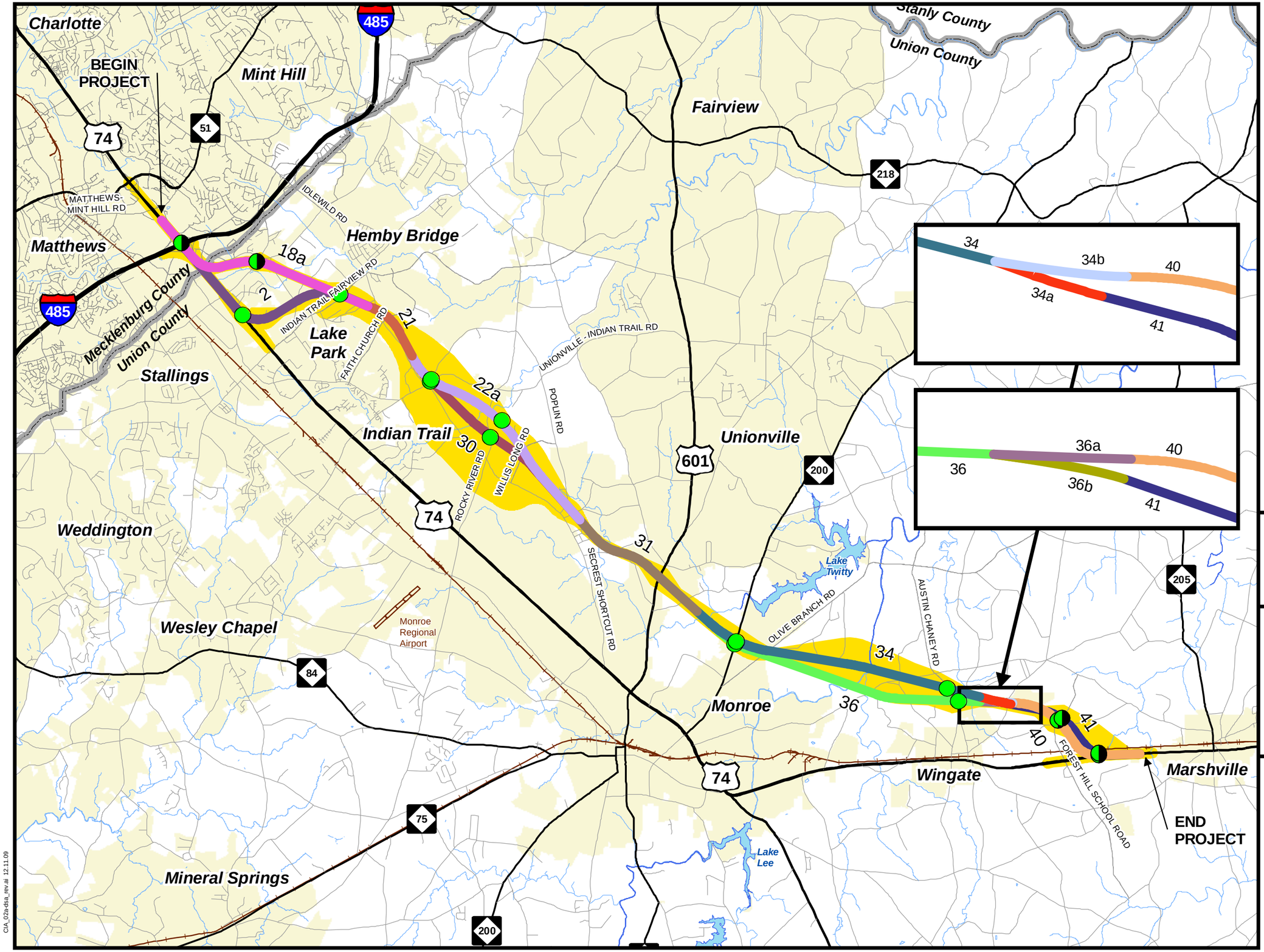
Two barriers designed to work together, ranging in height from 14- to 22-feet high, also were modeled for both the fourth and fifth clusters of receptors and were found to be not reasonable (cost effective).

Other Preliminary Barriers

There are no suggested changes to the other two barriers recommended in the *March 2009 Traffic Noise Technical Memorandum,* N7-2 which would be 2,593 feet long, 16 feet high, at a cost of $622,320, and would benefit 18 receptors; and N9-1b which would be 2,343 feet long, range between 14 and 16 feet high, would cost $543,930, and would benefit 17 receptors.

Table 3: Preliminary Feasible and Reasonable Noise Barriers

Proposed Barriers	Segment	Description	Modeled Receptor #'s	Average dBA Reduction for Benefited Receptors	Benefited Receptors	Number of Impacted Receptors in BEA		Barrier Length (ft)	Barrier Height (ft)	Approximate Cost	Cost Per Receptor / Allowable Cost per Receptor
						Without Barrier	With Barrier				
BEA N4, Barrier N4-1	Segment 2	Eastbound side of mainline. East of Indian Trail-Fairview Rd, west of Faith Church Road, near the Acorn Woods subdivision.	D01, D03-D09, D11, D12, D16-D18, D23-D24, D27-D31, D34, D41-D46	8	26	27	1 (D28)	4,699	16	$ 1,127,760	$43,375/ $44,500

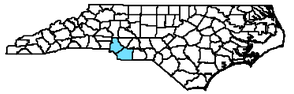


Legend

- Potential Partial Interchange
- Potential Interchange
- Interstate Highway
- US Highway
- NC State Highway
- State Road
- Railroad
- Parcels
- Corridor Study Area
- River / Stream
- Lake
- County Boundary

Detailed Study Alternative

- Segment 18A
- Segment 2
- Segment 21
- Segment 22A
- Segment 30
- Segment 31
- Segment 34
- Segment 34A
- Segment 34B
- Segment 36
- Segment 36A
- Segment 36B
- Segment 40
- Segment 41



Mecklenburg and Union Counties
North Carolina Counties

Source: Mecklenburg County and Union County GIS.
Map Printed On 12-11-09.

N

0 4,250 8,500
Feet

NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. R-3329/R-2559

Mecklenburg County and Union County

MONROE CONNECTOR/ BYPASS

DETAILED STUDY ALTERNATIVES

Figure 1a

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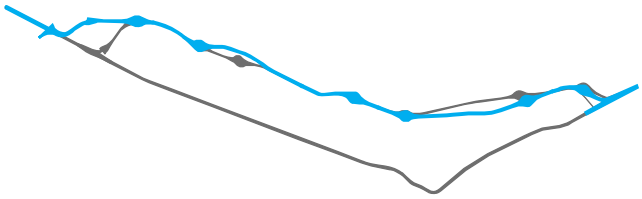
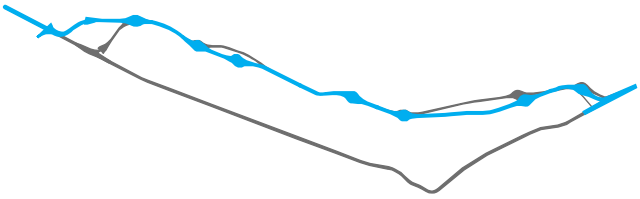
Alternative A

(Segments 18A, 21, 22A, 31, 36, 36A, and 40)



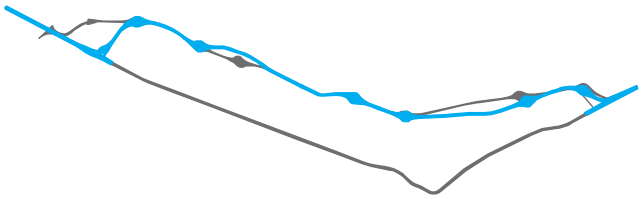
Alternative B

(Segments 18A, 21, 30, 31, 36, 36A, and 40)



Alternative C

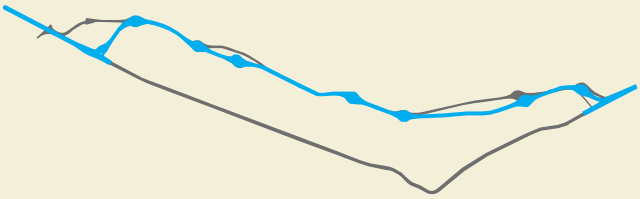
(Segments 2, 21, 22A, 31, 36, 36A, and 40)



Preferred

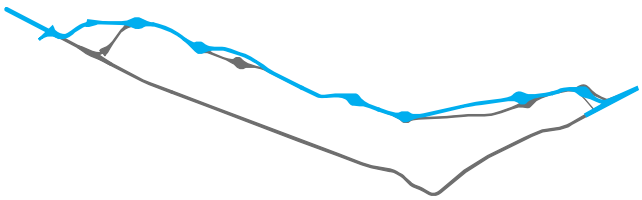
Alternative D

(Segments 2, 21, 30, 31, 36, 36A, and 40)



Alternative A1

(Segments 18A, 21, 22A, 31, 34, 34B, and 40)



Alternative B1

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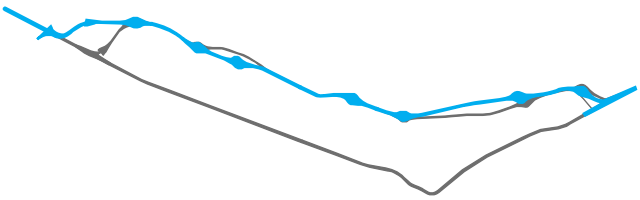

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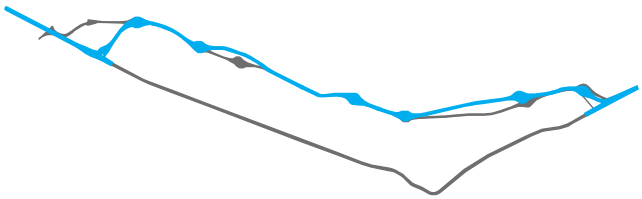

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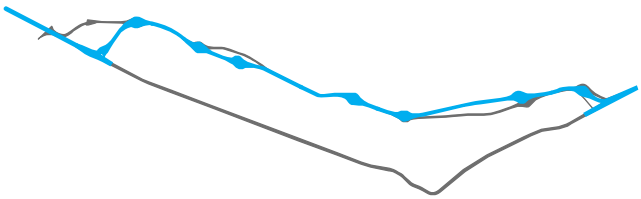

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NORTH CAROLINA Turnpike Authority

MONROE CONNECTOR / BYPASS

STIP PROJECT NO. R-3329 / R-2559

Mecklenburg County and Union County

DETAILED STUDY ALTERNATIVES

Figure 1b

Alternative A2

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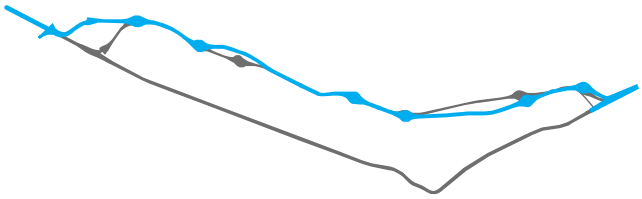

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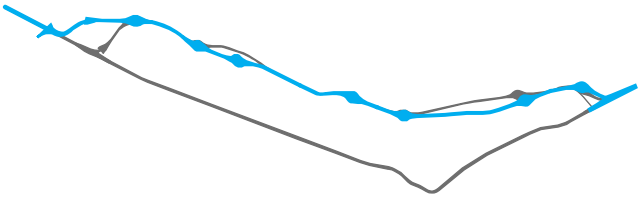
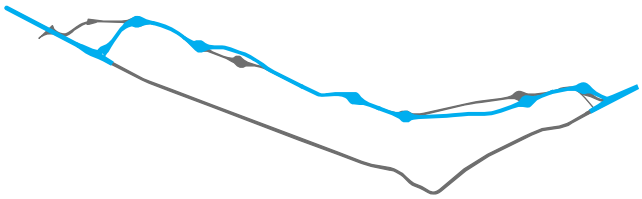


Alternative C2

(Segments 2, 21, 22A, 31, 36, 36B, and 41)



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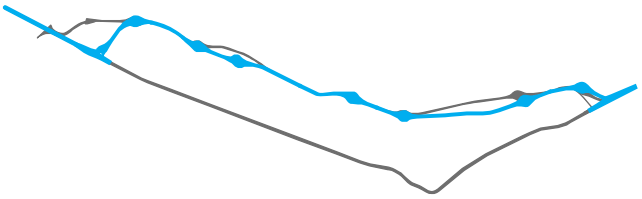

Alternative A3

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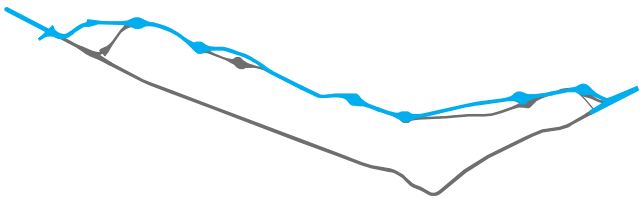

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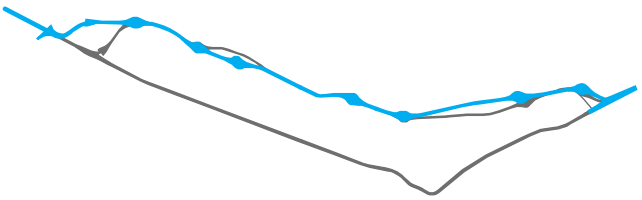

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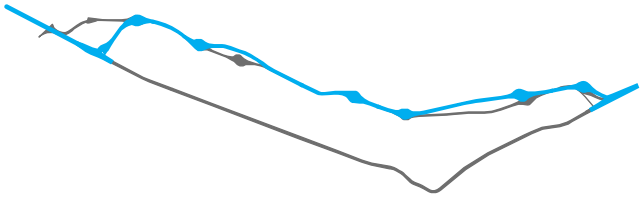

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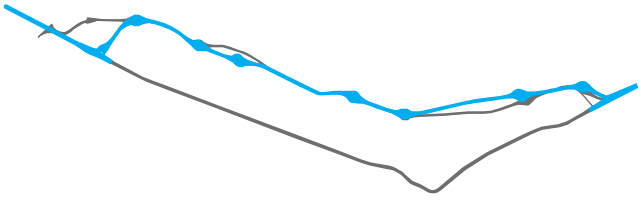


Noise DetailedStudyAlternatives.ai AKH 11.20.09

NORTH CAROLINA Turnpike Authority

MONROE CONNECTOR / BYPASS

STIP PROJECT NO. R-3329 / R-2559

Mecklenburg County and Union County

DETAILED STUDY ALTERNATIVES

Figure 1c

INDIAN TRAIL FAIRVIEW

SECREST SHORTCUT RD

SEGMENT 2

SEGMENT 21

BEVERLY DR

FAITH CHURCH RD

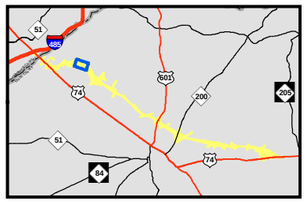
D01 D02 D03 D04 D05 D06 D07 D08 D09 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19 D20 D22 D23 D24 D25 D26 D27 D28 D29 D30 D31 D32 D33 D34 D35 D41 D42 D43 D44 D45 D46 D47 D48 D49 D50 D51

Legend

Noise Receptors

- Benefited Receptor Point
- Receptor Point
- Potential Noise Barrier Protection Area
- Stationing
- Preliminary Road Design
- Segment Breaklines
- Right of Way

NOTE: This barrier (N4-1) has been revised in height and length since the March 2009 Traffic Noise Technical Memorandum.



Source: Mecklenburg County and Union County GIS.
Map Printed On 1.29.2010.

N

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Feet

NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. R-3329/R-2559

Mecklenburg County and Union County

MONROE CONNECTOR/ BYPASS

BARRIER EVALUATION AREA

BARRIER N-4-1

Figure 2

PrefABBarrierEvalAreas_Rev.mxd 01.29.10 AKH Fig2_BarrierN4-1.ai (modified in Illustrator after Arcmap)

APPENDIX A

TRAFFIC PROJECTIONS USED FOR MODELING

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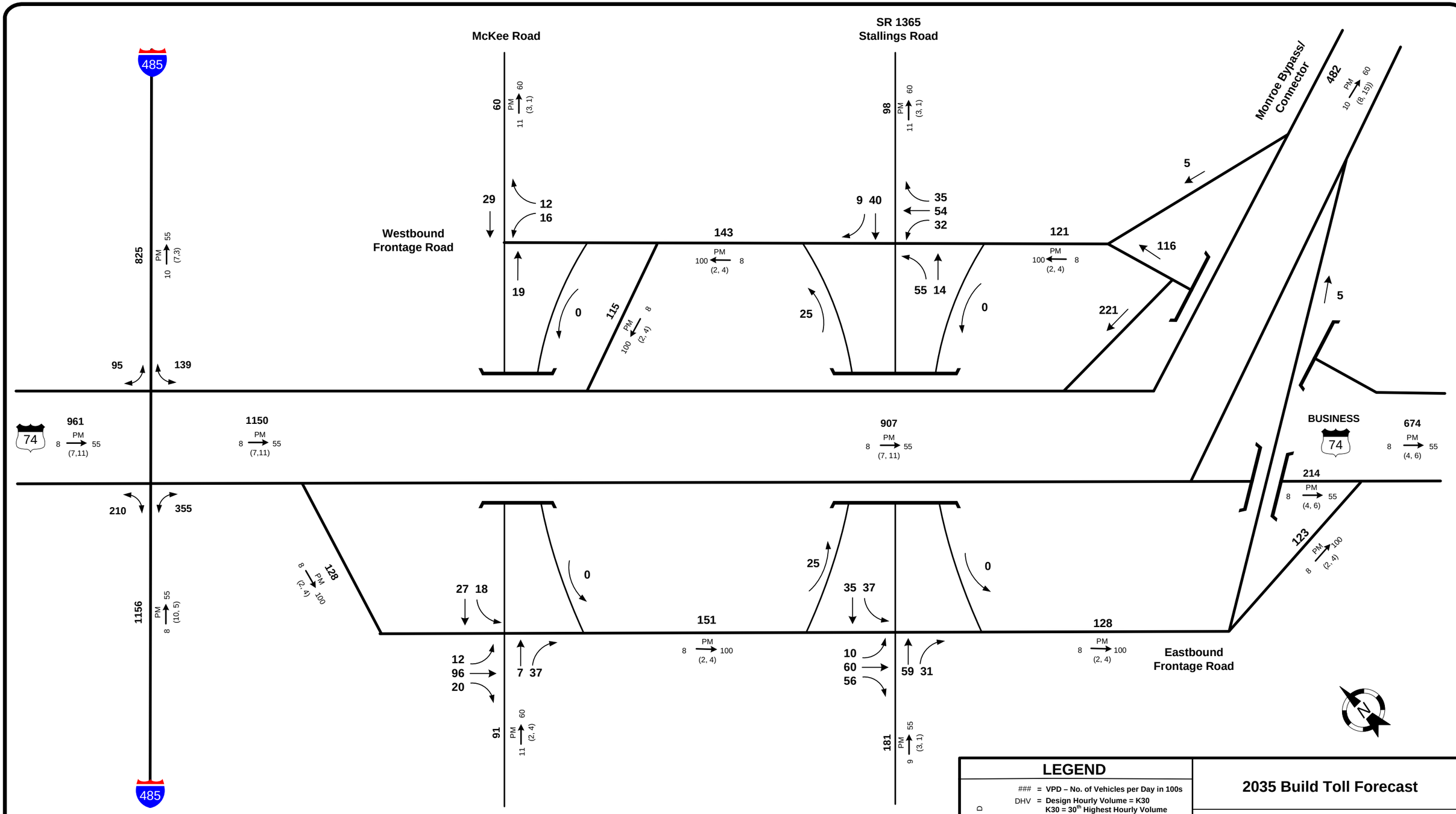


LEGEND

###	=	VPD – No. of Vehicles per Day in 100s
DHV	=	Design Hourly Volume = K30 K30 = 30th Highest Hourly Volume
PM	=	PM Peak Period
D	=	Directional Split (%)
→	=	Indicates Direction of D Reverse Flow for AM Peak
(d,t)	=	Duals, TT-ST's (%)
	=	Daily Turn Movements

PM D / DHV (d,t)

N.T.S.

2035 Build Toll Forecast

Segment 2 (Alternative 3A)

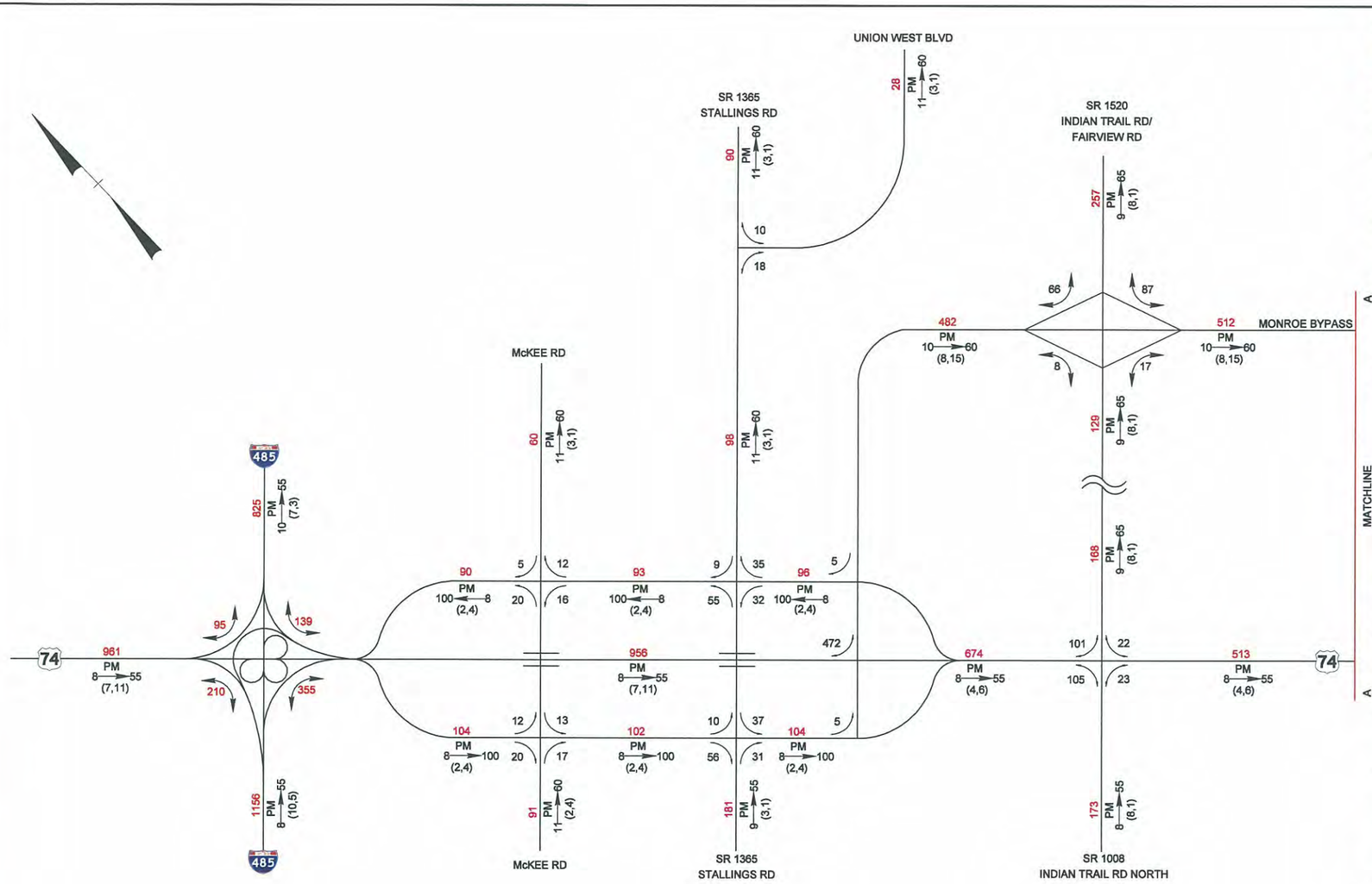
DATE: July 2009

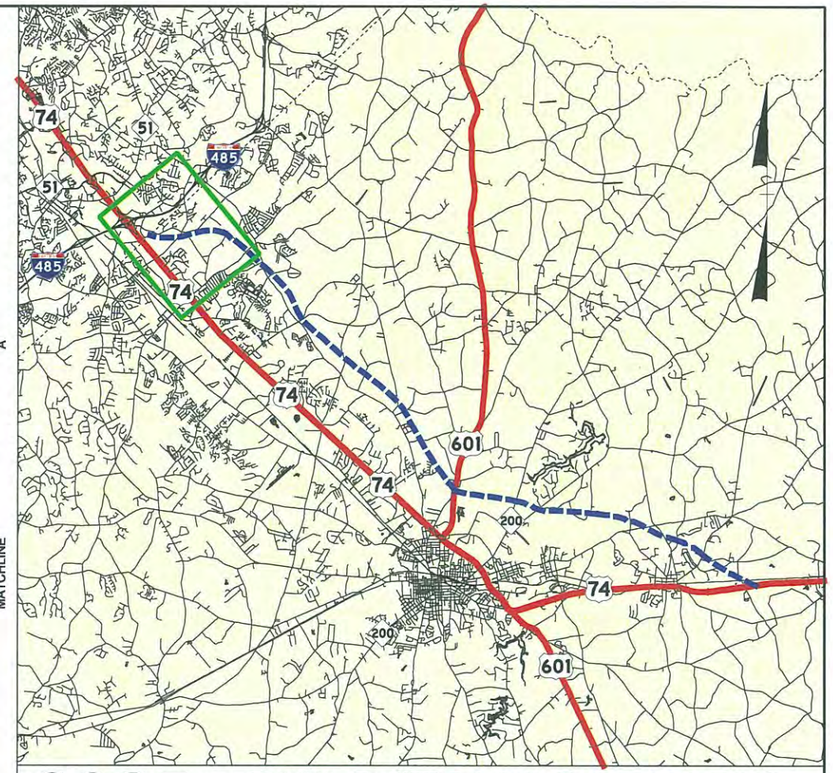
FIGURE 1

NORTH CAROLINA Turnpike Authority

HNTB

HNTB, North Carolina, PC
343 East Six Forks Rd Suite 200
Raleigh, North Carolina 27609





2035 BUILD "TOLL" SCENARIO

AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV AND DIRECTIONAL FACTORS

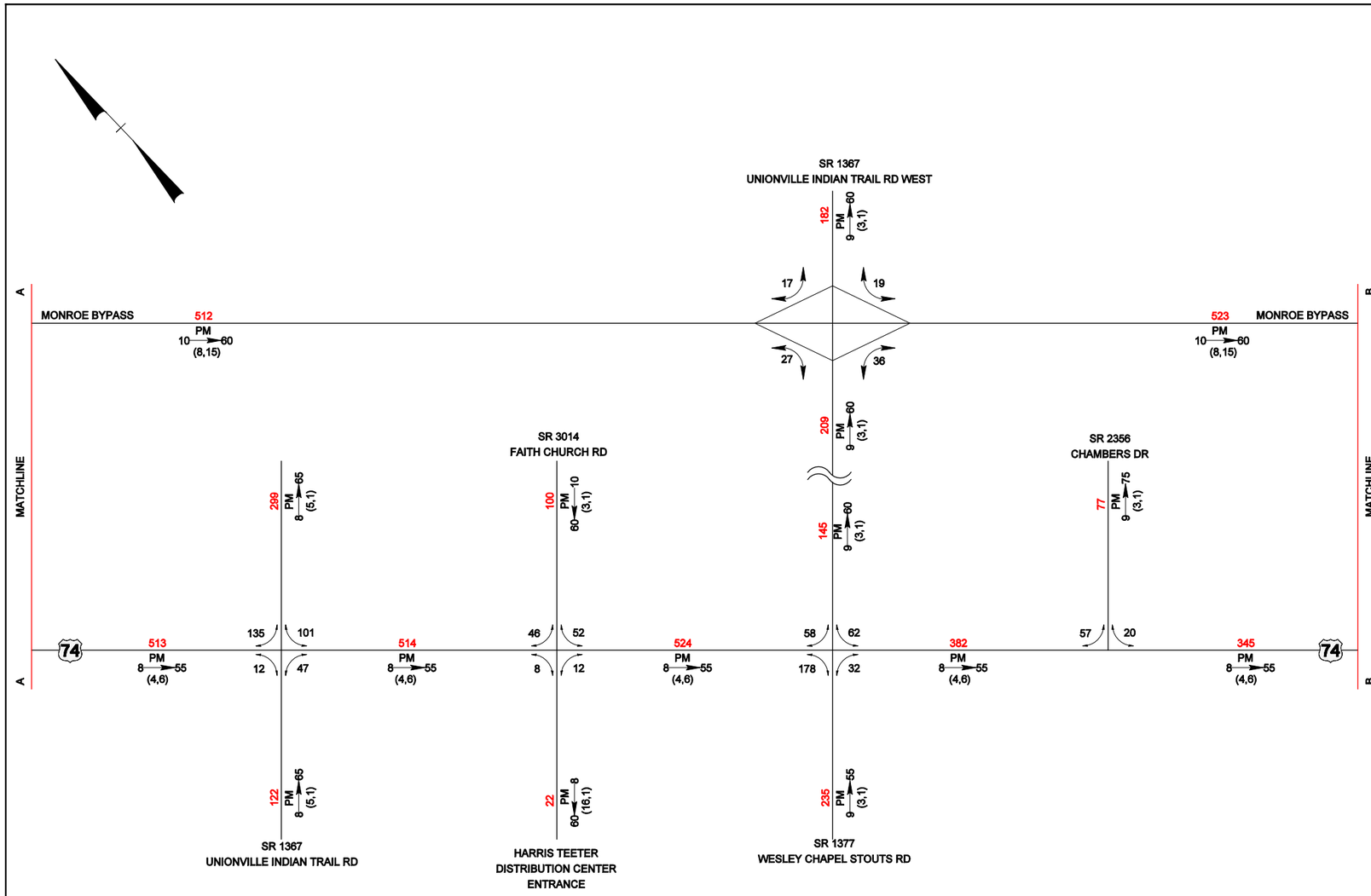
TIP: R-3329/R-2559	REVISED ALTERNATE: 3A	LOCATION:	US 74 in Mecklenburg and Union Counties
PROJECT: Monroe Connector/Bypass		SHEET NUMBER:	1
DIVISION: 10	DATE: June 2008	PREPARED BY:	Wilbur Smith Associates

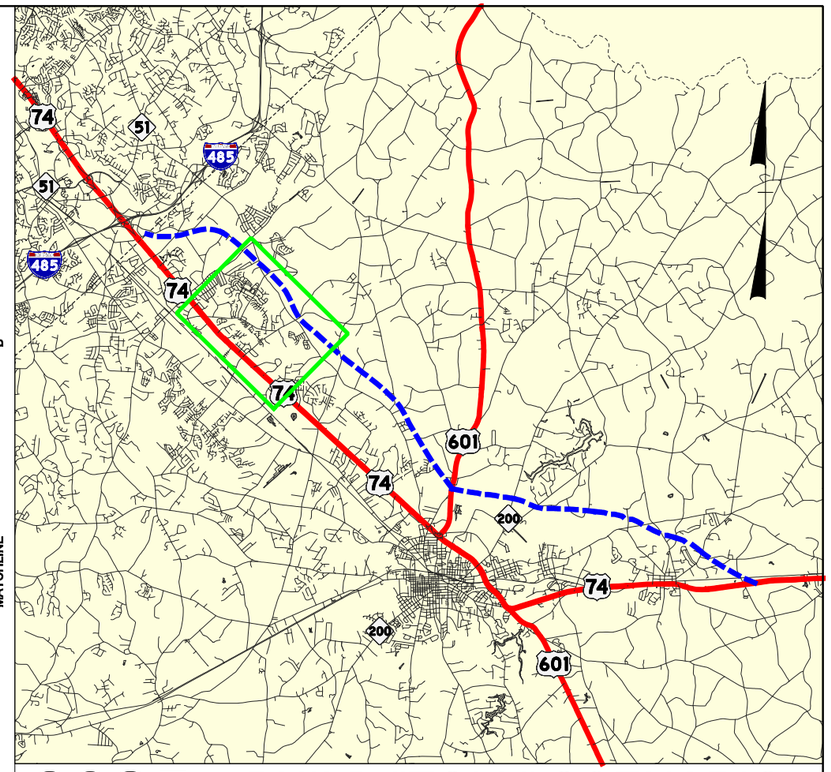
LEGEND

DHV PM → D (d, t)

- DHV Design Hourly Volume (%) = K_{30}
- PM Peak Period
- D Peak Hour Directional Split (%)
- → Indicates Direction of D
- (d, t) Duals, TTST (%)

- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- ### Turning volume (VPD)





2035 BUILD "TOLL" SCENARIO

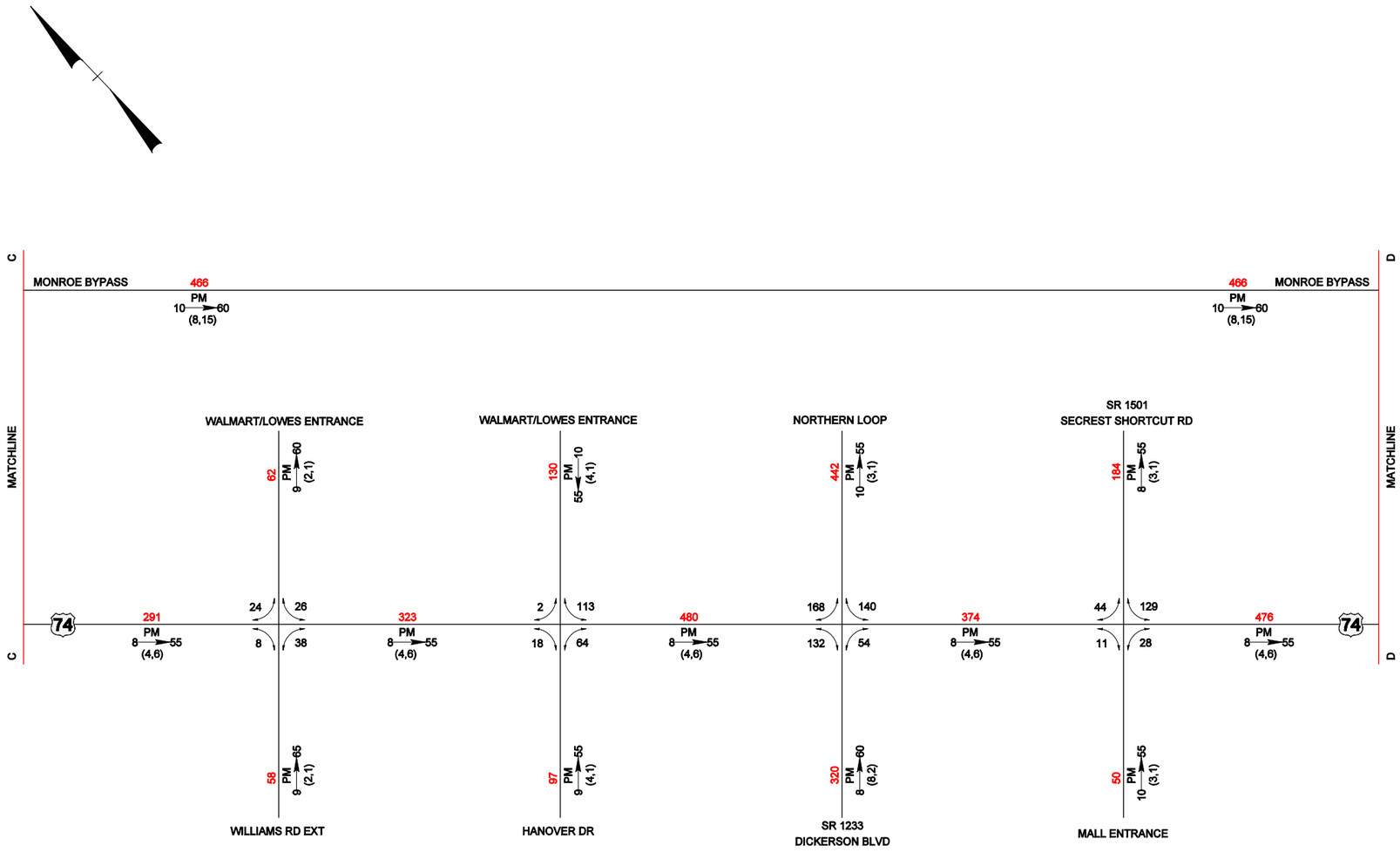
AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV AND DIRECTIONAL FACTORS

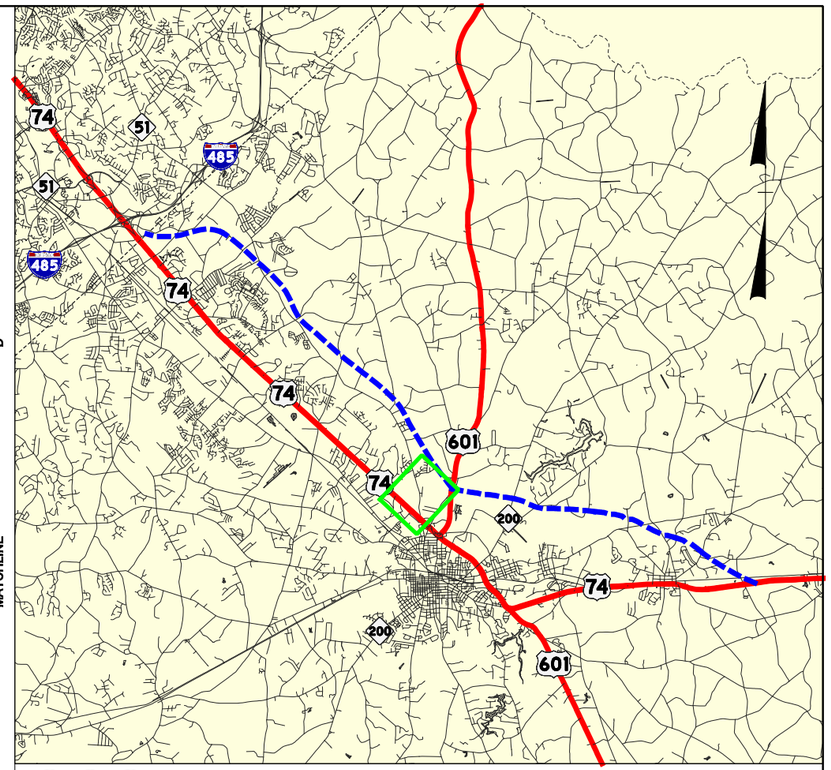
TIP: R-3329/R-2559	ALTERNATE: 3A	LOCATION: US 74 in Mecklenburg and Union Counties
PROJECT: Monroe Connector/Bypass		SHEET NUMBER: 2
DIVISION: 10	DATE: May 2008	PREPARED BY: Wilbur Smith Associates

LEGEND

DHV PM→ D (d, t)

- DHV Design Hourly Volume (%) = K_{30}
- PM Peak Period
- D Peak Hour Directional Split (%)
- → Indicates Direction of D
- (d, t) Duals, TTST (%)
- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- ### Turning volume (VPD)





2035 BUILD "TOLL" SCENARIO

AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV AND DIRECTIONAL FACTORS

TIP: R-3329/R-2559	ALTERNATE: 3A	LOCATION: US 74 in Mecklenburg and Union Counties
PROJECT: Monroe Connector/Bypass		SHEET NUMBER: 4
DIVISION: 10	DATE: May 2008	PREPARED BY: Wilbur Smith Associates

LEGEND

DHV $\xrightarrow{\text{PM}}$ D
(d, t)

- DHV Design Hourly Volume (%) = K_{30}
- PM Peak Period
- D Peak Hour Directional Split (%)
- → Indicates Direction of D
- (d, t) Duals, TTST (%)
- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- ### Turning volume (VPD)

N1

Alternative 3A

I485 to Stallings Road (SR 1365)

Mainline Segment	Direction	Total ADT	Directional Split %	Directional Split #	% Hourly	Peak HR	% Cars	# Cars	% MT	# MT	% HT	HT
US 74 W. of McKee	WB	115000	55%	63250	8%	5060	91.0%	4605	3.5%	177	5.5%	278
US 74 W. of McKee	EB	115000	45%	51750	8%	4140	91.0%	3767	3.5%	145	5.5%	228
US 74 E. of McKee	WB	90700	45%	40815	8%	3265	91.0%	2971	3.5%	114	5.5%	180
US 74 E. of McKee	EB	90700	55%	49885	8%	3991	91.0%	3632	3.5%	140	5.5%	219
North Service Rd to On-ramp	WB	14300	100%	14300	8%	1144	97.0%	1110	1.0%	11	2.0%	23
South Service Rd	EB	15100	100%	15100	8%	1208	97.0%	1172	1.0%	12	2.0%	24
McKee Rd NB N. of US 74	NB	6000	60%	3600	11%	396	98.0%	388	1.5%	6	0.5%	2
McKee Rd SB N. of US 74	SB	6000	40%	2400	11%	264	98.0%	259	1.5%	4	0.5%	1
McKee Rd NB S. of US 74	NB	9100	60%	5460	11%	601	97.0%	583	1.0%	6	2.0%	12
McKee Rd. SB S. of US 74	SB	9100	40%	3640	11%	400	97.0%	388	1.0%	4	2.0%	8
Stallings Rd. N. of US 74	NB	9800	60%	5880	11%	647	98.0%	634	1.5%	10	0.5%	3
Stallings Rd. N. of US 74	SB	9800	40%	3920	11%	431	98.0%	423	1.5%	6	0.5%	2
Stallings Rd. S. of US 74	NB	18100	55%	9955	9%	896	98.0%	878	1.5%	13	0.5%	4
Stallings Rd. S. of US 74	SB	18100	45%	8145	9%	733	98.0%	718	1.5%	11	0.5%	4
South Service Rd E. of Stallings Rd				12800	8%	1024	97.0%	993	1.0%	10	2.0%	20
WB Ramp to North Service Rd				12100	8%	968	97.0%	939	1.0%	10	2.0%	19
WB On-Ramp from North Service Rd				11500	8%	920	97.0%	892	1.0%	9	2.0%	18
North Service Rd W. of on Ramp				2800	8%	224	97.0%	217	1.0%	2	2.0%	4
EB Off-Ramp to South Service Rd				12800	8%	1024	97.0%	993	1.0%	10	2.0%	20

N2

Alternative 3A

SR 1365 (Stallings Rd) to SR 1520 (Indian Trail/Fairview Rd)

Roadway Segment	Direction	Total ADT	Directional Split %	Directional Split #	% Hourly	Peak HR	% Cars	# Cars	% MT	# MT	% HT	HT
US 74 EB, W. of Monroe Bypass Ramp to Stallings Rd	EB	90700	55%	49885	8%	3991	91.0%	3632	3.5%	140	5.5%	219
Monroe Bypass WB, W. of US 74 Merge	WB	90700	45%	40815	8%	3265	91.0%	2971	3.5%	114	5.5%	180
EB Exit Ramp to US 74	EB			12800	8%	1024	97.0%	993	1.0%	10	2.0%	20
SB Stallings Rd. N. of US 74	SB	9800	40%	3920	11%	431	98.0%	423	1.5%	6	0.5%	2
NBStallings Rd. N. of US 74	NB	9800	60%	5880	11%	647	98.0%	634	1.5%	10	0.5%	3
SB Stallings Rd. S. of Bypass	SB	18100	45%	8145	9%	733	98.0%	718	1.5%	11	0.5%	4
NB Stallings Rd. S. of Bypass	NB	18100	55%	9955	9%	896	98.0%	878	1.5%	13	0.5%	4
EB Monroe Bypass E. of Ramp to N. Service Rd	EB	48200	60%	28920	10%	2,892	88.5%	2,559	4.0%	116	7.5%	217
WB Monroe Bypass E. of Ramp to N. Service Rd	WB	48200	40%	19280	10%	1,928	88.5%	1,706	4.0%	77	7.5%	145
WB Business 74 E. of Bypass Ramps	WB	67400	45%	30330	8%	2,426	95.0%	2,305	2.0%	49	3.0%	73
WB Business 74 E. of Bypass Ramps	EB	67400	55%	37070	8%	2,966	95.0%	2,817	2.0%	59	3.0%	89
EB S. Service Rd Ramp to Business 74 EB	EB	12300	100%	12300	8%	984	97.0%	954	1.0%	10	2.0%	20
WB Ramp, Bus 74 to N. Service Rd	WB	11600	100%	11600	8%	928	97.0%	900	1.0%	9	2.0%	19
EB Bus 74 Ramp from Bypass Split	EB	21400	55%	11770	8%	942	95.0%	895	2.0%	19	3.0%	28
EB Ramp from S. Service Road to Bypass EB	EB	500	100%	500	8%	40	97.0%	39	1.0%	0	2.0%	1
WB Monroe Bypass to Business 74	WB	47200	40%	18880	8%	1,510	88.5%	1,337	4.0%	60	7.5%	113
EB Monroe Bypass to Business 74	EB	47200	60%	28320	8%	2,266	88.5%	2,005	4.0%	91	7.5%	170
North Service Rd E. of Stallings Rd				12100	8%	968	97.0%	939	1.0%	10	2.0%	19
WB Ramp from Monroe Bypass to N. Service Road	WB	500	100%	500	8%	40	97.0%	39	1.0%	0	2.0%	1
WB Ramp from Bus 74 to Bypass	WB	22100	100%	22100	8%	1,768	95.0%	1,680	2.0%	35	3.0%	53

N4
Alternative 3A
SR 1520 (Indian Trail/Fairview Rd) to SR 1367 (Unionville Indian Trail Rd West)

Mainline Segment	Direction	Total ADT	Directional Split %	Directional Split #	% Hourly	Peak HR	% Cars	# Cars	% MT	# MT	% HT	HT
Monroe Bypass	WB	51,200	40%	20,480	10%	2,048	88.5%	1,812	4.0%	82	7.5%	154
Monroe Bypass	EB	51,200	60%	30,720	10%	3,072	88.5%	2,719	4.0%	123	7.5%	230
SR 1520 N. of Bypass												
Indian Trail/Fairview Rd (SR 1520)	NB	25,700	65%	16,705	9%	1,503	95.5%	1,436	4.0%	60	0.5%	8
Indian Trail/Fairview Rd (SR 1520)	SB	25,700	35%	8,995	9%	810	95.5%	773	4.0%	32	0.5%	4
SR 1520 S. of Bypass												
Indian Trail/Fairview Rd (SR 1520)	NB	12,900	65%	8,385	9%	755	95.5%	721	4.0%	30	0.5%	4
Indian Trail/Fairview Rd (SR 1520)	SB	12,900	35%	4,515	9%	406	95.5%	388	4.0%	16	0.5%	2
Secrest Shortcut Rd	NB	18,400	55%	10,120	8.0%	810	98.0%	793	1.5%	12	0.5%	4
Secrest Shortcut Rd	SB	18,400	45%	8,280	8.0%	662	98.0%	649	1.5%	10	0.5%	3
Faith Church Rd (SR 3014)	NB	10,000	40%	4,000	10%	400	98.0%	392	1.5%	6	0.5%	2
Faith Church Rd (SR 3014)	SB	10,000	60%	6,000	10%	600	98.0%	588	1.5%	9	0.5%	3

N5

Alternative 3A

SR 1520 (Indian Trail/Fairview Rd) to East of SR1367 (Unionville Indian Trail Rd West)

Mainline Segment	Direction	Total ADT	Directional Split %	Directional Split #	% Hourly	Peak HR	% Cars	# Cars	% MT	# MT	% HT	HT
Monroe Bypass												
Monroe Bypass, E. of WB Off-Ramp	WB	52300	40%	20920	10.0%	2092	88.5%	1851	4.0%	84	7.5%	157
Monroe Bypass, E. of EB On-Ramp	EB	52300	60%	31380	10.0%	3138	88.5%	2777	4.0%	126	7.5%	235
Monroe Bypass Off-Ramp to On-Ramp	WB	51800	40%	20720	10.0%	2072	88.5%	1834	4.0%	83	7.5%	155
Monroe Bypass Off-Ramp to Off-Ramp	EB	51800	60%	31080	10.0%	3108	88.5%	2751	4.0%	124	7.5%	233
Monroe Bypass, W. of WB Off-Ramp	WB	51200	40%	20480	10.0%	2048	88.5%	1812	4.0%	82	7.5%	154
Monroe Bypass, W. of EB On-Ramp	EB	51200	60%	30720	10.0%	3072	88.5%	2719	4.0%	123	7.5%	230
Unionville Indian Trail Road North of Monroe Bypass	NB	18200	60%	10920	9.0%	983	98.0%	963	1.5%	15	0.5%	5
Unionville Indian Trail Road North of Monroe Bypass	SB	18200	40%	7280	9.0%	655	98.0%	642	1.5%	10	0.5%	3
Unionville Indian Trail Road South of Monroe Bypass	NB	20900	60%	12540	9.0%	1129	98.0%	1106	1.5%	17	0.5%	6
Unionville Indian Trail Road South of Monroe Bypass	SB	20900	40%	8360	9.0%	752	98.0%	737	1.5%	11	0.5%	4
WB On-Ramp to Monroe Bypass		1700	100%	1700	9.0%	153	98.0%	150	1.5%	2	0.5%	1
EB Off-Ramp from Monroe Bypass		2700	100%	2700	9.0%	243	98.0%	238	1.5%	4	0.5%	1
WB Off-Ramp from Monroe Bypass		1900	100%	1900	9.0%	171	98.0%	168	1.5%	3	0.5%	1
EB On-Ramp to Monroe Bypass		3600	100%	3600	9.0%	324	98.0%	318	1.5%	5	0.5%	2
Seacrest Shortcut Rd												
Secrest Shortcut Rd	WB	18400	55%	10120	8.0%	810	98.0%	793	1.5%	12	0.5%	4
Secrest Shortcut Rd	EB	18400	45%	8280	8.0%	662	98.0%	649	1.5%	10	0.5%	3

APPENDIX B

CONTOUR MAPPING OF NEW RECEPTOR LOCATIONS

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NOTE: New receptor points included in this revised analysis are: D57, D58, D59, D60, E17, E18, and E19.

Bonterra Village

Arbor Glen

Braefield

Suburban Estates

SEGMENT 21

SEGMENT 30

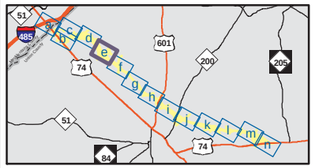
ALLEY
LADY'S SECRET DR
PHAR LAP DR
HERCULES DR
BIMELECH DR
AFFIRMED DR
BELMONT STAKES AV
SARATOGA BLVD
KIKER BROCK DR
POPLIN RD
SOUTHWIND TRAIL DR
HUNTERS TRAIL DR
THISTLEWOOD CIR
SCOTT LONG RD
OAKBRIAR CIR
GLEN HOLLOW DR
NUTHATCH DR
EDGEVIEW DR
SUN ROSE CT
BRAEFIELD DR
UNIONVILLE INDIAN TRAIL RD
SECREST SHORT CUT RD
DAYBREAK DR
BLACKVINE DR
SPRING HARVEST DR
NATURE WAY PL

D53 D54 D55 D56 D40 D37 D39 D38 D57 D58 D59 D60 E17 E18 E19 E07 E08 E09 E05 E10

Legend

Noise Receptors
- Church/School
- Commercial
- Residential

- 60dBA Leq.
- 66dBA Leq.
- 71dBA Leq.
- Roadway Bridge
- Functional Road Design
- Segment Breaks
- Right of Way
- Study Corridor
- Parcels
- Cemetery
- Church
- Library
- Schools
- Parks
- Subdivisions
- Streets
- County Boundaries
- Hydrology



Source: Mecklenburg and Union Counties GIS Map Printed 11.13.09

N

0 600
Feet

NORTH CAROLINA Turnpike Authority

STIP PROJECT
NO. R-3329 & R-2559

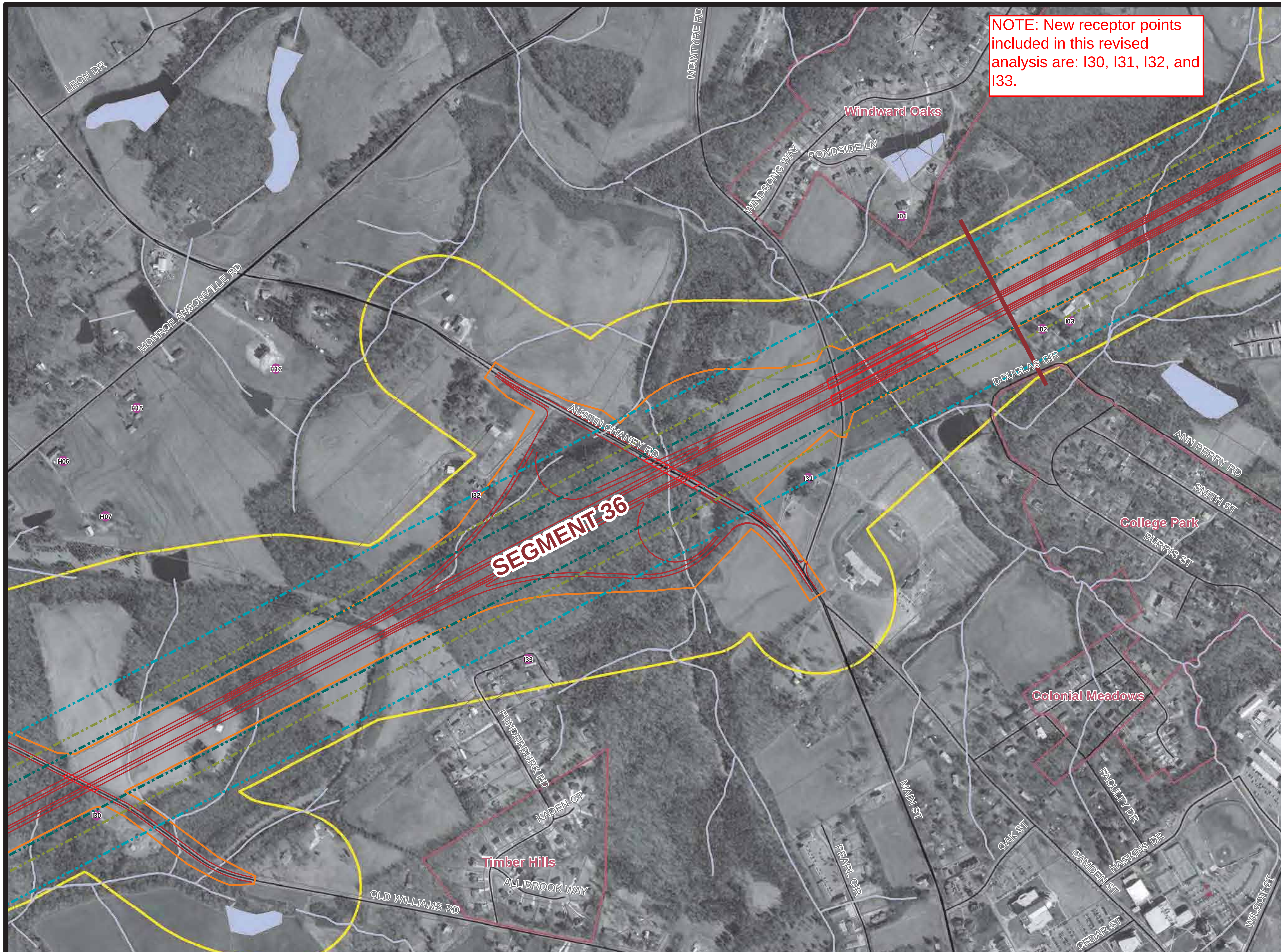
Mecklenburg County
and Union County

MONROE CONNECTOR/BYPASS

2035 NOISE CONTOURS and SENSITIVE RECEPTOR LOCATIONS

Figure B1

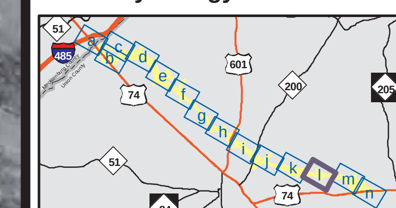
NoiseStudyMapbookPrefAlt.mxd AKH 11.13.09



Legend

Noise Receptors

- Church/School
- Commercial
- Residential
- 60dBA Leq.
- 66dBA Leq.
- 71dBA Leq.
- Roadway Bridge
- Functional Road Design
- Segment Breaks
- Right of Way
- Study Corridor
- Parcels
- Cemetery
- Church
- Library
- Schools
- Parks
- Subdivisions
- Streets
- County Boundaries
- Hydrology



Source: Mecklenburg and Union Counties GIS Map Printed 11.13.09

N

0 600

Feet

NORTH CAROLINA Turnpike Authority

STIP PROJECT NO. R-3329 & R-2559

Mecklenburg County and Union County

MONROE CONNECTOR/BYPASS

2035 NOISE CONTOURS and SENSITIVE RECEPTOR LOCATIONS

Figure B2

NoiseStudyMapbookPrefAlt.mxd AKH 11.13.

APPENDIX C

NOISE CONTOUR SUMMARY SPREADSHEETS

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INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0

INPUTS FOR FUTURE NOISE LEVELS

D-M	-L- West of I-485	N/A PRD # 2	N/A PRD # 3	NOISE CONTOURS
72	83.7	0.0	0.0	72
97	80.6	0.0	0.0	67
147	77.3	0.0	0.0	66
247	72.3	0.0	0.0	50
447	64.7	0.0	0.0	DESIRED
847	59.2	0.0	0.0	55
1647	51.1	0.0	0.0	dBA ^
R0	41.0	0.0	0.0	

DISTANCE TO CL
246.5
364.8
395.6
0.0
1185.6

Minimum Right-of-way Distance From CL
150

---------- R/W ----------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY Segment	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE
A01	Commercial	C	Independence Blvd	65	L18	-L-	152	-	-	* 76	** + 11
A02	Commercial	C	Independence Blvd	65	L18	-L-	172	-	-	* 75	** + 10
A03	Commercial	C	Independence Blvd	65	L18	-L-	166	-	-	* 75	** + 10
A04	Residential	B	Independence Blvd	65	L18	-L-	600	-	-	62	- 3
A23	Residential	B	Independence Blvd	65	L18	-L-	439	-	-	64	- 1

1. D-M = Distance from roadway centerline. R0 = Distance from centerline to middle of outside lane.
2. The -L- column lists the noise level results from the TNM contour models.
3. Ambient noise level estimated based on measurements of existing noise levels at locations with similar land use/traffic conditions.
   The minimum ambient noise level is 45 dBA Leq.
4. "*" denotes a noise impact per 23 CFR 772.
5. "**" deontes a substantial noise level increase per NCDOT Traffic Noise Abatement Policy.

-L- Denotes proposed roadways's noise level contribution and -Y- denotes contributions from other roadways.
"*" Denotes a noise impact per 23 CFR Part 772 and/or the NCDOT Traffic Noise Abatement Policy.

INPUTS FOR AMBIENT NOISE LEVELS			
		N/A	BACKGROUND
D-M	AMB # 1	AMB # 2	NOISE LEVEL
25	0.0	0.0	FOR AREA
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0

INPUTS FOR FUTURE NOISE LEVELS				NOISE
	-L-	N/A	N/A	CONTOURS
D-M	I-485 - Stallings	PRD # 2	PRD # 3	
72	83.5	0.0	0.0	72
97	80.4	0.0	0.0	66
147	77.1	0.0	0.0	50
247	72.1	0.0	0.0	DESIRED
447	64.5	0.0	0.0	55
847	59.0	0.0	0.0	dBA ^
1647	51.0	0.0	0.0	
R0	41.0	0.0	0.0	

DISTANCE TO CL
242.8
358.9
389.2
0.0
1171.0

Minimum Right-of-way Distance From CL
150

---------- R/W ----------

RECEPTOR INFORMATION			NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY			PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
ID#	LAND USE	CATEGORY			Segment	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	
A05	Commercial	C	Independence Blvd	65	L2	-L-	169	-	-	* 75	** + 10
A06	Commercial	C	Independence Blvd	65	L2	-L-	184	-	-	* 74	+ 9
A07	Commercial	C	Independence Blvd	65	L2	-L-	187	-	-	* 74	+ 9
A08	Commercial	C	Independence Blvd	65	L2	-L-	162	-	-	* 75	** + 10
A09	Commercial	C	Independence Blvd	65	L2	-L-	155	-	-	* 76	** + 11
A10	Commercial	C	Independence Blvd	65	L2	-L-	162	-	-	* 75	** + 10
A11	Commercial	C	Independence Blvd	65	L2	-L-	160	-	-	* 75	** + 10
A12	Commercial	C	Independence Blvd	65	L2	-L-	159	-	-	* 75	** + 10
A13	Commercial	C	Independence Blvd	65	L2	-L-	178	-	-	* 74	+ 9
A14	Commercial	C	Independence Blvd	65	L2	-L-	166	-	-	* 75	** + 10
A15	Commercial	C	Independence Blvd	65	L2	-L-	162	-	-	* 75	** + 10
A16	Commercial	C	Independence Blvd	65	L2	-L-	156	-	-	* 76	** + 11
A17	Commercial	C	Independence Blvd	65	L2	-L-	163	-	-	* 75	** + 10
A18	Commercial	C	Independence Blvd	65	L2	-L-	163	-	-	* 75	** + 10
A19	Commercial	C	Independence Blvd	65	L2	-L-	182	-	-	* 74	+ 9
A20	Commercial	C	Independence Blvd	65	L2	-L-	179	-	-	* 74	+ 9
A21	Residential	B	Independence Blvd	65	L2	-L-	291	-	-	* 69	+ 4
A22	Commercial	C	McKee Rd	54	L2	-L-	564	-	-	62	+ 8

1. D-M = Distance from roadway centerline. R0 = Distance from centerline to middle of outside lane.
2. The -L- column lists the noise level results from the TNM contour models.
3. Ambient noise level estimated based on measurements of existing noise levels at locations with similar land use/traffic conditions.
   The minimum ambient noise level is 45 dBA Leq.
4. "*" denotes a noise impact per 23 CFR 772 .
5. "**" deontes a substantial noise level increase per NCDOT Traffic Noise Abatement Policy.

INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0

INPUTS FOR FUTURE NOISE LEVELS[1,2]

D-M	-L- Stallings to Ind Trail	N/A PRD # 2	N/A PRD # 3
72	83.5	0.0	0.0
97	79.2	0.0	0.0
147	76.0	0.0	0.0
247	71.0	0.0	0.0
447	63.4	0.0	0.0
847	57.6	0.0	0.0
1647	49.7	0.0	0.0
R0	41.0	0.0	0.0

NOISE CONTOURS	DISTANCE TO CL
72	214.8
67	328.7
66	356.1
50	1595.9
DESIRED	
55	1045.2
dBA ^	

Minimum Right-of-way Distance From CL: 150

---------- R/W ----------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL[3]	NEAREST PROPOSED ROADWAY Segment	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM[4]	NOISE LEVEL INCREASE[4]
C09	Residential	B	Forest Park Rd	54	L2	-L-	466	-	-	62	+ 8
C10	Residential	B	Forest Park Rd	54	L2	-L-	460	-	-	63	+ 9
C11	Commercial	C	Union West Blvd	53	L2	-L-	486	-	-	62	+ 9
C12	Residential	B	Sherin Ln	51	L2	-L-	347	-	-	* 66	** + 15
C13	Commercial	C	Union West Blvd	51	L2	-L-	238	-	-	* 71	** + 20
C14	Commercial	C	Independence Blvd	56	L2	-L-	244	-	-	70	** + 14
C15	Commercial	C	Union West Blvd	49	L2	-L-	352	-	-	66	** + 17
C16	Residential	B	Sherrin Ln	45	L2	-L-	445	-	-	63	** + 18
C17	Commercial	C	Van Buren Ave	45	L2	-L-	384	-	-	65	** + 20
C18	Commercial	C	Van Buren Ave	45	L2	-L-	289	-	-	68	** + 23
C19	Commercial	C	Van Buren Ave	45	L2	-L-	272	-	-	69	** + 24
C20	Commercial	C	Van Buren Ave	45	L2	-L-	223	-	-	* 71	** + 26
C21	Residential	B	Oscar Robinson	45	L2	-L-	307	-	-	* 67	** + 22
C22	Commercial	C	Van Buren Ave	45	L2	-L-	191	-	-	* 73	** + 28
C23	Residential	B	Strand Dr	45	L2	-L-	327	-	-	* 67	** + 22
C24	Residential	B	Strand Dr	45	L2	-L-	193	-	-	* 72	** + 27
C25	Residential	B	Oak Spring Rd	45	L2	-L-	189	-	-	* 73	** + 28
C26	Residential	B	Oak Spring Rd	45	L2	-L-	431	-	-	63	** + 18
C29	Residential	B	Pine Tree Dr	54	L2	-L-	474	-	-	62	+ 8
C30	Residential	B	Pine Tree Dr	54	L2	-L-	460	-	-	63	+ 9
C31	Residential	B	Pine Tree Dr	54	L2	-L-	478	-	-	62	+ 8
C32	Residential	B	Pine Tree Dr	54	L2	-L-	480	-	-	62	+ 8
C33	Residential	B	Pine Tree Dr	54	L2	-L-	482	-	-	62	+ 8
C34	Residential	B	Pine Tree Dr	54	L2	-L-	492	-	-	62	+ 8
C35	Residential	B	Pine Tree Dr	54	L2	-L-	584	-	-	60	+ 6
C36	Residential	B	Pine Tree Dr	54	L2	-L-	682	-	-	59	+ 5
C37	Commercial	C	Independence Blvd	57	L2	-L-	389	-	-	64	+ 7
C38	Commercial	C	Independence Blvd	56	L2	-L-	394	-	-	64	+ 8
C39	Commercial	C	Independence Blvd	53	L2	-L-	393	-	-	64	+ 11
C40	Commercial	C	Union West Blvd	45	L2	-L-	470	-	-	62	** + 17
C41	Residential	B	Sherrin Ln	45	L2	-L-	571	-	-	61	** + 16
C42	Residential	B	Sherrin Ln	45	L2	-L-	489	-	-	62	** + 17
C43	Residential	B	White Oak Ln	45	L2	-L-	588	-	-	60	** + 15
C44	Residential	B	White Oak Ln	45	L2	-L-	535	-	-	61	** + 16
C45	Residential	B	White Oak Ln	45	L2	-L-	438	-	-	63	** + 18
C46	Residential	B	White Oak Ln	45	L2	-L-	512	-	-	62	** + 17
C47	Commercial	C	Van Buren Ave	45	L2	-L-	496	-	-	62	** + 17

1. D-M = Distance from roadway centerline. R0 = Distance from centerline to middle of outside lane.
2. The -L- column lists the noise level results from the TNM contour models.
3. Ambient noise level estimated based on measurements of existing noise levels at locations with similar land use/traffic conditions. The minimum ambient noise level is 45 dBA Leq.
4. "*" denotes a noise impact per 23 CFR 772 .
5. "**" denotes a substantial noise level increase per NCDOT Traffic Noise Abatement Policy.

INPUTS FOR AMBIENT NOISE LEVELS			
		N/A	BACKGROUND
D-M	AMB # 1	AMB # 2	NOISE LEVEL
25	0.0	0.0	FOR AREA
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0

INPUTS FOR FUTURE NOISE LEVELS[1,2]				NOISE CONTOURS		DISTANCE TO CL	Minimum Right-of-way Distance From CL
	-L-	N/A	N/A				
D-M	Ind Trl - Unionvlle	PRD # 2	PRD # 3	72		219.6	
72	82.4	0.0	0.0	67		335.5	
97	79.5	0.0	0.0	66		363.9	150
147	76.2	0.0	0.0	50		1623.5	
247	71.2	0.0	0.0	DESIRED			
447	63.7	0.0	0.0	55		1068.6	
847	57.9	0.0	0.0	dBA ^			
1647	49.9	0.0	0.0				
R0	41.0	0.0	0.0				

---------- R/W ----------

RECEPTOR INFORMATION			NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL[3]	NEAREST PROPOSED ROADWAY			PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE[4]
ID#	LAND USE	CATEGORY			Segment	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM[4]	
D01	Residential	B	Reid Rd	45	L2	-L-	238	-	-	* 71	** + 26
D02	Residential	B	Indian Trail/Fairview	45	L2	-L-	272	-	-	* 69	** + 24
D03	Residential	B	Reid Rd	45	L2	-L-	382	-	-	65	** + 20
D04	Residential	B	Reid Rd	45	L2	-L-	262	-	-	* 70	** + 25
D05	Residential	B	Oakland Ave	45	L2	-L-	420	-	-	64	** + 19
D06	Residential	B	Oakland Ave	45	L2	-L-	258	-	-	* 70	** + 25
D07	Residential	B	Oakland Ave	45	L2	-L-	374	-	-	65	** + 20
D08	Residential	B	Oakland Ave	45	L2	-L-	308	-	-	* 68	** + 23
D09	Residential	B	Oakland Ave	45	L2	-L-	255	-	-	* 70	** + 25
D10	Residential	B	Oakland Ave	45	L2	-L-	357	-	-	* 66	** + 21
D11	Residential	B	Oakland Ave	45	L2	-L-	169	-	-	* 74	** + 29
D12	Residential	B	Beverly Dr	45	L2	-L-	386	-	-	65	** + 20
D13	Residential	B	Beverly Dr	45	L2	-L-	371	-	-	65	** + 20
D14	Residential	B	Beverly Dr	45	L2	-L-	252	-	-	* 70	** + 25
D15	Residential	B	Beverly Dr	45	L2	-L-	363	-	-	* 66	** + 21
D16	Residential	B	Beverly Dr	45	L2	-L-	317	-	-	* 67	** + 22
D17	Residential	B	Beverly Dr	45	L2	-L-	215	-	-	* 72	** + 27
D18	Residential	B	Beverly Dr	45	L2	-L-	250	-	-	* 70	** + 25
D41	Residential	B	Reid Rd	45	L2	-L-	540	-	-	61	** + 16
D42	Residential	B	Oakland Ave	45	L2	-L-	506	-	-	62	** + 17
D43	Residential	B	Beverly Dr	45	L2	-L-	541	-	-	61	** + 16
D44	Residential	B	Oakland Ave	45	L2	-L-	502	-	-	62	** + 17
D45	Residential	B	Oakland Ave	45	L2	-L-	564	-	-	61	** + 16
D46	Residential	B	Beverly Dr	45	L2	-L-	497	-	-	62	** + 17
D47	Residential	B	Beverly Dr	45	L2	-L-	534	-	-	61	** + 16
D19	Residential	B	Beverly Dr	47	L21	-L-	205	-	-	* 72	** + 25
D20	Residential	B	Beverly Dr	50	L21	-L-	253	-	-	* 70	** + 20
D21	Commercial	C	Secrest Short Cut Rd	50	L21	-L-	183	-	-	* 73	** + 23
D22	Residential	B	Secrest Short Cut Rd	55	L21	-L-	285	-	-	* 69	** + 14
D23	Commercial	C	Secrest Short Cut Rd	49	L21	-L-	328	-	-	67	** + 18
D24	Residential	B	Secrest Short Cut Rd	55	L21	-L-	196	-	-	* 73	** + 18
D25	Residential	B	Secrest Short Cut Rd	55	L21	-L-	268	-	-	* 69	** + 14
D26	Residential	B	Secrest Short Cut Rd	51	L21	-L-	210	-	-	* 72	** + 21
D27	Residential	B	Secrest Short Cut Rd	55	L21	-L-	234	-	-	* 71	** + 16
D28	Residential	B	Secrest Short Cut Rd	55	L21	-L-	367	-	-	65	** + 10
D29	Residential	B	Secrest Short Cut Rd	55	L21	-L-	208	-	-	* 72	** + 17
D30	Residential	B	Secrest Short Cut Rd	55	L21	-L-	275	-	-	* 69	** + 14
D31	Residential	B	Secrest Short Cut Rd	51	L21	-L-	202	-	-	* 72	** + 21
D32	Residential	B	Faith Church Rd	45	L21	-L-	389	-	-	65	** + 20
D33	Residential	B	Faith Church Rd	49	L21	-L-	342	-	-	* 66	** + 17
D34	Residential	B	Faith Church Rd	51	L21	-L-	362	-	-	* 66	** + 15
D35	Residential	B	Faith Church Rd	49	L21	-L-	428	-	-	64	** + 15
D36	Residential	B	Faith Church Rd	45	L21	-L-	206	-	-	* 72	** + 27
D48	Residential	B	Beverly Dr	52	L21	-L-	436	-	-	63	+ 11
D49	Residential	B	Secrest Short Cut Rd	53	L21	-L-	387	-	-	65	** + 12
D50	Residential	B	Secrest Short Cut Rd	51	L21	-L-	508	-	-	62	+ 11
D51	Residential	B	Faith Church Rd	49	L21	-L-	542	-	-	61	+ 12
D52	Residential	B	Secrest Short Cut Rd	45	L21	-L-	518	-	-	62	** + 17
D53	Residential	B	Southwind Trail Dr	55	L21	-L-	523	-	-	62	+ 7
D54	Residential	B	Southwind Trail Dr	51	L21	-L-	598	-	-	60	+ 9
D55	Residential	B	Southwind Trail Dr	55	L21	-L-	493	-	-	62	+ 7
D56	Residential	B	Southwind Trail Dr	51	L21	-L-	551	-	-	61	+ 10
D57	Commercial	C	Secrest Short Cut Rd	46	L30	-L-	421	-	-	64	** + 18
D58	Residential	B	Secrest Short Cut Rd	47	L30	-L-	550	-	-	61	+ 14
D59	Residential	B	Secrest Short Cut Rd	48	L30	-L-	514	-	-	62	+ 14
D60	Residential	B	Poplin Road	50	L30	-L-	450	-	-	63	+ 13
D37	Residential	B	Secrest Short Cut Rd	51	L30	-L-	242	-	-	* 71	** + 20
D38	Residential	B	Secrest Short Cut Rd	53	L30	-L-	412	-	-	64	+ 11
D39	Residential	B	Secrest Short Cut Rd	51	L30	-L-	283	-	-	* 69	** + 18
D40	Residential	B	Secrest Short Cut Rd	45	L30	-L-	384	-	-	65	** + 20

1. D-M = Distance from roadway centerline. R0 = Distance from centerline to middle of outside lane.
2. The -L- column lists the noise level results from the TNM contour models.
3. Ambient noise level estimated based on measurements of existing noise levels at locations with similar land use/traffic conditions.
   The minimum ambient noise level is 45 dBA Leq.
4. "*" denotes a noise impact per 23 CFR 772 .
5. "**" denotes a substantial noise level increase per NCDOT Traffic Noise Abatement Policy.

INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0

INPUTS FOR FUTURE NOISE LEVELS[1,2]

D-M	-L- Unionvlle - R. River	N/A PRD # 2	N/A PRD # 3
72	82.5	0.0	0.0
97	79.6	0.0	0.0
147	76.3	0.0	0.0
247	71.3	0.0	0.0
447	63.8	0.0	0.0
847	58.0	0.0	0.0
1647	50.0	0.0	0.0
R0	41.0	0.0	0.0

NOISE CONTOURS	DISTANCE TO CL
72	222.1
67	338.2
66	366.9
50	0.0
DESIRED	
55	1077.5
dBA ^	

Minimum Right-of-way Distance From CL: 150

---------- R/W ----------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL[3]	NEAREST PROPOSED ROADWAY Segment	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM[4]	NOISE LEVEL INCREASE[4]
E05	Residential	B	Secrest Short Cut Rd	45	L30	-L-	470	-	-	63	** + 18
E06	Residential	B	Rocky River Rd	45	L30	-L-	392	-	-	65	** + 20
E07	Residential	B	Secrest Short Cut Rd	46	L30	-L-	586	-	-	61	** + 15
E08	Residential	B	Secrest Short Cut Rd	46	L30	-L-	654	-	-	60	+ 14
E09	Residential	B	Secrest Short Cut Rd	45	L30	-L-	547	-	-	61	** + 16
E10	Residential	B	Secrest Short Cut Rd	45	L30	-L-	614	-	-	60	** + 15
E14	Residential	B	Rocky River Rd	55	L30	-L-	656	-	-	60	+ 5
E15	Residential	B	Rocky River Rd	55	L30	-L-	548	-	-	61	+ 6
E16	Residential	B	Rocky River Rd	55	L30	-L-	439	-	-	63	+ 8
E17	Residential	B	Unionville Indian Trail	51	L30	-L-	325	-	-	* 67	** + 16
E18	Residential	B	Secrest Short Cut Rd	51	L30	-L-	520	-	-	62	+ 11
E19	Residential	B	Secrest Short Cut Rd	51	L30	-L-	492	-	-	62	+ 11

1. D-M = Distance from roadway centerline. R0 = Distance from centerline to middle of outside lane.
2. The -L- column lists the noise level results from the TNM contour models.
3. Ambient noise level estimated based on measurements of existing noise levels at locations with similar land use/traffic conditions.
   The minimum ambient noise level is 45 dBA Leq.
4. "*" denotes a noise impact per 23 CFR 772 .
5. "**" denotes a substantial noise level increase per NCDOT Traffic Noise Abatement Policy.

INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0

INPUTS FOR FUTURE NOISE LEVELS[1,2]

D-M	-L- R. River - US601	N/A PRD # 2	N/A PRD # 3
72	82.0	0.0	0.0
97	79.1	0.0	0.0
147	75.8	0.0	0.0
247	70.8	0.0	0.0
447	63.3	0.0	0.0
847	57.5	0.0	0.0
1647	49.5	0.0	0.0
R0	41.0	0.0	0.0

NOISE CONTOURS	DISTANCE TO CL
72	210.0
67	324.8
66	352.2
50	1569.8
DESIRED	
55	1033.8
dBA ^	

Minimum Right-of-way Distance From CL: 150

---------- R/W ----------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL[3]	NEAREST PROPOSED ROADWAY Segment	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM	NOISE LEVEL INCREASE[4]
F05	Residential	B	Willis Long Rd	45	L30	-L-	139	-	-	R/W	-
F06	Residential	B	Willis Long Rd	45	L30	-L-	223	-	-	* 71	** + 26
F07	Residential	B	Clear Creek Dr	45	L30	-L-	309	-	-	* 67	** + 22
F08	Residential	B	Clear Creek Dr	45	L30	-L-	280	-	-	* 68	** + 23
F09	Residential	B	Clear Creek Dr	45	L30	-L-	213	-	-	* 71	** + 26
F10	Residential	B	Clear Creek Dr	45	L30	-L-	341	-	-	* 66	** + 21
F11	Residential	B	Poplin Rd	48	L30	-L-	423	-	-	63	** + 15
F12	Residential	B	Poplin Rd	48	L30	-L-	303	-	-	* 67	** + 19
F13	Residential	B	Poplin Rd	51	L30	-L-	443	-	-	63	+ 12
F14	Residential	B	Poplin Rd	51	L30	-L-	371	-	-	65	** + 14
F15	Residential	B	Roanoke Church Rd	51	L30	-L-	340	-	-	* 66	** + 15
F16	Residential	B	Roanoke Church Rd	45	L30	-L-	452	-	-	63	** + 18
F17	Residential	B	Dusty Hollow Rd	45	L31	-L-	276	-	-	* 69	** + 24
F18	Residential	B	Dusty Hollow Rd	45	L31	-L-	232	-	-	* 71	** + 26
F19	Residential	B	Dusty Hollow Rd	45	L31	-L-	270	-	-	* 69	** + 24
F20	Residential	B	Dusty Hollow Rd	45	L31	-L-	351	-	-	* 66	** + 21
F21	Residential	B	Back Rd	45	L31	-L-	391	-	-	64	** + 19
F22	Residential	B	Back Rd	45	L30	-L-	402	-	-	64	** + 19
F23	Residential	B	Wallace Rd	45	L31	-L-	341	-	-	* 66	** + 21
F24	Residential	B	Wallace Rd	45	L31	-L-	301	-	-	* 67	** + 22
F25	Residential	B	Fowler Rd	45	L31	-L-	357	-	-	65	** + 20
F26	Residential	B	Fowler Rd	51	L31	-L-	375	-	-	65	** + 14
F27	Residential	B	Fowler Rd	45	L31	-L-	229	-	-	* 71	** + 26
F28	Residential	B	Fowler Rd	48	L31	-L-	340	-	-	* 66	** + 18
F29	Residential	B	Maple Hill Rd	45	L31	-L-	225	-	-	* 71	** + 26
F30	Residential	B	Maple Hill Rd	45	L31	-L-	293	-	-	* 68	** + 23
F31	Residential	B	Maple Hill Rd	45	L31	-L-	328	-	-	* 66	** + 21
F32	Residential	B	Rocky River Rd	45	L30	-L-	422	-	-	63	** + 18
F33	Residential	B	Willis Long Rd	48	L30	-L-	289	-	-	* 68	** + 20
F34	Residential	B	Willis Long Rd	45	L30	-L-	106	-	-	R/W	-
F37	Residential	B	Secrest Shortcut	45	L30	-L-	477	-	-	62	** + 17
F38	Residential	B	Dusty Hollow Rd	45	L31	-L-	461	-	-	62	** + 17
F39	Residential	B	Dusty Hollow Rd	45	L31	-L-	542	-	-	61	** + 16
F40	Residential	B	Dusty Hollow Rd	45	L31	-L-	475	-	-	62	** + 17
F41	Residential	B	Back Rd	45	L31	-L-	488	-	-	62	** + 17
F42	Residential	B	Back Rd	45	L31	-L-	550	-	-	61	** + 16
F43	Residential	B	Wallace Rd	45	L31	-L-	539	-	-	61	** + 16
F44	Residential	B	Wallace Rd	45	L31	-L-	545	-	-	61	** + 16
F45	Residential	B	Wallace Rd	45	L31	-L-	456	-	-	62	** + 17
F46	Residential	B	Dusty Hollow Rd	45	L31	-L-	456	-	-	62	** + 17
F47	Residential	B	Courtney Store Rd	45	L31	-L-	288	-	-	* 68	** + 23

1. D-M = Distance from roadway centerline. R0 = Distance from centerline to middle of outside lane.
2. The -L- column lists the noise level results from the TNM contour models.
3. Ambient noise level estimated based on measurements of existing noise levels at locations with similar land use/traffic conditions. The minimum ambient noise level is 45 dBA Leq.
4. "*" denotes a noise impact per 23 CFR 772 .
5. "**" deontes a substantial noise level increase per NCDOT Traffic Noise Abatement Policy.

INPUTS FOR AMBIENT NOISE LEVELS			
		N/A	BACKGROUND
D-M	AMB # 1	AMB # 2	NOISE LEVEL
25	0.0	0.0	FOR AREA
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0

INPUTS FOR FUTURE NOISE LEVELS[1,2]				NOISE		DISTANCE	Minimum
	-L-	N/A	N/A	CONTOURS		TO CL	Right-of-way
D-M	US601 - NC200	PRD # 2	PRD # 3	72		184.2	Distance
72	80.8	0.0	0.0	67		294.3	From CL
97	77.9	0.0	0.0	66		318.4	150
147	74.6	0.0	0.0	50		1419.3	
247	69.6	0.0	0.0	DESIRED			
447	62.0	0.0	0.0	55		936.0	
847	56.3	0.0	0.0	dBA ^			
1647	48.3	0.0	0.0				
R0	41.0	0.0	0.0				

---------- R/W ----------

RECEPTOR INFORMATION			NEAREST EXISTING	AMBIENT NOISE	NEAREST PROPOSED ROADWAY			PREDICTED NOISE LEVELS			NOISE LEVEL
ID#	LAND USE	CATEGORY	ROADWAY	LEVEL[3]	Segment	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM	INCREASE[4]
G01	Residential	B	Deese Rd	46	L31	-L-	297	-	-	* 66	** + 20
G02	Residential	B	Deese Rd	45	L31	-L-	287	-	-	* 67	** + 22
G03	Residential	B	gravel dr off gravel dr	45	L36	-L-	341	-	-	65	** + 20
G06	Residential	B	Deese Rd	46	L31	-L-	464	-	-	61	** + 15

1. D-M = Distance from roadway centerline. R0 = Distance from centerline to middle of outside lane.
2. The -L- column lists the noise level results from the TNM contour models.
3. Ambient noise level estimated based on measurements of existing noise levels at locations with similar land use/traffic conditions. The minimum ambient noise level is 45 dBA Leq.
4. "*" denotes a noise impact per 23 CFR 772 .
5. "**" deontes a substantial noise level increase per NCDOT Traffic Noise Abatement Policy.

INPUTS FOR AMBIENT NOISE LEVELS			
		N/A	BACKGROUND
D-M	AMB # 1	AMB # 2	NOISE LEVEL
25	0.0	0.0	FOR AREA
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0

INPUTS FOR FUTURE NOISE LEVELS[1,2]				NOISE CONTOURS		DISTANCE TO CL	Minimum Right-of-way Distance From CL
	-L-	N/A	N/A				
D-M	NC200 - A. Chaney	PRD # 2	PRD # 3	72		157.4	
72	79.3	0.0	0.0	67		262.0	
97	76.4	0.0	0.0	66		283.1	150
147	73.1	0.0	0.0	50		1247.6	
247	68.1	0.0	0.0	DESIRED			
447	60.5	0.0	0.0	55		811.1	
847	54.7	0.0	0.0	dBA ^			
1647	46.8	0.0	0.0				
R0	41.0	0.0	0.0				

---------- R/W ----------

RECEPTOR INFORMATION			NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL[3]	NEAREST PROPOSED ROADWAY			PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE[4]
ID#	LAND USE	CATEGORY			Segment	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM[4]	
H08	Residential	B	Olive Branch Rd	56	L36	-L-	265	-	-	* 66	** + 10
H10	Residential	B	Olive Branch Rd	45	L36	-L-	383	-	-	62	** + 17
I30	Residential	B	Old Williams Rd	46	L36	-L-	231	-	-	* 68	** + 22
I33	Residential	B	Funderburk Rd	45	L36	-L-	620	-	-	57	+ 12
I32	Residential	B	Austin Chaney	47	L36	-L-	467	-	-	59	+ 12

1. D-M = Distance from roadway centerline. R0 = Distance from centerline to middle of outside lane.
2. The -L- column lists the noise level results from the TNM contour models.
3. Ambient noise level estimated based on measurements of existing noise levels at locations with similar land use/traffic conditions.
   The minimum ambient noise level is 45 dBA Leq.
4. "*" denotes a noise impact per 23 CFR 772 .
5. "**" denotes a substantial noise level increase per NCDOT Traffic Noise Abatement Policy.

INPUTS FOR AMBIENT NOISE LEVELS			
		N/A	BACKGROUND
D-M	AMB # 1	AMB # 2	NOISE LEVEL
25	0.0	0.0	FOR AREA
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0

INPUTS FOR FUTURE NOISE LEVELS[1,2]				NOISE CONTOURS		DISTANCE TO CL	Minimum Right-of-way Distance From CL
	-L-	N/A	N/A				
D-M	NC200 - A. Chaney	PRD # 2	PRD # 3	72		157.4	
72	79.3	0.0	0.0	67		262.0	
97	76.4	0.0	0.0	66		283.1	150
147	73.1	0.0	0.0	50		1247.6	
247	68.1	0.0	0.0	DESIRED			
447	60.5	0.0	0.0	55		811.1	
847	54.7	0.0	0.0	dBA ^			
1647	46.8	0.0	0.0				
R0	41.0	0.0	0.0				

---------- R/W ----------

RECEPTOR INFORMATION			NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL[3]	NEAREST PROPOSED ROADWAY			PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE[4]
ID#	LAND USE	CATEGORY			Segment	NAME	CL DIST(ft)	-L-	-Y-	MAXIMUM[4]	
H08	Residential	B	Olive Branch Rd	56	L36	-L-	265	-	-	* 66	** + 10
H10	Residential	B	Olive Branch Rd	45	L36	-L-	383	-	-	62	** + 17
I30	Residential	B	Old Williams Rd	46	L36	-L-	231	-	-	* 68	** + 22
I33	Residential	B	Funderburk Rd	45	L36	-L-	620	-	-	57	+ 12
I32	Residential	B	Austin Chaney	47	L36	-L-	467	-	-	59	+ 12

1. D-M = Distance from roadway centerline. R0 = Distance from centerline to middle of outside lane.
2. The -L- column lists the noise level results from the TNM contour models.
3. Ambient noise level estimated based on measurements of existing noise levels at locations with similar land use/traffic conditions.
   The minimum ambient noise level is 45 dBA Leq.
4. "*" denotes a noise impact per 23 CFR 772 .
5. "**" denotes a substantial noise level increase per NCDOT Traffic Noise Abatement Policy.

INPUTS FOR AMBIENT NOISE LEVELS

D-M	AMB # 1	N/A AMB # 2	BACKGROUND NOISE LEVEL FOR AREA
25	0.0	0.0	
50	0.0	0.0	45.0
100	0.0	0.0	
200	0.0	0.0	
400	0.0	0.0	
800	0.0	0.0	
1600	0.0	0.0	
R0	0.0	0.0	

Direction of CL Shift R or L	Distance of CL Shift in Feet
R	0

INPUTS FOR FUTURE NOISE LEVELS[1,2]

D-M	-L- A. Chaney - F. Hills	N/A PRD # 2	N/A PRD # 3	NOISE CONTOURS
72	78.3	0.0	0.0	72
97	75.4	0.0	0.0	67
147	72.1	0.0	0.0	66
247	67.2	0.0	0.0	50
447	59.6	0.0	0.0	DESIRED
847	53.8	0.0	0.0	55
1647	45.9	0.0	0.0	dBA ^
R0	41.0	0.0	0.0	

DISTANCE TO CL
142.4
244.7
264.0
1156.3
732.8

Minimum Right-of-way Distance From CL
150

---------- R/W ----------

RECEPTOR INFORMATION ID#	LAND USE	CATEGORY	NEAREST EXISTING ROADWAY	AMBIENT NOISE LEVEL[3]	NEAREST PROPOSED ROADWAY Segment	NAME	CL DIST(ft)	PREDICTED NOISE LEVELS -L-	-Y-	MAXIMUM[4]	NOISE LEVEL INCREASE[4]
I02	Residential	B	Douglas Dr	45	L36	-L-	263	-	-	* 66	** + 21
I03	Residential	B	Douglas Dr	45	L36	-L-	299	-	-	64	** + 19
I04	Residential	B	Phifer Cir	45	L40	-L-	313	-	-	63	** + 18
I05	Residential	B	Glencroft Dr	52	L40	-L-	550	-	-	57	+ 5
I06	Residential	B	Glencroft Dr	48	L40	-L-	532	-	-	57	+ 9
I07	Residential	B	Glencroft Dr	46	L40	-L-	526	-	-	57	+ 11
I08	Residential	B	Glencroft Dr	45	L40	-L-	512	-	-	58	+ 13
I09	Residential	B	Glencroft Dr	45	L40	-L-	500	-	-	58	+ 13
I10	Residential	B	Glencroft Dr	45	L40	-L-	485	-	-	58	+ 13
I11	Residential	B	Glencroft Dr	45	L40	-L-	478	-	-	58	+ 13
I12	Residential	B	Glencroft Dr	45	L40	-L-	470	-	-	59	+ 14
I13	Residential	B	Glencroft Dr	45	L40	-L-	461	-	-	59	+ 14
I14	Residential	B	Glencroft Dr	45	L40	-L-	449	-	-	59	+ 14
I15	Residential	B	Glencroft Dr	45	L40	-L-	436	-	-	59	+ 14
I16	Residential	B	Glencroft Dr	45	L40	-L-	430	-	-	59	+ 14
I17	Residential	B	Glencroft Dr	45	L40	-L-	427	-	-	59	+ 14
I18	Residential	B	Glencroft Dr	45	L40	-L-	420	-	-	60	
I19	Residential	B	Glencroft Dr	45	L40	-L-	425	-	-	60	** + 15
I20	Residential	B	Glencroft Dr	45	L40	-L-	419	-	-	60	** + 15
I21	Residential	B	Glencroft Dr	45	L40	-L-	419	-	-	60	** + 15
I22	Residential	B	Glencroft Dr	45	L40	-L-	403	-	-	60	** + 15
I23	Residential	B	Glencroft Dr	45	L40	-L-	391	-	-	61	** + 16
I24	Residential	B	Glencroft Dr	45	L40	-L-	395	-	-	60	** + 15
I25	Residential	B	Glencroft Dr	45	L40	-L-	387	-	-	61	** + 16
I26	Residential	B	Glencroft Dr	45	L40	-L-	388	-	-	61	** + 16
I29	Residential	B	Phifer Cir	45	L40	-L-	376	-	-	61	** + 16
I28	Residential	B	Phifer Cir	45	L40	-L-	371	-	-	61	** + 16
I31	Residential	B	McIntyre Rd	46	L40	-L-	422	-	-	60	+ 14

1. D-M = Distance from roadway centerline. R0 = Distance from centerline to middle of outside lane.
2. The -L- column lists the noise level results from the TNM contour models.
3. Ambient noise level estimated based on measurements of existing noise levels at locations with similar land use/traffic conditions.
   The minimum ambient noise level is 45 dBA Leq.
4. "*" denotes a noise impact per 23 CFR 772 .
5. "**" denotes a substantial noise level increase per NCDOT Traffic Noise Abatement Policy.

APPENDIX D

BARRIER EVALUATION AREA RESULTS

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Table D1
Barrier Evaluation N1

RECEPTOR INFORMATION			Project	Nearest Existing	Ambient	Nearest Proposed Roadway		Predicted Noise			Noise Level	Barrier Height/	Insertion
ID #	Land Use	Category	Segment	Roadway	Noise Level[a]	Name	Distance (ft)		Level		Increase[b]	Noise Level with Barrier	Loss
B02	Commercial	C	L2	Independence Blvd	65	WB Monroe Bypass	350		64		-1		
A05	Commercial	C	L2	Independence Blvd	65	WB Monroe Bypass	169	*	75		▲ 10	Isolated	
A06	Commercial	C	L2	Independence Blvd	65	WB Monroe Bypass	184		70		5		
A07	Commercial	C	L2	Independence Blvd	65	WB Monroe Bypass	187		69		4		
A08	Commercial	C	L2	Independence Blvd	65	WB Monroe Bypass	162		69		4		
A09	Commercial	C	L2	Independence Blvd	65	WB Monroe Bypass	155		70		5		
A10	Commercial	C	L2	Independence Blvd	65	WB Monroe Bypass	162		69		4		
A11	Commercial	C	L2	Independence Blvd	65	EB Monroe Bypass	160		69		4		
A12	Commercial	C	L2	Independence Blvd	65	EB Monroe Bypass	159		69		4		
A13	Commercial	C	L2	Independence Blvd	65	WB Monroe Bypass	178		69		4		
A14	Commercial	C	L2	Independence Blvd	65	WB Monroe Bypass	166		69		4		
A15	Commercial	C	L2	Independence Blvd	65	EB Monroe Bypass	162		69		4		
A16	Commercial	C	L2	Independence Blvd	65	EB Monroe Bypass	156	*	71		6	Isolated	
A17	Commercial	C	L2	Independence Blvd	65	EB Monroe Bypass	163		68		3		
A18	Commercial	C	L2	Independence Blvd	65	EB Monroe Bypass	163	*	71		6	Isolated	
A19	Commercial	C	L2	Independence Blvd	65	EB Monroe Bypass	182		68		3		
A20	Commercial	C	L2	Independence Blvd	65	EB Monroe Bypass	179		68		3		
A21	Residential	B	L2	Independence Blvd	60	EB Monroe Bypass	291	*	69		9	Isolated	
A22	Commercial	C	L2	Independence Blvd	62	EB Monroe Bypass	400		63		1		

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

[d] Noise level decreases unrelated to noise barriers may occur due to existing roadway realignments.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase as defined in NCDOT's 2004 Traffic Noise Abatement Policy

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

Table D2
Barrier Evaluation N2

RECEPTOR INFORMATION			Project	Nearest Existing	Ambient	Nearest Proposed Roadway		Predicted Noise	Noise Level	Barrier Height/	Insertion
ID #	Land Use	Category	Segment	Roadway	Noise Level[a]	Name	Distance (ft)	Level	Increase[b]	Noise Level with Barrier	Loss
										Barrier 2-1 (Not Reasonable)	
C29	Residential	B	L2	Pine Tree Dr	54	WB Monroe Bypass	474	65	▲ 11	60	-5
C30	Residential	B	L2	Pine Tree Dr	54	WB Monroe Bypass	460	65	▲ 11	60	-5
C31	Residential	B	L2	Pine Tree Dr	54	WB Monroe Bypass	478	65	▲ 11	59	-6
C32	Residential	B	L2	Pine Tree Dr	54	WB Monroe Bypass	480	65	▲ 11	59	-6
C33	Residential	B	L2	Pine Tree Dr	54	WB Monroe Bypass	482	64	10	59	-5
C34	Residential	B	L2	Pine Tree Dr	54	WB Monroe Bypass	492	64	10	59	-5
C35	Residential	B	L2	Pine Tree Dr	54	WB Monroe Bypass	584	63	9	57	-6
C36	Residential	B	L2	Pine Tree Dr	54	WB Monroe Bypass	682	62	8	57	-5
C09	Residential	B	L2	Forest Park Rd	54	WB Monroe Bypass	466	65	▲ 11	58	-7
C10	Residential	B	L2	Forest Park Rd	54	WB Monroe Bypass	460	64	10	57	-7
C11	Commercial	C	L2	Union West Blvd	53	WB Monroe Bypass	486	64	11		
										Barrier 2-2a (Not Reasonable)	
C12	Residential	B	L2	Sherin Ln	51	WB Monroe Bypass	347	* 66	▲ 15	64	-2
C13	Commercial	C	L2	Union West Blvd	51	WB Monroe Bypass	238	67	▲ 16	61	-6
C40	Commercial	C	L2	Union West Blvd	45	WB Monroe Bypass	470	63	▲ 18	60	-3
C41	Residential	B	L2	Sherrin Ln	45	WB Monroe Bypass	571	62	▲ 17	58	-4
C42	Residential	B	L2	Sherrin Ln	45	WB Monroe Bypass	489	63	▲ 18	58	-5
C16	Residential	B	L2	Sherrin Ln	45	WB Monroe Bypass	445	65	▲ 20	59	-6
C43	Residential	B	L2	White Oak Ln	45	WB Monroe Bypass	588	61	▲ 16	57	-4
C44	Residential	B	L2	White Oak Ln	45	WB Monroe Bypass	535	63	▲ 18	57	-6
C45	Residential	B	L2	White Oak Ln	45	WB Monroe Bypass	438	64	▲ 19	59	-5
C46	Residential	B	L2	White Oak Ln	45	WB Monroe Bypass	512	63	▲ 18	58	-5
C21	Residential	B	L2	Oscar Robinson	45	WB Monroe Bypass	307	* 68	▲ 23	62	-6
										Barrier 2-2b (Not Reasonable)	
C23	Residential	B	L2	Strand Dr	45	WB Monroe Bypass	327	* 66	▲ 21	61	-5
C24	Residential	B	L2	Strand Dr	45	WB Monroe Bypass	193	* 74	▲ 29	65	-9
C25	Residential	B	L2	Oak Spring Rd	45	WB Monroe Bypass	189	* 74	▲ 29	65	-9
C26	Residential	B	L2	Oak Spring Rd	45	WB Monroe Bypass	431	64	▲ 19	61	-3
C15	Commercial	C	L2	Union West Blvd	49	EB Monroe Bypass	352	66	▲ 17		
C47	Commercial	C	L2	Van Buren Ave	45	EB Monroe Bypass	496	60	▲ 15		
										Barrier 2-3a (Not Reasonable)	
C14	Commercial	C	L2	Independence Blvd	56	EB Monroe Bypass	244	68	▲ 12	60	-8
C37	Commercial	C	L2	Van Buren Ave	57	EB Monroe Bypass	389	66	9	63	-3
C38	Commercial	C	L2	Van Buren Ave	56	EB Monroe Bypass	394	66	▲ 10	62	-4
C39	Commercial	C	L2	Van Buren Ave	53	EB Monroe Bypass	393	66	▲ 13	59	-7
										Barrier 2-3b (Not Reasonable)	
C17	Commercial	C	L2	Van Buren Ave	45	EB Monroe Bypass	384	65	▲ 20	60	-5
C18	Commercial	C	L2	Van Buren Ave	45	EB Monroe Bypass	289	68	▲ 23	61	-7
C19	Commercial	C	L2	Van Buren Ave	45	EB Monroe Bypass	272	70	▲ 25	65	-5
C20	Commercial	C	L2	Van Buren Ave	45	EB Monroe Bypass	223	* 72	▲ 27	64	-8
C22	Commercial	C	L2	Van Buren Ave	45	EB Monroe Bypass	191	* 72	▲ 27	63	-9

Table D2
Barrier Evaluation N2

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

[d] Noise level decreases unrelated to noise barriers may occur due to existing roadway realignments.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase as defined in NCDOT's 2004 Traffic Noise Abatement Policy

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

Table D3
BEA N2: Barrier Reasonableness Summary

Barrier ID	Number of Impacted Receptors Benefited	Base Allowance for Barrier	Average Decibel Increase	Barrier Cost Adjustment for Avg dB Increase	Allowable Cost for Impacted Receptors	[1] Other Benefited Receptors	Allowable Cost for Other Benefited Receptors	Total Allowable Cost	Allowable Cost per Receptor	Proposed Barrier Dimensions				Barrier Cost	Cost per Benefited Receptor	Reasonable? Yes/No
										Height (feet)	Linear (feet)	Approximate Stations	Area of Barrier Square Feet			
BEA 2-1	5	$ 175,000	11	$ 27,500	$ 202,500	5	$ 175,000	$ 377,500	$ 37,750	12	1,997	43.5 to 38	23,964			
(2 Barriers)										12	900	48 to 30	10,800			
											2,897		34,764	$521,460	$52,146	No
BEA 2-2a	7	$ 245,000	19	$ 66,500	$ 311,500	0	$ -	$ 311,500	$ 44,500	16	2,553	191 to 217	40,848			
											2,553		40,848	$612,720	$87,531	No
BEA 2-2b	3	$ 105,000	26	$ 39,000	$ 144,000	0	$ -	$ 144,000	$ 48,000	10	593	221 to 224	5,930			
										12	888	224 to 233	10,656			
											1,481		16,586	$248,790	$82,930	No
BEA 2-3a	2	$ 70,000	20	$ 20,000	$ 90,000	0	$ -	$ 90,000	$ 45,000	22	1,211	Ramp 15 to Ramp 0	26,642			
											1,211		26,642	$399,630	$199,815	No
BEA 2-3b	5	$ 175,000	24	$ 60,000	$ 235,000	0	$ -	$ 235,000	$ 47,000	14	898	205 to 212	12,572			
										10	943	212 to 222	9,430			
											1,841		22,002	$330,030	$66,006	No

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier.

Notes: Assumptions based on the NCDOT Traffic Noise Abatement Policy:

$ 35,000 = Cost effectiveness threshold ($/benefiting Receptor)

$ 500 = Adjustment per average decibel increase for impacted receptors.

$ 15 = Assume Barrier Cost ($/sf)

Table D4
Barrier Evaluation Area N4

RECEPTOR INFORMATION			Project	Nearest Existing	Ambient	Nearest Proposed Roadway		Predicted Noise Level			Noise Level	Barrier Height/ Noise Level	Insertion
ID #	Land Use	Category	Segment	Roadway	Noise Level[a]	Name	Distance (ft)				Increase[b]	with Barrier	Loss
												N4-1 16ft Barrier (Reasonable)	
D01	Residential	B	L18A	Reid Rd	45	Monroe Bypass EB	328	*	68		▲ 23	57	-11
D03	Residential	B	L18A	Indian Trail Fairview	45	Monroe Bypass EB	322	*	66		▲ 21	58	-8
D04	Residential	B	L18A	Reid Rd	45	Monroe Bypass EB	170	*	67		▲ 22	57	-10
D05	Residential	B	L18A	Reid Rd	45	Monroe Bypass EB	260		64		▲ 19	55	-9
D06	Residential	B	L18A	Oakland Ave	45	Monroe Bypass EB	304	*	66		▲ 21	57	-9
D07	Residential	B	L18A	Oakland Ave	45	Monroe Bypass EB	211	*	66		▲ 21	57	-9
D08	Residential	B	L18A	Oakland Ave	45	Monroe Bypass EB	402	*	67		▲ 22	57	-10
D09	Residential	B	L18A	Oakland Ave	45	Monroe Bypass EB	255	*	68		▲ 23	58	-10
D11	Residential	B	L18A	Oak Spring Rd	45	Monroe Bypass EB	169	*	69		▲ 24	59	-10
D12	Residential	B	L18A	Beverly Dr	45	Monroe Bypass EB	386		65		▲ 20	56	-9
D41	Residential	B	L18A	Reid Rd	45	Monroe Bypass EB	540		64		▲ 19	58	-6
D42	Residential	B	L18A	Oakland Ave	45	Monroe Bypass EB	506		64		▲ 19	56	-8
D43	Residential	B	L18A	Beverly Dr	45	Monroe Bypass EB	541		63		▲ 18	55	-8
D44	Residential	B	L18A	Oakland Ave	45	Monroe Bypass EB	502		63		▲ 18	55	-8
D45	Residential	B	L18A	Oakland Ave	45	Monroe Bypass EB	564		63		▲ 18	56	-7
D46	Residential	B	L18A	Beverly Dr	45	Monroe Bypass EB	497		63		▲ 18	55	-8
D16	Residential	B	L18A	Beverly Dr	45	Monroe Bypass EB	317		65		▲ 20	57	-8
D17	Residential	B	L18A	Beverly Dr	45	Monroe Bypass EB	215	*	71		▲ 26	60	-11
D18	Residential	B	L18A	Beverly Dr	45	Monroe Bypass EB	250	*	70		▲ 25	59	-11
D23	Commercial	C	L21	Secrest Short Cut Rd	49	Monroe Bypass EB	328		67		▲ 18	58	-9
D24	Residential	B	L21	Secrest Short Cut Rd	55	Monroe Bypass EB	196	*	70		▲ 15	60	-10
D27	Residential	B	L18A	Secrest Short Cut Rd	55	Monroe Bypass EB	527	*	70		▲ 15	64	-6
D28	Residential	B	L18A	Secrest Short Cut Rd	55	Monroe Bypass EB	531	*	68		▲ 13	64	-4
D29	Residential	B	L21	Secrest Short Cut Rd	55	Monroe Bypass EB	208	*	69		▲ 14	64	-5
D30	Residential	B	L21	Secrest Short Cut Rd	55	Monroe Bypass EB	275	*	67		▲ 12	62	-5
D31	Residential	B	L21	Secrest Short Cut Rd	51	Monroe Bypass EB	202	*	68		▲ 17	60	-8
D34	Residential	B	L21	Faith Church Rd	51	Monroe Bypass EB	362	*	68		▲ 17	62	-6
												N4-2 18/16/14 ft Barrier (Not Reasonable)	
D02	Residential	B	L18A	Indian Trail/Fairview	45	Monroe Bypass WB	328	*	69		▲ 24	64	-5
D10	Residential	B	L18A	Oakland Ave	45	Monroe Bypass WB	357		64		▲ 19	57	-7
D13	Residential	B	L18A	Beverly Dr	45	Monroe Bypass WB	371		65		▲ 20	57	-8
D14	Residential	B	L18A	Beverly Dr	45	Monroe Bypass WB	252	*	69		▲ 24	58	-11
D15	Residential	B	L18A	Beverly Dr	45	Monroe Bypass WB	363		64		▲ 19	56	-8
D47	Residential	B	L18A	Beverly Dr	45	Monroe Bypass WB	534		61		▲ 16	56	-6
D19	Residential	B	L21	Beverly Dr	47	Monroe Bypass WB	205	*	69		▲ 22	59	-10
D20	Residential	B	L21	Beverly Dr	50	Monroe Bypass WB	253	*	68		▲ 18	60	-8
D21	Commercial	C	L21	Secrest Short Cut Rd	50	Monroe Bypass WB	183		69		▲ 19	60	-9
D22	Residential	B	L21	Secrest Short Cut Rd	55	Monroe Bypass WB	285	*	68		▲ 13	63	-5
D25	Residential	B	L21	Secrest Short Cut Rd	55	Monroe Bypass WB	268	*	70		▲ 15	67	-3
D26	Residential	B	L21	Secrest Short Cut Rd	51	Monroe Bypass WB	210	*	68		▲ 17	60	-8
D48	Residential	B	L21	Beverly Dr	52	Monroe Bypass WB	436	*	66		▲ 14	60	-6
D49	Residential	B	L21	Secrest Short Cut Rd	53	Monroe Bypass WB	387	*	66		▲ 13	61	-5
D50	Residential	B	L21	Secrest Short Cut Rd	51	Monroe Bypass WB	508	*	66		▲ 15	62	-4
												N4-3 16/22/16/14 ft Barrier (Not Reasonable)	
D32	Residential	B	L21	Faith Church Rd	45	Monroe Bypass WB	389		63		▲ 18	57	-6
D33	Residential	B	L21	Faith Church Rd	49	Monroe Bypass WB	342	*	66		▲ 17	59	-7

Table D4
Barrier Evaluation Area N4

RECEPTOR INFORMATION			Project	Nearest Existing	Ambient	Nearest Proposed Roadway		Predicted Noise			Noise Level	Barrier Height/	Insertion
ID #	Land Use	Category	Segment	Roadway	Noise Level[a]	Name	Distance (ft)	Level			Increase[b]	Noise Level with Barrier	Loss
D35	Residential	B	L21	Faith Church Rd	49	Monroe Bypass WB	428	*	66		▲ 17	61	-5
D51	Residential	B	L21	Faith Church Rd	51	Monroe Bypass WB	542		63		12	58	-5
D36	Residential	B	L21	Faith Church Rd	45	Monroe Bypass WB	206		65		▲ 20	isolated	

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

[d] Noise level decreases unrelated to noise barriers may occur due to existing roadway realignments.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

▲ Denotes a substantial noise increase as defined in NCDOT's 2004 Traffic Noise Abatement Policy

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

Table D5
BEA N4: Barrier Reasonableness Summary

Barrier ID	Number of Impacted Receptors Benefited	Base Allowance for Barrier	Average Decibel Increase	Barrier Cost Adjustment for Avg dB Increase	Allowable Cost for Impacted Receptors	[1] Other Benefited Receptors	Allowable Cost for Other Benefited Receptors	Total Allowable Cost	Allowable Cost per Receptor	Proposed Barrier Dimensions				Barrier Cost	Cost per Benefited Receptor	Reasonable? Yes/No
										Height (feet)	Linear (feet)	Approximate Stations	Area of Barrier Square Feet			
N4-1	26	$ 910,000	19	$ 247,000	$ 1,157,000	0	$ -	$ 1,157,000	$ 44,500	16	4,699	343 to 390	75,184			
												TOTAL	75,184	$1,127,760	$43,375	Yes
N4-2	13	$ 455,000	18	$ 117,000	$ 572,000	0	$ -	$ 572,000	$ 44,000	18	2,215	299 to 375	39,870			
										16	406	295 to 299	6,496			
										14	500	290 to295	7,000			
											3,121	TOTAL	53,366	$800,490	$61,576	No
N4-3	3	$ 105,000	17	$ 25,500	$ 130,500	1	$ 35,000	$ 165,500	$ 41,375	16	299	393 to 396	4,784			
										22	718	385 to 393	15,796			
										16	290	383 to 385	4,640			
										14	311	380 to 383	4,354			
											1,618	TOTAL	29,574	$443,610	$110,903	No

1. Other Benefited Receptors - receptors not impacted by future noise, but still receive at least 5 dBA of attenuation from the barrier.

Notes: Assumptions based on the NCDOT Noise Abatement Policy:

$ 35,000 = Cost effectiveness threshold ($/benefiting receiver)

$ 500 = Adjustment per average decibel increase for impacted receptors.

$ 15 = Assume Barrier Cost ($/sf)

Table D6
Barrier Evaluation N5

RECEPTOR INFORMATION			Project	Nearest Existing	Ambient	Nearest Proposed Roadway		Predicted Noise	Noise Level	Barrier Height/	Insertion
ID #	Land Use	Category	Segment	Roadway	Noise Level[a]	Name	Distance (ft)	Level	Increase[b]	Noise Level with Barrier	Loss
D53	Residential	B	L21	Southwind Trail	55	EB Monroe Bypass	530	63	8		
D54	Residential	B	L21	Southwind Trail	51	EB Monroe Bypass	590	60	9		
D55	Residential	B	L21	Southwind Trail	55	EB Monroe Bypass	480	64	9		
D56	Residential	B	L21	Southwind Trail	51	EB Monroe Bypass	540	61	10		
D37	Residential	B	L22, L30	Secrest Short Cut Rd	51	EB Monroe Bypass	242	62	11		
D38	Residential	B	L22, L30	Secrest Short Cut Rd	53	EB Monroe Bypass	412	65	▲ 12	Isolated	
D39	Residential	B	L22, L30	Secrest Short Cut Rd	51	EB Monroe Bypass	283	63	12		
D57	Commercial	C	L22, L30	Secrest Short Cut Rd	53	EB Monroe Bypass	360	62	9		
D58	Residential	B	L22, L30	Secrest Short Cut Rd	54	EB Monroe Bypass	520	61	7		
D59	Residential	B	L22, L30	Secrest Short Cut Rd	55	EB Monroe Bypass	460	61	6		
E17	Residential	B	L22, L30	Secrest Short Cut Rd	55	EB Monroe Bypass	221	65	▲ 10	Isolated	
E18	Residential	B	L22, L30	Secrest Short Cut Rd	56	EB Monroe Bypass	455	64	8		
E19	Residential	B	L22, L30	Secrest Short Cut Rd	55	EB Monroe Bypass	430	65	▲ 10	Isolated	
D40	Residential	B	L22, L30	Southwind Trail	45	EB Monroe Bypass	384	* 70	▲ 25	Isolated	
D60	Residential	B	L22, L30	Unionville Indian Trail Rd	54	EB Monroe Bypass	450	62	8		
D61	Residential	B	L22, L30	Unionville Indian Trail Rd	53	EB Monroe Bypass	610	59	6		

[a] Ambient noise levels for study area receptors were estimated using measured noise levels conducted in similar settings with similar land uses.

Ambient noise levels were increased where necessary to a minimum value of 45 dBA, which is considered by NCDOT to be the lowest background level.

[b] Calculated by taking the difference between the ambient noise level and the rounded adjusted (predicted) noise level for conservatism.

[c] Distances to the nearest proposed roadway are measured from the alignment's center line.

[d] Noise level decreases unrelated to noise barriers may occur due to existing roadway realignments.

* Denotes a noise impact per 23 CFR Part 772 (66 dBA or greater for residential receptors, and 71 dBA or greater for commercial receptors). Future noise levels were rounded to the nearest whole decibel prior to evaluating per 66/71 dBA criterion, for conservatism.

** Barrier N5-1 not feasible due to traffic noise on Secrest Shortcut.

▲ Denotes a substantial noise increase as defined in NCDOT's 2004 Traffic Noise Abatement Policy:

Existing Leq(h)	Increase
50 or less dBA	15 or more dBA
51 dBA	14 or more dBA
52 dBA	13 or more dBA
53 dBA	12 or more dBA
54 dBA	11 or more dBA
55 or more dBA	10 or more dBA

APPENDIX E

TNM INPUT AND OUTPUT FILES

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Appendix E is on CD only