

**Noise Addendum VI
Executive Summary
Fulton County, PI Number 721850-
State Route (SR) 400 Collector/Distributor Lanes
November 2018**

Project Description: The project proposes operational improvements along SR 400, just north of the Interstate 285 (I-285)/SR 400 interchange. The project proposes to construct new northbound and southbound Collector-Distributor (CD) lanes parallel to the existing main-line lanes of SR 400, and reconstruction of the Abernathy Road interchange to accommodate the ramp connections to and from the proposed CD lanes.

Project Changes: The Georgia Department of Transportation (GDOT) issued notice to proceed to a Design-Build Contractor (NPC) for construction of the SR 400 Collector/Distributor Lanes project. Upon notice to proceed, NPC began finalizing the design of the project. As a result of proposed design changes to the project, proposed Noise Barriers 1a/1b, 3, 4, 5a/5b, 7, and 8 have been reanalyzed and redesigned to best meet or exceed the number of benefitted receptors documented in the SR 400 Collector/Distributor Lanes Noise Impact Assessment (Addendum III) approved on July 12, 2016. This addendum documents the changes to these barrier designs proposed as a result of changes to the project design.

Prepared By: Brandon Batt

QC/QA: Keith McCage, PE

Signature

Date

Signature

Date

Approved By: GDOT

Signature

Date

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**NOISE IMPACT ASSESSMENT ADDENDUM VI
FULTON COUNTY
STATE ROUTE (SR) 400 COLLECTOR / DISTRIBUTOR LANES
PI No. 721850-
NOVEMBER 2018**

1. INTRODUCTION

In compliance with 23 USC Section 109(h) and (i), the Federal Highway Administration (FHWA) established a standard for the assessment of highway traffic-generated noise. The standard, published as Part 772 of Title 23 of the Code of Federal Regulations (23 C.F.R. § 772), provide procedures to be followed in conducting noise analyses that will protect the public health, welfare and livability. In accordance with the Noise Control Act of 1972, coordination of this regulation with the Environmental Protection Agency (EPA) has been completed. The following assessment has been prepared in accordance with 23 C.F.R. § 772.

This report focuses on the human environment and documents the results of a noise analysis completed for the proposed project, in order to:

- a. Provide baseline noise levels that will be used in determining project impact.
- b. Predict the effects that the proposed project would have on the noise environment.
- c. Identify impacted locations where noise abatement is feasible and reasonable and likely to be included in the project, and locations where impacts will occur and abatement is not feasible and reasonable.

Noise Impact Assessment Addendum VI (Addendum VI) is being prepared as a result of validation efforts to assess the effectiveness of modifications prepared by North Perimeter Contractors (NPC), based on the current design plan. Addendum VI documents changes to Noise Barriers 1a/1b, 3, 4, 5a/5b, 7, and 8 as well as updates to the Build and Barrier Traffic Noise Model (TNM) approved on July 12, 2017 (Addendum III). Addendum V was prepared to address modifications to Noise Barrier 6 and was approved in June 2018. Addendum IV was a no-change memorandum. Addendum III was prepared to update noise barrier designs and the TNM to the latest costing plans. Noise Addendum II was approved in December 2014.

1.1 What is The Proposed Project?

The project proposes operational improvements along SR 400, just north of the Interstate 285 (I-285)/SR 400 interchange. The project proposes to construct new northbound and southbound Collector-Distributor (CD) lanes parallel to the existing main-line lanes of SR 400, and reconstruction of the Abernathy Road interchange to accommodate the ramp connections to and from the proposed CD lanes. As a part of this project, new bridges would be constructed to carry the CD lanes over Abernathy Road and to provide separated ramp movements in the area between Abernathy Road and Hammond Road to eliminate conflicts due to merging and weaving. The existing SR 400 at Mount Vernon Road bridge would be replaced to accommodate the additional CD lanes underneath. The existing SR 400 at Spalding Drive bridge would be modified to accommodate construction of the CD lanes underneath the outer spans of the bridge.

2. TRAFFIC NOISE MODEL UPDATES

TNM updates were completed for segments along the project corridor adjacent to Noise Barriers 1a/1b, 4, and 5a/5b. This update included updating TNM with more detailed information related to roadway inputs

and elevation/terrain data that was used in the analysis. Summaries for these modifications are provided below.

2.1 Noise Barrier 1a/1b

The build TNM documented in the Addendum III Noise Impact Assessment (NIA) was updated for the proposed Noise Barrier 1a/1b system. The update was completed for a section of Noise Barrier 1b located on proposed ramp NB R2 that abuts Bridge 31. Segments of Noise Barrier 1b just north of the bridge were modeled as “on-structure” segments in this Addendum, thus allowing sound to pass underneath Noise Barrier 1b at this location. This update was completed for the Build condition. Due to the nature of this model update, length, height range, square footage, and cost estimate has not changed. Tables 1a through 1c (below) summarize these results.

Table 1a. Noise Barriers 1a/1b Receiver (Receptor) Summary

Report	Impacted Receivers (Receptors)	Benefitted Receivers (Receptors)
July 2016 NIA	7 (71)	43 (373)
Model Update (2018)	7 (71)	42 (369)

Table 1b. Noise Barriers 1a/1b Summary

Report	Noise Barrier	Length (ft)	Minimum Height (ft)	Maximum Height (ft)	Area (Sq. Ft)	Est. Construction Cost
July 2016 NIA	Noise Barrier 1a	2,472	28	28	69,212	\$1,384,246
	Noise Barrier 1b	1,613	12	16	22,772	\$455,450
Model Update 2018	Noise Barrier 1a	2,472	28	28	69,212	\$1,384,246
	Noise Barrier 1b	1,613	12	16	22,772	\$455,450

Table 1c. Noise Barriers 1a/1b Sound Level Comparison (dB(a))

Receiver	Receptors	NAC	Build Sound Level (July 2016 NIA)	Build Sound Level (2018 Update)	Change in Sound Level	With Barrier Sound Level (July 2016 NIA)	Decibel Reduction (July 2016 NIA)	Decibel Reduction (2018 Update)	Change in Decibel Reduction
10	1	E	59.5	59.5	0.0	54.9	4.6	4.6	0.0
11.1	3	B	61.1	61.1	0.0	54.1	7.0	6.9	-0.1
11.2	3	B	65.1	65.1	0.0	55.0	10.1	10.0	-0.1
12.1	8	B	59.6	59.6	0.0	53.2	6.4	6.4	0.0
12.2	8	B	62.9	62.9	0.0	54.2	8.7	8.6	-0.1
13.1	5	B	62.0	62.0	0.0	54.7	7.3	7.2	-0.1
13.2	5	B	66.2	66.2	0.0	55.5	10.7	10.6	-0.1

Table 1c. Noise Barriers 1a/1b Sound Level Comparison (dB(a))

Receiver	Receptors	NAC	Build Sound Level (July 2016 NIA)	Build Level Sound (2018 Update)	Change in Sound Level	With Barrier Sound Level (July 2016 NIA)	Decibel Reduction (July 2016 NIA)	Decibel Reduction (2018 Update)	Change in Decibel Reduction
14.1	4	B	63.5	63.5	0.0	55.7	7.8	7.8	0.0
14.2	4	B	68.3	68.3	0.0	56.2	12.1	12.0	-0.1
15.1	5	B	60.3	60.3	0.0	53.5	6.8	6.8	0.0
15.2	5	B	63.5	63.5	0.0	54.4	9.1	9.0	-0.1
16.1	4	B	66.2	66.2	0.0	56.7	9.5	9.4	-0.1
16.2	4	B	70.5	70.5	0.0	57.4	13.1	13.1	0.0
17.1	4	B	57.9	58.0	0.1	52.2	5.7	5.8	0.1
17.2	4	B	60.9	60.9	0.0	53.3	7.6	7.5	-0.1
18	1	C	55.4	55.4	0.0	50.5	4.9	4.8	-0.1
19	131	C	60.1	60.2	0.1	53.6	6.5	6.5	0.0
28	5	B	59.3	59.3	0.0	52.5	6.8	6.6	-0.2
29	4	B	63.2	63.2	0.0	54.7	8.5	8.3	-0.2
30	4	B	57.2	57.2	0.0	51.3	5.9	5.9	0.0
31	7	B	63.8	63.8	0.0	54.0	9.8	9.6	-0.2
32	4	B	60.3	60.4	0.1	54.1	6.2	6.1	-0.1
33	8	B	65.0	65.1	0.1	54.7	10.3	9.8	-0.5
34	4	B	60.6	60.7	0.1	53.0	7.6	7.1	-0.5
35	6	B	57.8	57.8	0.0	51.3	6.5	6.3	-0.2
36	7	B	56.3	56.4	0.1	51.0	5.3	5.2	-0.1
37	4	B	66.9	67.0	0.1	55.9	11.0	9.8	-1.2
38	2	B	66.2	66.9	0.7	57.3	8.9	6.0	-2.9
39	6	B	59.0	59.4	0.4	52.9	6.1	5.4	-0.7
40	4	B	57.8	58.1	0.3	52.1	5.7	5.4	-0.3
41	6	B	56.3	56.5	0.2	51.0	5.3	5.1	-0.2
42	2	B	62.1	62.3	0.2	55.1	7.0	6.5	-0.5
43	4	B	58.2	58.4	0.2	52.6	5.6	5.5	-0.1
44	8	B	54.5	54.6	0.1	49.8	4.7	4.5	-0.2
45	2	B	59.5	59.5	0.0	51.9	7.6	7.5	-0.1
46	2	B	56.8	57.0	0.2	51.1	5.7	5.4	-0.3
47	4	B	55.0	55.1	0.1	50.0	5.0	4.8	-0.2
56	7	B	57.3	57.4	0.1	52.5	4.8	4.7	-0.1
58	7	B	59.6	59.7	0.1	54.1	5.5	5.4	-0.1
59	8	B	63.5	63.7	0.2	57.1	6.4	6.2	-0.2
60	10	B	59.7	59.8	0.1	54.1	5.6	5.5	-0.1
61	1	B	64.5	64.5	0.0	58.4	6.1	6.1	0.0
62	1	B	64.4	64.5	0.1	58.5	5.9	5.8	-0.1

Table 1c. Noise Barriers 1a/1b Sound Level Comparison (dB(a))

Receiver	Receptors	NAC	Build Sound Level (July 2016 NIA)	Build Level Sound (2018 Update)	Change in Sound Level	With Barrier Sound Level (July 2016 NIA)	Decibel Reduction (July 2016 NIA)	Decibel Reduction (2018 Update)	Change in Decibel Reduction
63	14	B	64.0	64.0	0.0	58.1	5.9	5.8	-0.1
70	1	E	67.5	67.5	0.0	59.8	7.7	7.7	0.0
71	1	E	68.5	68.5	0.0	62.7	5.8	5.8	0.0
72	48	C	71.1	71.1	0.0	63.7	7.4	7.4	0.0

Impacted highlighted

2.2 Noise Barrier 4

The build TNM documented in Addendum III was updated for proposed Noise Barrier 4. The barrier was revised to move a section that encroached upon the adjacent roadway shoulder. This update was completed for the Build condition. Tables 2a through 2c (below) summarize these results.

Table 2a. Noise Barrier 4 Receiver (Receptor) Summary

Report	Impacted Receivers (Receptors)	Benefitted Receivers (Receptors)
July 2016 NIA	21 (192)	18 (152)
Model Update 2018	21 (192)	20 (156)

Table 2b. Noise Barrier 4 Summary

Report	Noise Barrier	Length (ft)	Minimum Height (ft)	Maximum Height (ft)	Area (Sq. Ft)	Est. Construction Cost
July 2016 NIA	Noise Barrier 4	1,809	10	30	54,009	\$1,080,172
Model Update 2018	Noise Barrier 4	1,958	10	30	56,123	\$1,403,068

Table 2c. Noise Barrier 4 Sound Level Comparison (dB(a))

Receiver	Receptors	NAC	Build Sound Level (July 2016 NIA)	Build Level Sound (2018 Update)	Change in Sound Level	With Barrier Sound Level (July 2016 NIA)	Decibel Reduction (July 2016 NIA)	Decibel Reduction (2018 Update)	Change in Decibel Reduction
142	1	E	60.4	60.3	-0.1	60.0	0.4	0.8	0.4
143	1	E	61.1	61.1	0.0	60.5	0.6	0.6	0.0
145.1	4	B	64.0	63.9	-0.1	59.3	4.7	5.3	0.6
145.2	8	B	69.0	68.9	-0.1	61.3	7.7	8.7	1.0
145.3	4	B	72.7	72.6	-0.1	63.0	9.7	10.3	0.6

Table 2c. Noise Barrier 4 Sound Level Comparison (dB(a))

Receiver	Receptors	NAC	Build Sound Level (July 2016 NIA)	Build Level Sound (2018 Update)	Change in Sound Level	With Barrier Sound Level (July 2016 NIA)	Decibel Reduction (July 2016 NIA)	Decibel Reduction (2018 Update)	Change in Decibel Reduction
146.1	4	B	61.4	61.4	0.0	57.6	3.8	3.9	0.1
146.2	8	B	63.9	63.8	-0.1	60.0	3.9	4.5	0.6
146.3	4	B	66.7	66.7	0.0	61.5	5.2	6.0	0.8
147.1	5	B	62.3	62.2	-0.1	58.2	4.1	5.2	1.1
147.2	5	B	64.4	64.4	0.0	60.4	4.0	5.2	1.2
148	44	C	61.5	61.5	0.0	58.0	3.5	4.5	1.0
149.1	8	B	61.4	61.5	0.1	57.8	3.6	4.3	0.7
149.2	8	B	63.4	63.4	0.0	59.5	3.9	4.5	0.6
150.1	8	B	59.3	59.3	0.0	56.6	2.7	3.2	0.5
150.2	8	B	61.2	61.1	-0.1	58.2	3.0	3.6	0.6
151.1	8	B	59.7	59.7	0.0	57.1	2.6	2.5	-0.1
151.2	8	B	61.4	61.3	-0.1	58.7	2.7	2.6	-0.1
152	7	B	63.0	63.1	0.1	59.1	3.9	3.8	-0.1
153	4	B	58.5	58.6	0.1	55.8	2.7	3.0	0.3
154	4	B	59.1	59.1	0.0	56.4	2.7	3.1	0.4
155	4	B	59.1	59.0	-0.1	56.6	2.5	2.7	0.2
156	4	B	58.7	58.6	-0.1	56.4	2.3	2.6	0.3
158.1	5	B	69.4	69.4	0.0	59.9	9.5	9.2	-0.3
158.2	10	B	71.4	71.3	-0.1	61.2	10.2	9.8	-0.4
158.3	10	B	72.6	72.6	0.0	62.3	10.3	9.8	-0.5
158.4	10	B	73.4	73.4	0.0	63.3	10.1	8.7	-1.4
159.1	4	B	70.0	70.1	0.1	61.6	8.4	8.4	0.0
159.2	6	B	71.6	71.6	0.0	62.8	8.8	8.6	-0.2
159.3	8	B	72.7	72.7	0.0	63.8	8.9	8.5	-0.4
159.4	8	B	73.3	73.3	0.0	64.6	8.7	7.6	-1.1
160.2	10	B	63.4	63.4	0.0	59.5	3.9	4.0	0.1
160.3	10	B	66.0	66.1	0.1	61.0	5.0	5.1	0.1
160.4	10	B	67.4	67.4	0.0	61.9	5.5	5.5	0.0
161.1	10	B	61.9	61.9	0.0	58.8	3.1	3.2	0.1
161.2	16	B	64.0	64.0	0.0	61.1	2.9	3.1	0.2
161.3	20	B	66.1	66.1	0.0	62.3	3.8	3.8	0.0
161.4	20	B	68.7	68.7	0.0	62.9	5.8	5.7	-0.1
162.1	5	B	68.5	68.6	0.1	63.4	5.1	5.2	0.1
162.2	10	B	70.0	70.1	0.1	65.0	5.0	5.0	0.0
162.3	10	B	71.0	71.0	0.0	65.8	5.2	5.1	-0.1
162.4	10	B	71.8	71.8	0.0	66.7	5.1	4.9	-0.2

Table 2c. Noise Barrier 4 Sound Level Comparison (dB(a))

Receiver	Receptors	NAC	Build Sound Level (July 2016 NIA)	Build Level Sound (2018 Update)	Change in Sound Level	With Barrier Sound Level (July 2016 NIA)	Decibel Reduction (July 2016 NIA)	Decibel Reduction (2018 Update)	Change in Decibel Reduction
163.1	5	B	61.9	61.8	-0.1	60.4	1.5	1.4	-0.1
163.2	8	B	65.2	65.2	0.0	62.5	2.7	2.7	0.0
163.3	10	B	66.4	66.5	0.1	63.6	2.8	2.9	0.1
163.4	10	B	67.3	67.3	0.0	64.2	3.1	3.1	0.0
164.1	5	B	61.4	61.4	0.0	59.8	1.6	1.6	0.0
164.2	10	B	63.6	63.6	0.0	61.7	1.9	1.9	0.0
164.3	10	B	64.8	64.8	0.0	62.8	2.0	1.9	-0.1
164.4	10	B	65.5	65.5	0.0	63.5	2.0	2.0	0.0

Impacted highlighted

2.3 Noise Barriers 5a/5b

The build TNM documented in Addendum III was updated for the proposed Noise Barrier 5a/5b system. The update was completed for a section of Noise Barriers 5a and 5b where the noise barrier segments encroached upon the northbound on-ramp at the North Springs transit station. The northbound on-ramp in the TNM was also extended approximately 1,500 feet north, based on the original costing plans. Tables 3a through 3c (below) summarize these results.

Table 3a. Noise Barriers 5a/5b Receiver (Receptor) Summary

Report	Impacted Receivers (Receptors)	Benefitted Receivers (Receptors)
July 2016 NIA	61 (589)	92 (944)
Model Update 2018	67 (620)	94 (953)

Table 3b. Noise Barriers 5a/5b Summary

Report	Noise Barrier	Length (ft)	Minimum Height (ft)	Maximum Height (ft)	Area (Sq. Ft)	Est. Construction Cost
July 2016 NIA	Noise Barrier 5a	1,131	26	26	29,408	\$588,168
	Noise Barrier 5b	4,084	20	30	113,335	\$2,266,698
Model Update 2018	Noise Barrier 5a	997	26	26	25,934	\$518,675
	Noise Barrier 5b	4,012	20	30	111,195	\$2,223,908

Table 3c. Noise Barriers 5a/5b Sound Level Comparison (dB(a))

Receiver	Receptors	NAC	Build Sound Level (July 2016 NIA)	Build Level Sound (2018 Update)	Change in Sound Level	With Barrier Sound Level (July 2016 NIA)	Decibel Reduction (July 2016 NIA)	Decibel Reduction (2018 Update)	Change in Decibel Reduction
171.1	4	B	69.8	70.3	0.5	59.1	10.7	7.7	-3.0
171.2	8	B	71.8	71.9	0.1	60.9	10.9	7.8	-3.1
171.3	8	B	72.9	72.9	0.0	62.3	10.6	7.6	-3.0
171.4	8	B	73.5	73.5	0.0	64.1	9.4	7.0	-2.4
172.1	4	B	71.0	71.2	0.2	59.0	12.0	10.1	-1.9
172.2	8	B	72.4	72.5	0.1	61.0	11.4	10.0	-1.4
172.3	8	B	73.5	73.5	0.0	62.8	10.7	9.3	-1.4
172.4	8	B	74.0	73.9	-0.1	65.8	8.2	6.8	-1.4
173.1	4	B	70.9	71.2	0.3	58.1	12.8	12.7	-0.1
173.2	8	B	72.7	72.5	-0.2	59.3	13.4	12.8	-0.6
173.3	8	B	73.8	73.6	-0.2	60.6	13.2	12.7	-0.5
173.4	8	B	74.3	74.1	-0.2	62.9	11.4	10.7	-0.7
174.2	8	B	72.7	72.6	-0.1	59.1	13.6	13.1	-0.5
174.3	8	B	73.9	73.7	-0.2	60.3	13.6	13.0	-0.6
175.1	4	B	70.2	71.4	1.2	57.6	12.6	13.6	1.0
175.2	8	B	73.5	73.4	-0.1	58.1	15.4	15.1	-0.3
175.3	8	B	74.7	74.3	-0.4	59.0	15.7	15.0	-0.7
175.4	8	B	75.0	74.7	-0.3	60.9	14.1	13.5	-0.6
176.1	4	B	65.4	65.9	0.5	55.6	9.8	10.0	0.2
176.2	8	B	67.1	67.4	0.3	57.3	9.8	9.9	0.1
176.3	8	B	68.5	68.4	-0.1	58.6	9.9	9.7	-0.2
176.4	8	B	69.6	69.4	-0.2	59.7	9.9	9.6	-0.3
177.1	8	B	66.8	67.0	0.2	58.7	8.1	7.8	-0.3
177.2	8	B	67.9	67.9	0.0	60.4	7.5	7.2	-0.3
178.1	8	B	66.1	66.4	0.3	57.7	8.4	6.6	-1.8
178.2	16	B	67.6	67.8	0.2	59.7	7.9	6.2	-1.7
178.3	16	B	68.6	68.7	0.1	61.1	7.5	5.9	-1.6
178.4	16	B	69.5	69.5	0.0	62.5	7.0	5.5	-1.5
179	95	C	63.6	63.9	0.3	57.6	6.0	6.3	0.3
180.2	14	B	65.7	65.9	0.2	61.0	4.7	4.3	-0.4
180.3	14	B	66.7	66.8	0.1	61.9	4.8	4.3	-0.5
181	1	E	64.0	64.2	0.2	59.0	5.0	5.1	0.1
182.1	4	B	63.1	63.5	0.4	56.8	6.3	6.8	0.5
182.2	12	B	65.2	65.3	0.1	58.6	6.6	6.8	0.2
182.3	12	B	66.7	66.7	0.0	61.4	5.3	5.3	0.0
182.4	8	B	67.3	67.3	0.0	62.0	5.3	5.4	0.1

Table 3c. Noise Barriers 5a/5b Sound Level Comparison (dB(a))

Receiver	Receptors	NAC	Build Sound Level (July 2016 NIA)	Build Level Sound (2018 Update)	Change in Sound Level	With Barrier Sound Level (July 2016 NIA)	Decibel Reduction (July 2016 NIA)	Decibel Reduction (2018 Update)	Change in Decibel Reduction
183.1	8	B	64.4	65.1	0.7	55.3	9.1	9.7	0.6
183.2	16	B	67.8	68.0	0.2	56.4	11.4	11.6	0.2
183.3	16	B	68.8	68.8	0.0	57.3	11.5	11.5	0.0
183.4	16	B	69.7	69.5	-0.2	58.4	11.3	11.1	-0.2
184.1	8	B	64.0	64.6	0.6	55.5	8.5	9.1	0.6
184.2	16	B	68.5	68.8	0.3	56.5	12.0	12.3	0.3
184.3	16	B	69.7	69.7	0.0	57.2	12.5	12.5	0.0
184.4	16	B	70.6	70.4	-0.2	57.9	12.7	12.5	-0.2
185.1	4	B	61.9	62.5	0.6	54.7	7.2	7.9	0.7
185.2	8	B	66.2	66.5	0.3	56.0	10.2	10.5	0.3
185.3	8	B	67.5	67.7	0.2	56.9	10.6	10.9	0.3
185.4	8	B	68.4	68.3	-0.1	57.8	10.6	10.6	0.0
186.1	8	B	61.0	61.5	0.5	55.9	5.1	5.7	0.6
186.2	16	B	64.0	64.3	0.3	58.1	5.9	6.3	0.4
186.3	16	B	65.3	65.5	0.2	60.0	5.3	5.6	0.3
186.4	16	B	66.2	66.3	0.1	60.8	5.4	5.6	0.2
187	71	C	63.5	63.8	0.3	56.3	7.2	7.6	0.4
208.1	4	B	68.1	68.9	0.8	57.8	10.3	11.0	0.7
208.2	10	B	74.8	75.2	0.4	58.3	16.5	16.9	0.4
208.3	10	B	75.6	76.0	0.4	59.6	16.0	16.3	0.3
208.4	10	B	75.9	76.2	0.3	62.1	13.8	14.0	0.2
209	1	C	60.3	60.7	0.4	58.2	2.1	2.6	0.5
210.1	4	B	72.1	73.2	1.1	58.5	13.6	14.5	0.9
210.2	10	B	75.2	75.8	0.6	59.5	15.7	16.3	0.6
210.3	10	B	75.8	76.3	0.5	61.0	14.8	15.3	0.5
211.1	10	B	65.0	65.4	0.4	55.3	9.7	10.1	0.4
211.2	10	B	67.3	67.7	0.4	56.9	10.4	11.0	0.6
211.3	10	B	68.5	68.8	0.3	58.0	10.5	11.0	0.5
212.1	5	B	64.6	65.2	0.6	55.2	9.4	10.1	0.7
212.2	5	B	67.5	67.8	0.3	56.5	11.0	11.3	0.3
212.3	5	B	68.6	68.9	0.3	57.4	11.2	11.6	0.4
213.1	5	B	62.4	63.1	0.7	54.8	7.6	8.3	0.7
213.2	5	B	66.9	67.3	0.4	56.1	10.8	11.2	0.4
213.3	5	B	68.7	68.9	0.2	56.9	11.8	12.1	0.3
214.1	10	B	60.5	61.2	0.7	54.3	6.2	7.1	0.9
214.2	10	B	64.3	64.7	0.4	56.1	8.2	8.8	0.6

Table 3c. Noise Barriers 5a/5b Sound Level Comparison (dB(a))

Receiver	Receptors	NAC	Build Sound Level (July 2016 NIA)	Build Level Sound (2018 Update)	Change in Sound Level	With Barrier Sound Level (July 2016 NIA)	Decibel Reduction (July 2016 NIA)	Decibel Reduction (2018 Update)	Change in Decibel Reduction
214.3	10	B	65.9	66.2	0.3	57.3	8.6	9.2	0.6
214.4	10	B	66.7	67.0	0.3	58.3	8.4	8.9	0.5
215	4	B	65.1	66.0	0.9	57.4	7.7	8.4	0.7
216	4	B	66.3	66.7	0.4	56.1	10.2	10.6	0.4
217	4	B	62.1	62.6	0.5	55.0	7.1	7.6	0.5
218	8	B	62.8	63.3	0.5	55.2	7.6	8.5	0.9
219	8	B	61.3	61.7	0.4	56.9	4.4	5.6	1.2
220	4	B	62.7	63.2	0.5	55.1	7.6	8.4	0.8
221	4	B	64.9	66.4	1.5	57.9	7.0	8.2	1.2
222	4	B	75.2	76.9	1.7	59.2	16.0	17.1	1.1
223	5	B	63.9	64.6	0.7	55.4	8.5	9.0	0.5
224	9	B	64.9	65.4	0.5	55.7	9.2	9.7	0.5
225	8	B	62.9	63.4	0.5	56.5	6.4	7.1	0.7
226	6	B	62.5	63.0	0.5	56.6	5.9	6.8	0.9
227	5	B	59.9	60.1	0.2	57.2	2.7	3.8	1.1
228	11	B	61.7	62.0	0.3	59.2	2.5	3.2	0.7
229	5	B	64.9	67.4	2.5	57.8	7.1	9.1	2.0
230	5	B	75.5	76.1	0.6	61.3	14.2	14.0	-0.2
231	3	B	75.6	76.0	0.4	63.2	12.4	12.7	0.3
232	5	B	69.1	69.6	0.5	57.6	11.5	11.8	0.3
233	4	B	59.0	59.1	0.1	58.0	1.0	1.2	0.2
234	4	B	63.7	64.2	0.5	57.6	6.1	6.4	0.3
235	3	B	65.7	66.2	0.5	57.4	8.3	8.8	0.5
236	1	B	60.4	60.5	0.1	59.0	1.4	2.3	0.9
237.1	1	E	62.1	64.6	2.5	58.9	3.2	6.1	2.9
237.2	33	B	66.3	67.2	0.9	60.7	5.6	6.9	1.3
237.3	33	B	69.4	69.7	0.3	61.8	7.6	8.4	0.8
238	3	B	62.9	63.2	0.3	55.8	7.1	7.4	0.3
239	5	B	65.9	66.0	0.1	62.8	3.1	3.2	0.1
240	8	B	65.6	65.6	0.0	64.8	0.8	0.8	0.0
241	5	B	62.3	62.5	0.2	56.2	6.1	6.2	0.1

Impacted
highlighted

3. NOISE BARRIER REEVALUATIONS

This Addendum discusses the reevaluation for Noise Barriers 1a/1b, 3, 4, 5a/5b, 7, and 8. Noise Barrier 6 was evaluated under Addendum V which was been submitted and approved. The final locations of noise barriers were provided by NPC upon completion of the full roadway design. Noise Barriers 3, 7, and 8 were reevaluated to determine the horizontal alignments and panel heights based on the criteria of maintaining benefits for impacted receptors and, where possible, maintaining a benefitted reduction to non-impacted receivers identified in Addendum III. Noise Barriers 1a/1b, 4, and 5a/5b, were reevaluated based on the criteria of maintaining benefits for impacted receptors and, where possible, maintaining a benefitted reduction to non-impacted receivers identified and summarized in Section 2 of this document (2018 Update).

3.1 Noise Barriers 1a/1b Reevaluation

The final locations of Noise Barriers 1a/1b were provided by NPC upon completion of the full roadway design. The designs for Noise Barriers 1a/1b in the TNM have been revised based on this final location. The results of the revised Noise Barriers 1a/1b are shown in Appendix A. Receiver and barrier locations are shown in Appendix D.

Noise Barriers 1a/1b would begin near Hammond Drive and end just south of Mt. Vernon Road on the east side of SR 400. The heights of the barriers would vary between 12 and 30 feet.

The design of Noise Barriers 1a/1b was revised based on information provided by NPC. The design information provided by NPC included barrier height installation restrictions based on the proposed final barrier location. These height restrictions included maximum allowable noise barrier height on bridges.

As a result of increased panel heights (Noise Barrier 1a), two additional receivers representing eleven (11) receptors, Receivers 47 and 56, were found to be benefitted. As a result of modifications to Noise Barrier 1b, one receiver representing 1 receptor, Receiver 71, is no longer benefitted. Receiver 71 was found to not be impacted in the Build condition. The redesign of Noise Barriers 1a/1b would result in a net gain of 10 benefitted receptors.

To achieve the same sound level reduction for receivers located behind Noise Barriers 1a/1b in Addendum III, the design was modified by increasing the height of barrier panels across the entire length of the barrier system. Even at the maximum allowable height of 30 feet, similar or better abatement could not be achieved at one impacted receiver (Receiver 16.1) representing four (4) receptors. The predicted reduction at this receiver would be 9.2 dB(a), whereas 9.4 dB(a) was achieved in the updated model (see Section 2). The inability to provide a greater or equal sound level reduction for these receivers is likely caused by changes in the noise barrier location and refinements to the roadway design.

Table 4a. Noise Barriers 1a/1b Receiver (Receptor) Summary

Report	Impacted Receivers (Receptors)	Benefitted Receivers (Receptors)
Model Update 2018	7 (71)	42 (369)
NPC Design 2018	5 (65)	43 (379)

Table 4b. Noise Barriers 1a/1b Design Summary

Report	Noise Barrier	Length (ft)	Minimum Height (ft)	Maximum Height (ft)	Area (Sq. Ft)	Est. Construction Cost
Model Update (2018)	Noise Barrier 1a	2,472	28	28	69,212	\$1,384,246
	Noise Barrier 1b	1,613	12	16	22,772	\$455,450
NPC Design (2018)	Noise Barrier 1a	2,494	30	30	74,821	\$1,496,424
	Noise Barrier 1b	1,613	12	22	23,736	\$474,702

3.2 Noise Barrier 3 Reevaluation

The final location of Noise Barrier 3 was provided by NPC upon completion of the full roadway design. The design for Noise Barrier 3 has been revised based on this final location. The results of the revised Noise Barrier 3 are shown in Appendix A. Receiver and barrier locations are shown in Appendix D.

Noise Barrier 3 would begin near Mt. Vernon Road and end approximately 380 feet north of Abernathy Road on the west side of SR 400. The height of the barrier would vary between 12 and 30 feet.

The design of Noise Barrier 3 was revised based on information provided by NPC. The design information provided by NPC included barrier height installation restrictions based on the proposed final barrier location. These height restrictions included maximum allowable noise barrier height on bridges, concrete side barrier, and concrete retaining walls.

Noise Barrier 3 was shortened by approximately 150 feet to avoid conflicts with adjacent retaining walls. To achieve the same sound level reduction at impacted receivers identified in Addendum III, sections of Noise Barrier 3 were raised to maximum heights not exceeding maximum allowable heights in these locations due to restrictions mentioned above (30 feet, 18 feet, and 12 feet). As a result of increased panel heights, two (2) receivers (representing 24 receptors) previously identified as impacted and benefitted in Addendum III would continue to be benefitted. Of the remaining five (5) impacted receivers (representing 51 receptors), three (3) receivers (representing 15 receptors) would continue to receive the same or greater abatement. Two (2) receivers (representing 36 receptors) which were previously identified as impacted, but not benefitted, would receive a 1.1 dB(a) reduction due to the revised Noise Barrier 3 design. The inability to provide a greater or equal sound level reduction for these receivers is likely caused by changes in the noise barrier location.

Table 5a. Noise Barrier 3 Receiver (Receptor) Summary

Report	Impacted Receivers (Receptors)	Benefitted Receivers (Receptors)
Costing Plans	7 (75)	2 (24)
NPC Design 2018	7 (75)	2 (24)

Table 5b. Noise Barrier 3 Design Summary

Report	Noise Barrier	Length (ft)	Minimum Height (ft)	Maximum Height (ft)	Area (Sq. Ft)	Est. Construction Cost
Costing Plans	Noise Barrier 3	1,788	12	26	30,652	613,034
NPC Design (2018)	Noise Barrier 3	1,638	12	30	27,235	\$544,704

3.3 Noise Barrier 4 Reevaluation

The final location of Noise Barrier 4 was provided by NPC upon completion of the full roadway design. The design for Noise Barrier 4 has been revised based on this final location. The results of the revised Noise Barrier 4 are shown in Appendix A. Receiver and barrier locations are shown in Appendix D.

Noise Barrier 4 would begin near Embassy Row and end at the North Springs transit station on-ramp on the east side of SR 400, a length of approximately 1,995 feet. The height of the barrier would vary between 20 and 30 feet.

The design of Noise Barrier 4 was revised based on information provided by NPC. To achieve the same sound level reduction for impacted receivers as was achieved in the Costing Plan design (2018 Update), the new design was modified by increasing the height of barrier panels at the southern end of the noise barrier. These panels were raised to a height of 28 feet. As a result of modifications to Noise Barrier 4, all receivers identified as impacted in the Costing Plan design (2018 Update) are predicted to meet or exceed the abatement predicted in the Costing Plan design (2018 Update). Furthermore, due to refinements in the horizontal alignment, two (2) receivers (representing 20 receptors) are no longer predicted to be impacted under the final design. Results are summarized below.

Table 6a. Noise Barrier 4 Receiver (Receptor) Summary

Report	Impacted Receivers (Receptors)	Benefitted Receivers (Receptors)
Model Update 2018	21 (192)	20 (156)
NPC Design 2018	19 (172)	21 (166)

Table 6b. Noise Barrier 4 Design Summary

Report	Noise Barrier	Length (ft)	Minimum Height (ft)	Maximum Height (ft)	Area (Sq. Ft)	Est. Construction Cost
Model Update (2018)	Noise Barrier 4	1,958	10	30	56,123	\$1,403,068
NPC Design (2018)	Noise Barrier 4	2,002	20	30	55,202	\$1,104,048

3.4 Noise Barriers 5a/5b Reevaluation

The final locations of Noise Barriers 5a and 5b were provided by NPC upon completion of the full roadway design. The designs for Noise Barriers 5a and 5b have been revised based on this final location. The results of the revised Noise Barriers 5a and 5b are shown in Appendix A. Receiver and barrier locations are shown in Appendix D.

Noise Barrier 5a would begin north of the North Springs transit station southbound off-ramp, where the flyover ramp crosses SR 400, and end at the North Springs transit station northbound on-ramp on the east side of SR 400, a length of approximately 1,024 feet. Noise Barrier 5b would begin just north of the North Springs transit station northbound on-ramp and end just south of Spalding Drive, a length of approximately 3,973 feet. The height of Noise Barrier 5a would vary between 26 and 30 feet. The height of Noise Barrier 5b would vary between 24 and 28 feet.

The design of Noise Barriers 5a and 5b were revised based on information provided by NPC. NPC provided an optimized barrier design that was subsequently validated. NPC-provided adjustments included panel heights for Noise Barrier 5a that were increased to the maximum allowable height of 30 feet for approximately 700 feet approaching the northern terminus of the noise barrier. DB-Contractor-provided adjustments for Noise Barrier 5b included adjustments due to refinements in the horizontal alignment; an approximately 800-foot section shifted east approximately 10-60 feet, and vertical adjustments in this area ranged from 4 to 6 feet. The revised design would continue to provide at least a 5 dB(a) reduction to all receivers identified as benefitted in Addendum III (2018 Update). The revised design would also continue to achieve at least a 7 dB(a) reduction for all impacted receivers identified in Addendum III (2018 Update) where the design goal was previously met. Due to adjustments in the horizontal alignment, nine (9) receivers (representing 91 receptors) are no longer predicted to be impacted under the revised design. Results are summarized below.

Table 7a. Noise Barriers 5a/5b Receiver (Receptor) Summary

Report	Impacted Receivers (Receptors)	Benefitted Receivers (Receptors)
Model Update 2018	67 (620)	94 (953)
NPC Design 2018	58 (529)	96 (985)

Table 7b. Noise Barriers 5a/5b Design Summary

Report	Noise Barrier	Length (ft)	Minimum Height (ft)	Maximum Height (ft)	Area (Sq. Ft)	Est. Construction Cost
Model Update (2018)	Noise Barrier 5a	997	26	26	25,934	\$518,675
	Noise Barrier 5b	4,012	20	30	111,195	\$2,223,908
NPC Design (2018)	Noise Barrier 5a	1,024	26	30	29,408	\$588,165
	Noise Barrier 5b	3,973	24	28	105,982	\$2,119,648

3.5 Noise Barrier 7 Reevaluation

The final location of Noise Barrier 7 was provided by NPC upon completion of the full roadway design. The design for Noise Barrier 7 has been revised based on this final location. The results of the revised Noise Barrier 7 are shown in Appendix A. Receiver and barrier locations are shown in Appendix D.

Noise Barrier 7 would begin north of Spalding Drive and end approximately 450 feet south of Pitts Road on the east side of SR 400, a length of approximately 4,735 feet. The height of the barrier would vary between 6 and 30 feet.

The design of Noise Barrier 7 was revised based on information provided by NPC. To achieve the same sound level reduction for impacted receivers as was achieved in Addendum III, the new design was modified by increasing the height of barrier panels along sections of the noise barrier. These sections were raised to no greater than the maximum allowable height of 30 feet. As a result of modifications to Noise Barrier 7, all receivers identified as impacted in the Costing Plan design are predicted to meet or exceed the abatement predicted in the Costing Plan design (2018 Update). Results are summarized below.

Table 8a. Noise Barrier 7 Receiver (Receptor) Summary

Report	Impacted Receivers (Receptors)	Benefitted Receivers (Receptors)
Costing Plans	33 (322)	48 (396)
NPC Design 2018	28 (292)	48 (396)

Table 8b. Noise Barrier 7 Design Summary

Report	Noise Barrier	Length (ft)	Minimum Height (ft)	Maximum Height (ft)	Area (Sq. Ft)	Est. Construction Cost
Costing Plans	Noise Barrier 7	4,804	12	30	117,081	\$2,341,620
NPC Design (2018)	Noise Barrier 7	4,735	6	30	105,550	\$2,111,005

3.6 Noise Barrier 8 Reevaluation

The final location of Noise Barrier 8 was provided by NPC upon completion of the full roadway design. The design for Noise Barrier 8 has been revised based on this final location. The results of the revised Noise Barrier 8 are shown in Appendix A. Receiver and barrier locations are shown in Appendix D.

Noise Barrier 8 would begin just north of Spalding Drive and end approximately 350 feet south of Pitts Road on the west side of SR 400, a length of approximately 1,995 feet. The height of the barrier would vary between 6 and 30 feet.

The design of Noise Barrier 8 was revised based on information provided by NPC. To achieve the same sound level reduction for impacted receivers as was achieved in Addendum III, the new design was modified by increasing the height of barrier panels along sections of the noise barrier. These sections were raised to no greater than the maximum allowable height of 30 feet. As a result of modifications to Noise Barrier 8, all receivers identified as impacted in the Costing Plan design are predicted to meet or

exceed the abatement predicted in the Costing Plan design (2018 Update). Refinements in the horizontal alignment have resulted in a predicted net loss of 7 impacted receptors. Additionally, the revised noise barrier design is predicted to result in a loss of 114 benefitted receptors. One non-impacted receiver, a community pool representing 110 receptors, represents the bulk of this number. (Results are summarized below.

Table 9a. Noise Barrier 8 Receiver (Receptor) Summary

Report	Impacted Receivers (Receptors)	Benefitted Receivers (Receptors)
Costing Plans	24 (151)	72 (599)
NPC Design 2018	24 (144)	71 (485)

Table 9b. Noise Barrier 8 Design Summary

Report	Noise Barrier	Length (ft)	Minimum Height (ft)	Maximum Height (ft)	Area (Sq. Ft)	Est. Construction Cost
Costing Plans	Noise Barrier 8	5,171	12	30	128,128	\$2,562,567
NPC Design (2018)	Noise Barrier 8	4,864	6	30	109,205	\$2,184,104

4. WHAT ARE THE CONCLUSIONS?

The final location of proposed noise barriers was provided by NPC after roadway design was completed. Proposed Noise Barriers 1a/1b, 3, 4, 5a/5b, 7, and 8 were reevaluated in this Addendum to determine the final location and heights of the proposed noise barriers. Noise Barrier 6 was evaluated as part of Addendum V and has been approved.

The TNM models for Noise Barriers 1b, 4, 5a, and 5b (Addendum III) were updated to accurately reflect the original costing plan design. The Noise Barrier 1b update included modifying a roadway and barrier segment as “on-structure”. The Noise Barrier 4 included shifting the noise barrier to the edge of shoulder where conflicts were noted. The Noise Barrier 5a and 5b update included shortening both barriers at points where they encroached upon the gore area of an on-ramp and adding a roadway segment to accurately reflect the noise environment as designed in the costing plans (Addendum III).

Noise Barriers 1a and 1b have been analyzed based on final design information provided by NPC. While the revised design is unable to achieve equal or greater abatement at all receivers behind the noise barrier system, all impacted receivers identified as benefitted in the 2018 Update would continue to be benefitted under the revised barrier design. All impacted receivers identified as meeting the noise reduction goal of 7 dB(a) would continue to receive a 7 dB(a) or greater reduction under the revised design.

Noise Barrier 3 has been analyzed based on final design information provided by NPC. While the revised design is unable to achieve equal or greater abatement at all receivers behind the noise barrier, all impacted receivers identified as benefitted in Addendum III would continue to be benefitted under the revised barrier design. All impacted receivers identified as meeting the noise reduction goal of 7 dB(a) would continue to receive a 7 dB(a) or greater reduction under the revised design.

Noise Barrier 4 has been analyzed based on final design information provided by NPC. While the revised design is unable to achieve equal or greater abatement at all receivers behind the noise barrier system, all impacted receivers identified as benefitted in the 2018 Update would continue to be benefitted under the revised barrier design. All impacted receivers identified as meeting the noise reduction goal of 7 dB(a) would continue to receive a 7 dB(a) or greater reduction under the revised design.

The design of Noise Barriers 5a and 5b were revised based on information provided by NPC. While the revised design is unable to achieve equal or greater abatement at all receivers behind the noise barrier, all impacted receivers identified as benefitted in Addendum III would continue to be benefitted under the revised barrier design. All impacted receivers identified as meeting the noise reduction goal of 7 dB(a) would continue to receive a 7 dB(a) or greater reduction under the revised design.

Noise Barrier 7 has been analyzed based on final design information provided by NPC. While the revised design is unable to achieve equal or greater abatement at all receivers behind the noise barrier, all impacted receivers identified as benefitted in Addendum III would continue to be benefitted under the revised barrier design. All impacted receivers identified as meeting the noise reduction goal of 7 dB(a) would continue to receive a 7 dB(a) or greater reduction under the revised design.

Noise Barrier 8 has been analyzed based on final design information provided by NPC. While the revised design is unable to achieve equal or greater abatement at all receivers behind the noise barrier, all impacted receivers identified as benefitted in Addendum III would continue to be benefitted under the revised barrier design. All impacted receivers identified as meeting the noise reduction goal of 7 dB(a) would continue to receive a 7 dB(a) or greater reduction under the revised design.