APPENDIX 13A

Barrier Mitigation Tables

Table 13A-1. Mitigation Analysis: Barrier 1

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		32 (MF)	65	62	3	61–62	2–4	61–62	2–4
2nd Row & Beyond		48 (MF)	59–63	57–60	1–3	57–60	1–3	57–60	2–3

# benefiting receivers (at least 5 dBA):	0	0	0

Maximum Reduction:	3	4	4

UDOT Feasibility Requirements	**15 foot**	**17 foot**	**19 foot**
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	No	No	No
Is Barrier Feasible?	**No**	**No**	**No**

UDOT Cost Effectiveness Requirements	**15 foot**	**17 foot**	**19 foot**
Length of Modeled Barrier	1,000		
Barrier Area (1,000 feet) x wall height, sq. ft.			
Barrier Cost ($20.00 x Area)			
Cost per benefitting receiver			
Is Barrier Cost Effective?			

	15 foot	**17 foot**	**19 foot**
Is Barrier Feasible and Cost Effective?	**No**	**No**	**No**

Table 13A-2. Mitigation Analysis: Barrier 2

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		49	61–64	56–59	4–7	56–59	4–7	55–58	4–7
2nd Row & Beyond		63	58–63	52–58	4–7	52 -57	4–7	51–57	5–8

	15 foot	17 foot	19 foot
# benefiting receivers (at least 5 dBA):	100	105	110

	15 foot	17 foot	19 foot
Maximum Reduction:	7	7	8

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	**Yes**	**Yes**	**Yes**

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	2,200		
Barrier Area (2,200 feet) x wall height, sq. ft.	33,000	37,400	41,800
Barrier Cost ($20.00 x Area)	$660,000	$748,000	$836,000
Cost per benefitting receiver	$6,600	$7,124	$7,600
Is Barrier Cost Effective?	**Yes**	**Yes**	**Yes**

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	**Yes**	**Yes**	**Yes**

Table 13A-3. Mitigation Analysis: Barrier 3

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		22	63–65	58–61	3–6	57–61	3–7	53–61	3–10
2nd Row & Beyond		44	59–63	54–59	3–7	53–59	3–7	53–59	3–7

	15 foot	17 foot	19 foot
# benefiting receivers (at least 5 dBA):	49	49	57

	15 foot	17 foot	19 foot
Maximum Reduction:	7	7	10

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	Yes
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	Yes	Yes	Yes

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	1,400		
Barrier Area (1,400 feet) x wall height, sq. ft.	21,000	23,800	26,600
Barrier Cost ($20.00 x Area)	$420,000	$476,000	$532,000
Cost per benefitting receiver	$8,571	$9,714	$9,333
Is Barrier Cost Effective?	Yes	Yes	Yes

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	Yes	Yes	Yes

Table 13A-4. Mitigation Analysis: Barrier 4

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	**Decrease**	**Level**	**Decrease**	**Level**	**Decrease**
1st Row		18	69–73	63–67	4–7	62–66	5–8	62–65	6–10
2nd Row & Beyond		30	60–65	58–65	2–5	57–64	2–6	57–63	2–7

	15 foot	17 foot	19 foot
# benefiting receivers (at least 5 dBA):	16	20	26

	15 foot	17 foot	19 foot
Maximum Reduction:	7	8	10

UDOT Feasibility Requirements	**15 foot**	**17 foot**	**19 foot**
1 rec > 10 dBA reduction from a barrier?	No	No	Yes
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	**Yes**	**Yes**	**Yes**

UDOT Cost Effectiveness Requirements	**15 foot**	**17 foot**	**19 foot**
Length of Modeled Barrier	2,000		
Barrier Area (2,000 feet) x wall height, sq. ft.	30,000	34,000	38,000
Barrier Cost ($20.00 x Area)	$600,000	$680,000	$760,000
Cost per benefitting receiver	$37,500	$34,000	$29,230
Is Barrier Cost Effective?	No	No	**Yes**

	15 foot	**17 foot**	**19 foot**
Is Barrier Feasible and Cost Effective?	**No**	**No**	**Yes**

Table 13A-5. Mitigation Analysis: Barrier 5

Location		# du	No Barrier	8 foot		10 foot		12 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		18	69–73	63–67	4–7	62–66	5–8	62–65	6–10
2nd Row & Beyond		30	60–65	58–65	2–5	57–64	2–6	57–63	2–7

# benefiting receivers (at least 5 dBA):	0	0	0

Maximum Reduction:	5	5	5

UDOT Feasibility Requirements	8 foot	10 foot	12 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	**Yes**	**Yes**	**Yes**

UDOT Cost Effectiveness Requirements	8 foot	10 foot	12 foot
Length of Modeled Barrier	715		
Barrier Area (715 feet) x wall height, sq. ft.	5,720	7,150	8,580
Barrier Cost ($20.00 x Area)	$85,800	$107,250	$128,700
Cost per benefitting receiver	N/A	N/A	N/A
Is Barrier Cost Effective?	**Yes**	**Yes**	**Yes**

	8 foot	10 foot	12 foot
Is Barrier Feasible and Cost Effective?	**Yes**	**Yes**	**Yes**

Table 13A-6. Mitigation Analysis: Barrier 6

Location		# du	No Barrier	15 foot		17 foot		12 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		18	69–73	63–67	4–7	62–66	5–8	62–65	6–10
2nd Row & Beyond		30	60–65	58–65	2–5	57–64	2–6	57–63	2–7

	15 foot	17 foot	12 foot
# benefiting receivers (at least 5 dBA):	17	22	27

	15 foot	17 foot	12 foot
Maximum Reduction:	8	8	10

UDOT Feasibility Requirements	**15 foot**	**17 foot**	**19 foot**
1 rec > 10 dBA reduction from a barrier?	No	No	Yes
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	**Yes**	**Yes**	**Yes**

UDOT Cost Effectiveness Requirements	**15 foot**	**17 foot**	**19 foot**
Length of Modeled Barrier	2,500		
Barrier Area (2,500 feet) x wall height, sq. ft.	37,500	42,500	47,500
Barrier Cost ($20.00 x Area)	$750,000	$850,000	$950,000
Cost per benefitting receiver	$44,118	$38,636	$35,185
Is Barrier Cost Effective?	No	No	No

	15 foot	**17 foot**	**19 foot**
Is Barrier Feasible and Cost Effective?	**No**	**No**	**No**

Table 13A-7. Mitigation Analysis: Barrier 7

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		23	57–61	53–57	3–6	53–57	3–7	52–56	4–7
2nd Row & Beyond		34	55–60	50–56	3–6	49–56	3–6	40–56	3–7

	15 foot	17 foot	19 foot
# benefiting receivers (at least 5 dBA):	35	41	44

	15 foot	17 foot	19 foot
Maximum Reduction:	6	7	7

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	**Yes**	**Yes**	**Yes**

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	2,000		
Barrier Area (2,000 feet) x wall height, sq. ft.	30,000	34,000	38,000
Barrier Cost ($20.00 x Area)	$600,000	$680,000	$760,000
Cost per benefitting receiver	$17,143	$16,585	$17,273
Is Barrier Cost Effective?	**Yes**	**Yes**	**Yes**

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	**Yes**	**Yes**	**Yes**

Table 13A-8. Mitigation Analysis: Barrier 8

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		39	57–61	53–59	1–6	53–59	1–7	52–59	1–7
2nd Row & Beyond		82	51–59	49–56	1–6	49–56	1–6	49–55	1–7

# benefiting receivers (at least 5 dBA):	45	51	61

Maximum Reduction:	6	7	7

UDOT **Feasibility** Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	No	No	Yes
Is Barrier Feasible?	No	No	**Yes**

UDOT **Cost Effectiveness** Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	4,500		
Barrier Area (4,500 feet) x wall height, sq. ft.			85,500
Barrier Cost ($20.00 x Area)	N/A	N/A	$1,710,000
Cost per benefitting receiver			$28,033
Is Barrier Cost Effective?			**Yes**

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	**No**	**No**	**Yes**

Table 13A-9. Mitigation Analysis: Barrier 9

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		10	61–62	56–58	4–5	56–57	5	56–57	5
2nd Row & Beyond		39	56–60	52–56	3–6	52–56	3–6	52–56	3–6

# benefiting receivers (at least 5 dBA):	21	32	32

Maximum Reduction:	6	6	6

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	No	Yes	Yes
Is Barrier Feasible?	No	Yes	Yes

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	2,500		
Barrier Area (2,500 feet) x wall height, sq. ft.		42,500	47,500
Barrier Cost ($20.00 x Area)	N/A	$850,000	$950,000
Cost per benefitting receiver		$26,563	$29,688
Is Barrier Cost Effective?		Yes	Yes

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	No	Yes	Yes

Table 13A-10. Mitigation Analysis: Barrier 10

NOTE: Barrier 10 not feasible – outside 500 feet and no 5-dBA reduction

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row									
2nd Row & Beyond									

# benefiting receivers (at least 5 dBA):			

Maximum Reduction:			

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?			
75% or more 1st row > 5 dBA reduction?			
Is Barrier Feasible?			

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier			
Barrier Area (2,500 feet) x wall height, sq. ft.			
Barrier Cost ($20.00 x Area)			
Cost per benefitting receiver			
Is Barrier Cost Effective?			

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	No	No	No

Table 13A-11. Mitigation Analysis: Barrier 11

Location		# du	No Barrier	15 foot Level	15 foot Decrease	17 foot Level	17 foot Decrease	19 foot Level	19 foot Decrease
1st Row		15	59–63	53–56	4–7	53–56	4–7	53–55	5–8
2nd Row & Beyond		58	54–61	50–55	3–7	50–54	4–7	50–54	4–7

	15 foot	17 foot	19 foot
# benefiting receivers (at least 5 dBA):	49	52	61

	15 foot	17 foot	19 foot
Maximum Reduction:	7	7	8

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	Yes	Yes	Yes

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	3,500		
Barrier Area (3,500 feet) x wall height, sq. ft.	52,500	59,500	66,500
Barrier Cost ($20.00 x Area)	$1,050,000	$1,190,000	$1,330,000
Cost per benefitting receiver	$21,429	$22,885	$21,803
Is Barrier Cost Effective?	Yes	Yes	Yes

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	Yes	Yes	Yes

Table 13A-12. Mitigation Analysis: Barrier 12

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		47	71–77	67–74	2–4	66–73	3–7	64–69	5–9
2nd Row & Beyond		93	55–71	53–68	1–4	53–66	1–6	52–64	2–7

	15 foot	17 foot	19 foot
# benefiting receivers (at least 5 dBA):	0	48	75

	15 foot	17 foot	19 foot
Maximum Reduction:	4	7	9

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	No	Yes	Yes
Is Barrier Feasible?	No	Yes	Yes

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	3,000		
Barrier Area (3,000 feet) x wall height, sq. ft.		51,000	57,000
Barrier Cost ($20.00 x Area)	N/A	$1,020,000	$1,140,000
Cost per benefitting receiver		$21,250	$15,200
Is Barrier Cost Effective?		Yes	Yes

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	No	Yes	Yes

Table 13A-13. Mitigation Analysis: Barrier 13

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		9	69–78	63–71	5–8	62–69	7–9	61–68	7–11
2nd Row & Beyond		35	57–68	53–64	2–5	53–63	2–6	53–63	2–6

# benefiting receivers (at least 5 dBA):	17	21	21

Maximum Reduction:	8	9	11

UDOT Feasibility Requirements	**15 foot**	**17 foot**	**19 foot**

1 rec > 10 dBA reduction from a barrier?	No	No	Yes

75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes

Is Barrier Feasible?	**Yes**	**Yes**	**Yes**

UDOT Cost Effectiveness Requirements	**15 foot**	**17 foot**	**19 foot**
Length of Modeled Barrier	1,500		
Barrier Area (1,500 feet) x wall height, sq. ft.	22,500	25,500	28,500

Barrier Cost ($20.00 x Area)	$450,000	$510,000	$570,000

Cost per benefitting receiver	$26,471	$24,286	$27,143

Is Barrier Cost Effective?	**Yes**	**Yes**	**Yes**

	15 foot	**17 foot**	**19 foot**
Is Barrier Feasible and Cost Effective?	**Yes**	**Yes**	**Yes**

Table 13A-14. Mitigation Analysis: Barrier 14

Location		# du	No Barrier	15 foot Level	15 foot Decrease	17 foot Level	17 foot Decrease	19 foot Level	19 foot Decrease
1st Row		19	63–66	60–65	1–3	60–65	1–4	58–64	2–5
2nd Row & Beyond		109	50–62	47–60	1–3	47–59	1–4	47–58	1–4

# benefiting receivers (at least 5 dBA):	0	0	9

Maximum Reduction:	3	4	5

UDOT Feasibility Requirements	**15 foot**	**17 foot**	**19 foot**
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	No	No	Yes
Is Barrier Feasible?	No	No	**Yes**

UDOT Cost Effectiveness Requirements	**15 foot**	**17 foot**	**19 foot**
Length of Modeled Barrier	2,500		
Barrier Area (2,500 feet) x wall height, sq. ft.			47,500
Barrier Cost ($20.00 x Area)	N/A	N/A	$950,000
Cost per benefitting receiver			$105,556
Is Barrier Cost Effective?			No

	15 foot	**17 foot**	**19 foot**
Is Barrier Feasible and Cost Effective?	**No**	**No**	**No**

Table 13A-15. Mitigation Analysis: Barrier 15

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		21	65–69	59–60	6–10	58–60	6–10	58–59	7–11
2nd Row & Beyond		40	62–66	55–59	5–8	55–59	5–9	55–59	5–9

# benefiting receivers (at least 5 dBA):	61	61	61

Maximum Reduction:	10	10	11

UDOT Feasibility Requirements	15 foot	17 foot	19 foot

1 rec > 10 dBA reduction from a barrier?	Yes	Yes	Yes

75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes

Is Barrier Feasible?	Yes	Yes	Yes

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	2,500		
Barrier Area (2,500 feet) x wall height, sq. ft.	37,500	42,500	47,500

Barrier Cost ($20.00 x Area)	$750,000	$850,000	$950,000

Cost per benefitting receiver	$12,295	$13,934	$15,574

Is Barrier Cost Effective?	Yes	Yes	Yes

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	Yes	Yes	Yes

Table 13A-16. Mitigation Analysis: Barrier 16

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		9	63–64	58–59	5	57–59	5–6	57–59	5–6
2nd Row & Beyond		42	58–64	55–59	3–7	54–59	3–7	54–59	3–7

	15 foot	17 foot	19 foot
# benefiting receivers (at least 5 dBA):	35	37	37

	15 foot	17 foot	19 foot
Maximum Reduction:	7	7	7

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	**Yes**	**Yes**	**Yes**

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	2,000		
Barrier Area (2,000 feet) x wall height, sq. ft.	30,000	34,000	38,000
Barrier Cost ($20.00 x Area)	$600,000	$680,000	$570,000
Cost per benefitting receiver	$17,143	$18,378	$20,541
Is Barrier Cost Effective?	**Yes**	**Yes**	**Yes**

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	**Yes**	**Yes**	**Yes**

Table 13A-17. Mitigation Analysis: Barrier 17

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		10	63–64	58–59	4–5	58–59	4–6	58–59	4–6
2nd Row & Beyond		16	61–62	56–59	3–5	56–59	3–5	56–59	3–5

	15 foot	17 foot	19 foot
# benefiting receivers (at least 5 dBA):	11	11	11

	15 foot	17 foot	19 foot
Maximum Reduction:	5	6	6

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	**Yes**	**Yes**	**Yes**

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	2,000		
Barrier Area (2,000 feet) x wall height, sq. ft.	30,000	34,000	38,000
Barrier Cost ($20.00 x Area)	$600,000	$680,000	$760,000
Cost per benefitting receiver	$54,545	$61,818	$69,091
Is Barrier Cost Effective?	No	No	No

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	**No**	**No**	**No**

Table 13A-18. Mitigation Analysis: Barrier 18

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		6	66–67	62–63	4–5	62–63	4–5	62–63	4–5
2nd Row & Beyond		21	61–66	58–62	2–4	58–62	2–4	58–62	2–4

# benefiting receivers (at least 5 dBA):	2	2	2

Maximum Reduction:	5	5	5

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	No	No	No
Is Barrier Feasible?	No	No	No

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	2,000		
Barrier Area (2,000 feet) x wall height, sq. ft.	N/A	N/A	N/A
Barrier Cost ($20.00 x Area)			
Cost per benefitting receiver			
Is Barrier Cost Effective?			

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	No	No	No

Table 13A-19. Mitigation Analysis: Barrier 19

Location		# du	No Barrier	15 foot Level	15 foot Decrease	17 foot Level	17 foot Decrease	19 foot Level	19 foot Decrease
1st Row		15	64–65	57–62	3–7	56–62	3–8	56–62	3–8
2nd Row & Beyond		17	62–64	55 -60	3–8	55–60	3–8	54–60	3–9

# benefiting receivers (at least 5 dBA):	27	27	27
Maximum Reduction:	7	8	9

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	Yes	Yes	Yes

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	2,500		
Barrier Area (2,500 feet) x wall height, sq. ft.	37,500	42,500	47,500
Barrier Cost ($20.00 x Area)	$750,000	$850,000	$950,000
Cost per benefitting receiver	$27,778	$31,481	$35,185
Is Barrier Cost Effective?	Yes	No	No

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	Yes	No	No

Table 13A-20. Mitigation Analysis: Barrier 20

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		16	65–66	56–59	6–9	56–59	7–9	56–59	7–9
2nd Row & Beyond		63	61–65	53–60	5–9	53–60	5–9	52–60	5–9

# benefiting receivers (at least 5 dBA):	81	81	81

Maximum Reduction:	9	9	9

UDOT Feasibility Requirements	15 foot	17 foot	19 foot

1 rec > 10 dBA reduction from a barrier?	No	No	No

75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes

Is Barrier Feasible?	Yes	Yes	Yes

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	2,500		
Barrier Area (2,500 feet) x wall height, sq. ft.	37,500	42,500	47,500
Barrier Cost ($20.00 x Area)	$750,000	$850,000	$950,000
Cost per benefitting receiver	$9,259	$10,494	$11,728
Is Barrier Cost Effective?	Yes	Yes	Yes

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	Yes	Yes	Yes

Table 13A-21. Mitigation Analysis: Barrier 21

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		28	65–67	58–62	5–7	58–62	5–8	57–62	5–8
2nd Row & Beyond		124	57–66	51–61	2–8	51–61	2–8	51–61	2–8

	15 foot	17 foot	19 foot
# benefiting receivers (at least 5 dBA):	129	129	132

	15 foot	17 foot	19 foot
Maximum Reduction:	8	8	8

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	Yes	Yes	Yes

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	3,500		
Barrier Area (3,500 feet) x wall height, sq. ft.	52,500	59,500	66,500
Barrier Cost ($20.00 x Area)	$1,050,000	$1,190,000	$1,330,000
Cost per benefitting receiver	$8,140	$9,225	$10,076
Is Barrier Cost Effective?	Yes	Yes	Yes

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	Yes	Yes	Yes

Table 13A-22. Mitigation Analysis: Barrier 22

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		25	62–64	56–58	5–6	55–58	6–7	55–58	6–7
2nd Row & Beyond		42	59–63	53–56	5–7	52 -56	5–8	52–56	5–8

# benefiting receivers (at least 5 dBA):	67	67	67

Maximum Reduction:	7	8	8

UDOT Feasibility Requirements	15 foot	17 foot	19 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes
Is Barrier Feasible?	**Yes**	**Yes**	**Yes**

UDOT Cost Effectiveness Requirements	15 foot	17 foot	19 foot
Length of Modeled Barrier	2,500		
Barrier Area (2,500 feet) x wall height, sq. ft.	37,500	42,500	47,500
Barrier Cost ($20.00 x Area)	$750,000	$850,000	$950,000
Cost per benefitting receiver	$11,194	$12,687	$14,179
Is Barrier Cost Effective?	**Yes**	**Yes**	**Yes**

	15 foot	17 foot	19 foot
Is Barrier Feasible and Cost Effective?	**Yes**	**Yes**	**Yes**

Table 13A-23. Mitigation Analysis: Barrier 23

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		25	64–65	58–59	5–6	58–59	5–7	58	6–7
2nd Row & Beyond		57	61–64	55–58	4–7	55–58	4–7	55–57	4–7

# benefiting receivers (at least 5 dBA):	80	80	80

Maximum Reduction:	7	7	7

UDOT Feasibility Requirements	**15 foot**	**17 foot**	**19 foot**

1 rec > 10 dBA reduction from a barrier?	No	No	No

75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes

Is Barrier Feasible?	**Yes**	**Yes**	**Yes**

UDOT Cost Effectiveness Requirements	**15 foot**	**17 foot**	**19 foot**
Length of Modeled Barrier	2,990		
Barrier Area (2,990 feet) x wall height, sq. ft.	44,850	50,830	56,810

Barrier Cost ($20.00 x Area)	$897,000	$1,016,600	$1,136,200

Cost per benefitting receiver	$11,213	$12,708	$14,203

Is Barrier Cost Effective?	**Yes**	**Yes**	**Yes**

	15 foot	**17 foot**	**19 foot**
Is Barrier Feasible and Cost Effective?	**Yes**	**Yes**	**Yes**

Table 13A-24. Mitigation Analysis: Barrier 24

Location		# du	No Barrier	15 foot		17 foot		19 foot	
				Level	Decrease	Level	Decrease	Level	Decrease
1st Row		12	66–70	63–65	2–5	62–65	2–5	62–65	2–5
2nd Row & Beyond		0	0	0	0	0	0	0	0

# benefiting receivers (at least 5 dBA):	4	4	0

Maximum Reduction:	5	5	5

UDOT Feasibility Requirements	**15 foot**	**17 foot**	**19 foot**
1 rec > 10 dBA reduction from a barrier?	No	No	No
75% or more 1st row > 5 dBA reduction?	No	No	No
Is Barrier Feasible?	No	No	No

UDOT Cost Effectiveness Requirements	**15 foot**	**17 foot**	**19 foot**
Length of Modeled Barrier	810		
Barrier Area (810 feet) x wall height, sq. ft.	N/A	N/A	N/A
Barrier Cost ($20.00 x Area)			
Cost per benefitting receiver			
Is Barrier Cost Effective?	No	No	No

	15 foot	**17 foot**	**19 foot**
Is Barrier Feasible and Cost Effective?	**No**	**No**	**No**

Table 13A-25. Mitigation Analysis: Barrier 1 (Southern Freeway – Segment 2)

Location		# du	No Barrier	12 foot		14 foot		16 foot		18 foot		20 foot	
				Level	Decrease	Level	Decrease	Level	Decrease	Level	Decrease	Level	Decrease
1st Row		18	54–65	52–59	2–6	51–58	3–7	51–57	3–8	51–57	3–8	51–56	3–9
2nd Row & Beyond		13	53–62	51–58	2–5	51–57	2–5	50–57	3–6	50–57	3–6	50–56	3–6

# benefiting receivers (at least 5 dBA):				10		14		14		14		22	

Maximum Reduction:				6		7		8		8		9	

UDOT Feasibility Requirements				12 foot		14 foot		16 foot		18 foot		20 foot	
1 rec > 10 dBA reduction from a barrier?				No		No		No		No		No	
75% or more 1st row > 5 dBA reduction?				No		Yes		Yes		Yes		Yes	
Is Barrier Feasible?				**No**		**Yes**		**Yes**		**Yes**		**Yes**	

UDOT Cost Effectiveness Requirements				12 foot		14 foot		16 foot		18 foot		20 foot	
Length of Modeled Barrier				3000									
Barrier Area (3,000 feet) x wall height, sq. ft.						42,000		48,000		54,000		60,000	
Barrier Cost ($20.00 x Area)						$840,000		$960,000		$1,080,000		$1,200,000	
Cost per benefitting receiver						$60,000		$68,571		$77,143		$54,545	
Is Barrier Cost Effective?						No		No		No		No	

				12 foot		14 foot		16 foot		18 foot		20 foot	
Is Barrier Feasible and Cost Effective?				**No**		**No**		**No**		**No**		**No**	

Table 13A-26. Mitigation Analysis: Barrier 2 (Southern Freeway – Segment 3)

Location		# du	No Barrier	12 foot		14 foot		16 foot		18 foot		20 foot	
				Level	Decrease	Level	Decrease	Level	Decrease	Level	Decrease	Level	Decrease
1st Row		43	65–73	58–64	7–10	57–63	8–11	57–63	8–12	56–62	9–13	56–62	9–13
2nd Row & Beyond		39	59–66	55–60	3–7	54–60	4–8	54–59	4–9	53–59	5–9	53–59	5–10

# benefiting receivers (at least 5 dBA):				79		79		79		82		82	

Maximum Reduction:				10		11		12		13		13	

UDOT Feasibility Requirements				**12 foot**		**14 foot**		**16 foot**		**18 foot**		**20 foot**	
1 rec > 10 dBA reduction from a barrier?				Yes		Yes		Yes		Yes		Yes	
75% or more 1st row > 5 dBA reduction?				Yes		Yes		Yes		Yes		Yes	
Is Barrier Feasible?				**Yes**		**Yes**		**Yes**		**Yes**		**Yes**	

UDOT Cost Effectiveness Requirements				**12 foot**		**14 foot**		**16 foot**		**18 foot**		**20 foot**	
Length of Modeled Barrier				4,500									
Barrier Area (4,500 feet) x wall height, sq. ft.				54,000		63,000		72,000		81,000		90,000	
Barrier Cost ($20.00 x Area)				1,080,000		$1,260,000		$1,440,000		$1,620,000		$1,800,000	
Cost per benefitting receiver				$13,671		$15,949		$18,228		$19,756		$21,951	
Is Barrier Cost Effective?				**Yes**		**Yes**		**Yes**		**Yes**		**Yes**	

				12 foot		**14 foot**		**16 foot**		**18 foot**		**20 foot**	
Is Barrier Feasible and Cost Effective?				**Yes**		**Yes**		**Yes**		**Yes**		**Yes**	

Table 13A-27. Mitigation Analysis: Barrier 3 (Southern Freeway – Segment 3)

Location		# du	No Barrier	12 foot Level	12 foot Decrease	14 foot Level	14 foot Decrease	16 foot Level	16 foot Decrease	18 foot Level	18 foot Decrease	20 foot Level	20 foot Decrease
1st Row		9	63–65	58–59	5–7	57–59	5–8	57–59	5–8	57–58	6–8	57–58	6–8
2nd Row & Beyond		12	56–60	54–56	2–4	54–56	2–5	54–56	2–5	54–56	4–5	53–56	4–5

# benefiting receivers (at least 5 dBA):				9		12		12		12		15	

Maximum Reduction:				7		8							

UDOT Feasibility Requirements				**12 foot**		**14 foot**		**16 foot**		**18 foot**		**20 foot**	

1 rec > 10 dBA reduction from a barrier?				No		No		No		No		No	

75% or more 1st row > 5 dBA reduction?				Yes		Yes		Yes		Yes		Yes	

Is Barrier Feasible?				**Yes**		**Yes**		**Yes**		**Yes**		**Yes**	

UDOT Cost Effectiveness Requirements				**12 foot**		**14 foot**		**16 foot**		**18 foot**		**20 foot**	
Length of Modeled Barrier				2,150									
Barrier Area (2,150 feet) x wall height, sq. ft.				25,800		30,100		34,400		38,700		43,000	

Barrier Cost ($20.00 x Area)				$516,000		$602,000		$688,000		$774,000		$860,000	

Cost per benefitting receiver				$57,333		$50,167		$57,333		$64,500		$57,333	

Is Barrier Cost Effective?				No		No		No		No		**No**	

				12 foot		**14 foot**		**16 foot**		**18 foot**		**20 foot**	
Is Barrier Feasible and Cost Effective?				**No**		**No**		**No**		**No**		**No**	

Table 13A-28. Mitigation Analysis: Barrier 4 (2100 North Freeway)

Location		# du	No Barrier	12 foot Level	12 foot Decrease	14 foot Level	14 foot Decrease	16 foot Level	16 foot Decrease	18 foot Level	18 foot Decrease	20 foot Level	20 foot Decrease
1st Row		13	61–62	58–59	3–4	57–58	3–5	57–58	3–5	57–58	3–5	57–58	3–5
2nd Row & Beyond		4	60	57	3	56–57	3–4	56–57	3–4	56–57	3–4	56–57	3–4

	12 foot	14 foot	16 foot	18 foot	20 foot
# benefiting receivers (at least 5 dBA):	0	2	4	4	6

	12 foot	14 foot	16 foot	18 foot	20 foot
Maximum Reduction:	4	5	5	6	

UDOT Feasibility Requirements	**12 foot**	**14 foot**	**16 foot**	**18 foot**	**20 foot**
1 rec > 10 dBA reduction from a barrier?	No	No	No	No	No
75% or more 1st row > 5 dBA reduction?	No	No	No	No	Yes
Is Barrier Feasible?	**No**	**No**	**No**	**No**	**Yes**

UDOT Cost Effectiveness Requirements	**12 foot**	**14 foot**	**16 foot**	**18 foot**	**20 foot**
Length of Modeled Barrier	2,000				
Barrier Area (2,000 feet) x wall height, sq. ft.					40,000
Barrier Cost ($20.00 x Area)					$800,000
Cost per benefitting receiver					$133,333
Is Barrier Cost Effective?	No	No	No	No	**No**

	12 foot	**14 foot**	**16 foot**	**18 foot**	**20 foot**
Is Barrier Feasible and Cost Effective?	**No**	**No**	**No**	**No**	**No**

Table 13A-29. Mitigation Analysis: Barrier 5 (2100 North Freeway)

Location		# du	No Barrier	12 foot Level	12 foot Decrease	14 foot Level	14 foot Decrease	16 foot Level	16 foot Decrease	18 foot Level	18 foot Decrease	20 foot Level	20 foot Decrease
1st Row		16	64–72	60–64	4–8	60–63	4–9	60–63	4–9	59–62	5–10	59–61	5–11
2nd Row & Beyond		52	61–68	57–63	4–6	57–62	4–7	57–62	4–7	56–62	4–7	56–62	4–8

	12 foot	14 foot	16 foot	18 foot	20 foot
# benefiting receivers (at least 5 dBA):	38	50	52	62	64
Maximum Reduction:	8	9	9	10	11

UDOT Feasibility Requirements	12 foot	14 foot	16 foot	18 foot	20 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No	Yes	Yes
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes	Yes	Yes
Is Barrier Feasible?	Yes	Yes	Yes	Yes	Yes

UDOT Cost Effectiveness Requirements	12 foot	14 foot	16 foot	18 foot	20 foot
Length of Modeled Barrier	2,500				
Barrier Area (2,500 feet) x wall height, sq. ft.	30,000	35,000	40,000	45,000	50,000
Barrier Cost ($20.00 x Area)	$600,000	$700,000	$800,000	$900,000	$1,000,000
Cost per benefitting receiver	$15,789	$14,000	$15,385	$14,516	$15,625
Is Barrier Cost Effective?	Yes	Yes	Yes	Yes	Yes

	12 foot	14 foot	16 foot	18 foot	20 foot
Is Barrier Feasible and Cost Effective?	Yes	Yes	Yes	Yes	Yes

Table 13A-30. Mitigation Analysis: Barrier 6 (2100 North Freeway)

Location		# du	No Barrier	12 foot Level	12 foot Decrease	14 foot Level	14 foot Decrease	16 foot Level	16 foot Decrease	18 foot Level	18 foot Decrease	20 foot Level	20 foot Decrease
1st Row		10	62–68	56–64	4–8	55–64	4–9	55–64	4–9	54–64	4–10	54–64	4–10
2nd Row & Beyond		26	52–64	49–61	2–7	48–61	2–8	48–60	2–8	48–60	2–8	47–60	2–8

				12 foot		14 foot		16 foot		18 foot		20 foot	
# benefiting receivers (at least 5 dBA):				22		24		24		24		26	
Maximum Reduction:				8		9		9		10		10	

UDOT Feasibility Requirements				**12 foot**		**14 foot**		**16 foot**		**18 foot**		**20 foot**	
1 rec > 10 dBA reduction from a barrier?				No		No		No		Yes		Yes	
75% or more 1st row > 5 dBA reduction?				Yes		Yes		Yes		Yes		Yes	
Is Barrier Feasible?				**Yes**		**Yes**		**Yes**		**Yes**		**Yes**	

UDOT Cost Effectiveness Requirements				**12 foot**		**14 foot**		**16 foot**		**18 foot**		**20 foot**	
Length of Modeled Barrier				1,265									
Barrier Area (1,265 feet) x wall height, sq. ft.				15,180		17,710		20,240		22,770		25,300	
Barrier Cost ($20.00 x Area)				$303,600		$354,200		$404,800		$455,400		$506,000	
Cost per benefitting receiver				$13,800		$14,758		$16,867		$18,975		$19,462	
Is Barrier Cost Effective?				**Yes**		**Yes**		**Yes**		**Yes**		**Yes**	

				12 foot		**14 foot**		**16 foot**		**18 foot**		**20 foot**	
Is Barrier Feasible and Cost Effective?				**Yes**		**Yes**		**Yes**		**Yes**		**Yes**	

Table 13A-31. Mitigation Analysis: Barrier 7 (Arterials – Segment 3)

Location		# du	No Barrier	12 foot Level	12 foot Decrease	14 foot Level	14 foot Decrease	16 foot Level	16 foot Decrease	18 foot Level	18 foot Decrease	20 foot Level	20 foot Decrease
1st Row		43	66–74	59–65	7–10	59–64	7–11	58–64	9–12	57–63	9–12	57–63	10–13
2nd Row & Beyond		42	60–67	56–62	2–7	56–61	4–8	55–60	4–9	54–60	4–9	54–60	5–10

		12 foot	14 foot	16 foot	18 foot	20 foot
# benefiting receivers (at least 5 dBA):		76	82	82	82	85
Maximum Reduction:		10	11	12	12	13

UDOT Feasibility Requirements	12 foot	14 foot	16 foot	18 foot	20 foot
1 rec > 10 dBA reduction from a barrier?	Yes	Yes	Yes	Yes	Yes
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes	Yes	Yes
Is Barrier Feasible?	Yes	Yes	Yes	Yes	Yes

UDOT Cost Effectiveness Requirements	12 foot	14 foot	16 foot	18 foot	20 foot
Length of Modeled Barrier	4,500				
Barrier Area (4,500 feet) x wall height, sq. ft.	54,000	63,000	72,000	81,000	90,000
Barrier Cost ($20.00 x Area)	$1,080,000	$1,260,000	$1,440,000	$1,620,000	$1,800,000
Cost per benefitting receiver	$14,211	$15,366	$17,561	$19,756	$21,176
Is Barrier Cost Effective?	Yes	Yes	Yes	Yes	Yes

	12 foot	14 foot	16 foot	18 foot	20 foot
Is Barrier Feasible and Cost Effective?	Yes	Yes	Yes	Yes	Yes

Table 13A-32. Mitigation Analysis: Barrier 8 (Arterials – Segment 4)

Location		# du	No Barrier	12 foot		14 foot		16 foot		18 foot		20 foot	
				Level	Decrease	Level	Decrease	Level	Decrease	Level	Decrease	Level	Decrease
1st Row		9	64–67	59 -60	5–7	58–60	5–8	58–59	6–8	58–59	6–8	57–59	6–9
2nd Row & Beyond		12	57–61	54–57	1–5	54–57	2–5	54–57	2–6	54–56	2–5	54–56	2–6

# benefiting receivers (at least 5 dBA):	12	12	12	15	15

Maximum Reduction:	7	8	8	8	9

UDOT Feasibility Requirements	12 foot	14 foot	16 foot	18 foot	20 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No	No	No
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes	Yes	Yes
Is Barrier Feasible?	Yes	Yes	Yes	Yes	Yes

UDOT Cost Effectiveness Requirements	12 foot	14 foot	16 foot	18 foot	20 foot
Length of Modeled Barrier	2,150				
Barrier Area (2,150 feet) x wall height, sq. ft.	25,800	30,100	34,400	38,700	43,000
Barrier Cost ($20.00 x Area)	$516,000	$602,000	$688,000	$774,000	$860,000
Cost per benefitting receiver	$43,000	$50,167	$57,333	$51,600	$57,333
Is Barrier Cost Effective?	No	No	No	No	No

	12 foot	14 foot	16 foot	18 foot	20 foot
Is Barrier Feasible and Cost Effective?	No	No	No	No	No

Table 13A-33. Mitigation Analysis: Barrier 9 (Arterials – Segment 6)

Location		# du	No Barrier	12 foot		14 foot		16 foot		18 foot		20 foot	
				Level	Decrease	Level	Decrease	Level	Decrease	Level	Decrease	Level	Decrease
1st Row		13	58 -59	55–56	2–4	55–56	2–4	55–56	2–4	55–56	2–4	55–56	2–4
2nd Row & Beyond		4	58	55	3	54–55	3–4	54–55	3–4	54–55	3–4	54–55	3–4

# benefiting receivers (at least 5 dBA):	0	0	0	0	0
Maximum Reduction:	4	4	4	4	4

UDOT Feasibility Requirements	12 foot	14 foot	16 foot	18 foot	20 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No	No	No
75% or more 1st row > 5 dBA reduction?	No	No	No	No	No
Is Barrier Feasible?	**No**	**No**	**No**	**No**	**No**

UDOT Cost Effectiveness Requirements	12 foot	14 foot	16 foot	18 foot	20 foot
Length of Modeled Barrier	2,000				
Barrier Area (2,000 feet) x wall height, sq. ft.					
Barrier Cost ($20.00 x Area)					
Cost per benefitting receiver					
Is Barrier Cost Effective?					

	12 foot	14 foot	16 foot	18 foot	20 foot
Is Barrier Feasible and Cost Effective?	**No**	**No**	**No**	**No**	**No**

Table 13A-34. Mitigation Analysis: Barrier 10 (Arterials – Segment 6)

Location		# du	No Barrier	12 foot		14 foot		16 foot		18 foot		20 foot	
				Level	Decrease	Level	Decrease	Level	Decrease	Level	Decrease	Level	Decrease
1st Row		14	62–68	58–62	4–6	58–61	4–7	57–60	5–8	57–60	5–8	57–59	5–9
2nd Row & Beyond		58	59–65	56–61	3–6	56–60	3–6	54–60	4–7	55–60	4–8	54–60	4–8

# benefiting receivers (at least 5 dBA):	34	46	58	60	60

Maximum Reduction:	6	7	8	8	8

UDOT Feasibility Requirements	12 foot	14 foot	16 foot	18 foot	20 foot
1 rec > 10 dBA reduction from a barrier?	No	No	No	No	No
75% or more 1st row > 5 dBA reduction?	Yes	Yes	Yes	Yes	Yes
Is Barrier Feasible?	Yes	Yes	Yes	Yes	Yes

UDOT Cost Effectiveness Requirements	12 foot	14 foot	16 foot	18 foot	20 foot
Length of Modeled Barrier	2,500				
Barrier Area (2,500 feet) x wall height, sq. ft.	30,000	35,000	40,000	45,000	50,000
Barrier Cost ($20.00 x Area)	$600,000	$700,000	$800,000	$900,000	$1,000,000
Cost per benefitting receiver	$17,647	$15,217	$13,793	$15,000	$16,667
Is Barrier Cost Effective?	Yes	Yes	Yes	Yes	Yes

	12 foot	14 foot	16 foot	18 foot	20 foot
Is Barrier Feasible and Cost Effective?	Yes	Yes	Yes	Yes	Yes