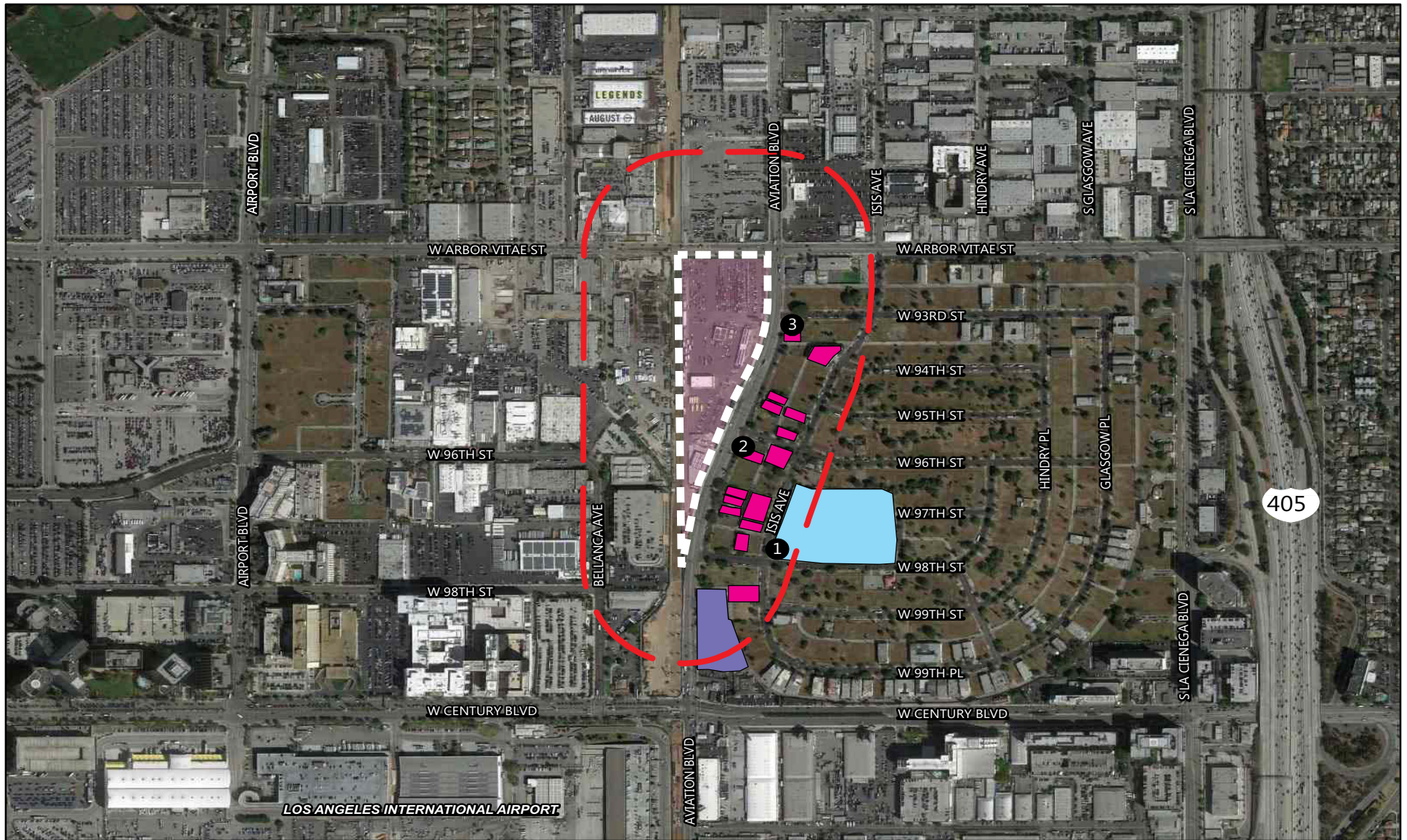


APPENDIX D

Noise and Vibration Calculations

Locations

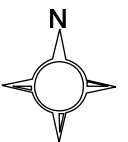


LEGEND

- Project Site Boundary
- 500-ft Buffer
- Residences within 500 feet of Project Site
- Bright Star Secondary Charter Academy
- Travelodge Hotel LAX (5447 W Century Blvd)

- # Noise Monitoring Locations
- 1. Bright Star Secondary Charter Academy
- 2. Single-Family Residence (9608-9612 Aviation Blvd)
- 3. Single-Family Residence (9302 Aviation Blvd)

Approximate Scale



Location 1

9/29/2016

Information Panel

Name	Location 1
Start Time	Wednesday, January 20, 2016 14:26:22
Stop Time	Wednesday, January 20, 2016 14:41:23

General Data Panel

<u>Description</u>	<u>Meter</u>	<u>Value</u>	<u>Description</u>	<u>Meter</u>	<u>Value</u>
Lmax	1	79.8 dB	Leq	1	63.3 dB
Lmin	1	52.6 dB	Weighting	1	A
Response	1	SLOW	Exchange Rate	1	3 dB

Location 2

9/29/2016

Information Panel

Name	Location 2
Start Time	Wednesday, January 20, 2016 14:01:11
Stop Time	Wednesday, January 20, 2016 14:16:34

General Data Panel

<u>Description</u>	<u>Meter</u>	<u>Value</u>	<u>Description</u>	<u>Meter</u>	<u>Value</u>
Lmax	1	82.7 dB	Lmin	1	52.7 dB
Leq	1	70 dB	Weighting	1	A
Response	1	SLOW	Exchange Rate	1	3 dB

Location 3

9/29/2016

Information Panel

Start Time	Wednesday, January 20, 2016 14:53:41
Stop Time	Wednesday, January 20, 2016 15:08:51
Name	Location 3

General Data Panel

<u>Description</u>	<u>Meter</u>	<u>Value</u>	<u>Description</u>	<u>Meter</u>	<u>Value</u>
Lmax	1	76.4 dB	Lmin	1	56.1 dB
Leq	1	68.6 dB	Weighting	1	A
Response	1	SLOW	Exchange Rate	1	3 dB

Existing

Federal Transit Administration
Noise Impact Assessment Spreadsheet
Copyright 2007 HMMH Inc.
version: 7/3/2007

Project:	Airport Metro Connector
----------	-------------------------

Receiver Parameters	
Receiver:	Reciever 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	2

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35
	Avg. Number of Events/hr	24
Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35

	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	570
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	720
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Noise Impact Criteria (FTA Manual, Fig 3-1)

Project Results Summary

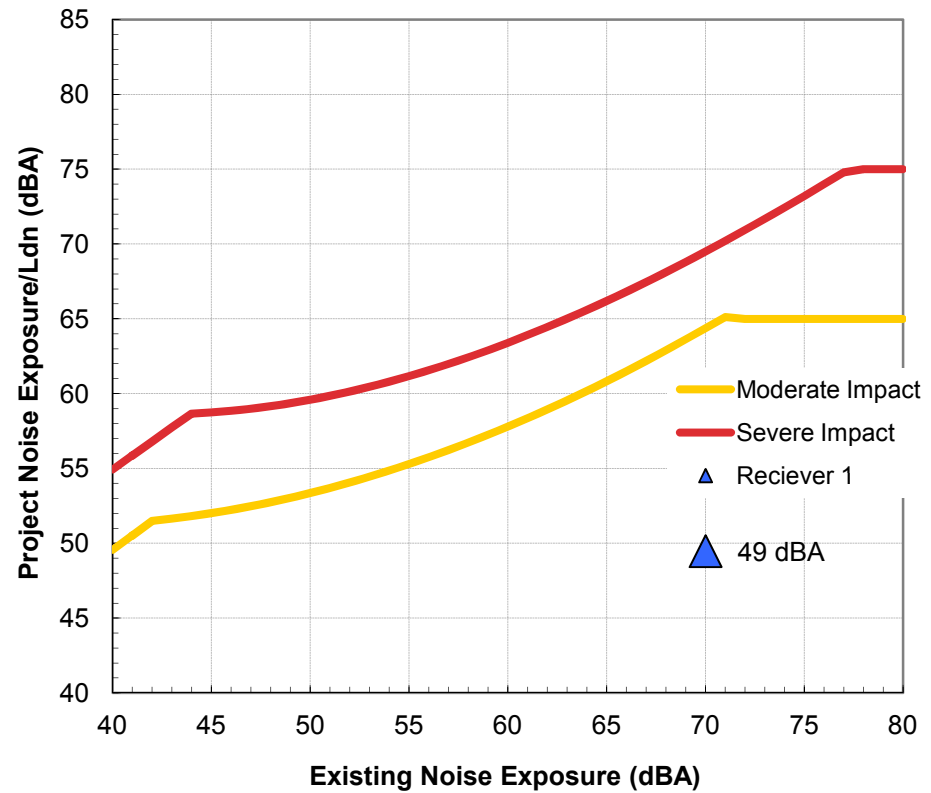
Existing Ldn:	70 dBA
Total Project Ldn:	49 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

Distance to Impact Contours

Dist to Mod. Impact Contour (Sources 1+2):	--
Dist to Sev. Impact Contour (Sources 1+2):	--

Source 1 Results

Leq(day):	47.3 dBA
Leq(night):	41.3 dBA
Ldn:	49.2 dBA



Source 2 Results

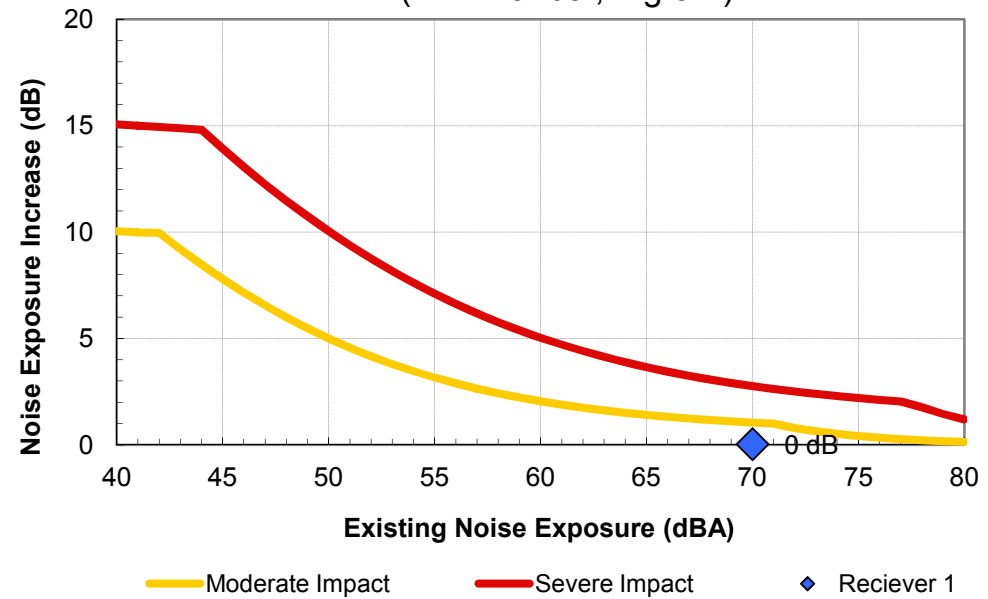
Leq(day): 34.9 dBA

Leq(night): 29.7 dBA

Ldn: 37.3 dBA

Incremental Ldn (Src 1-2): 49.5 dBA

Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



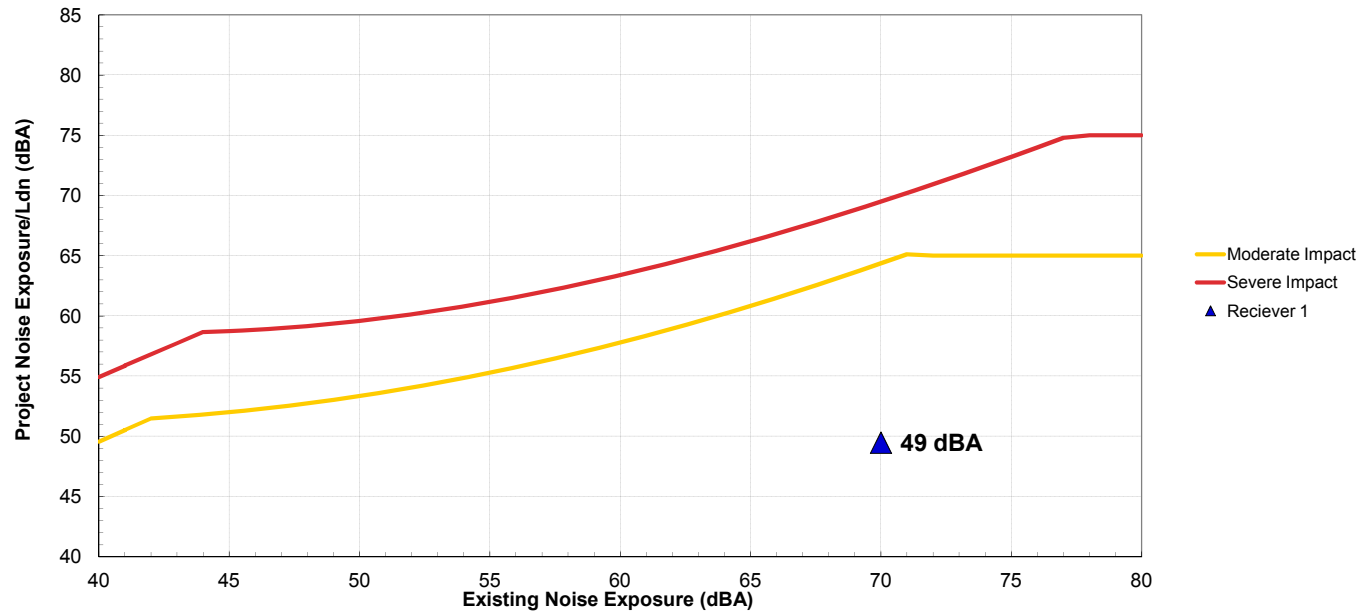
Project: Airport Metro Connector
Receiver: Receiver 1

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	570 ft	49.2 dBA	70 dBA
2 Crossing Signals	720 ft	37.3 dBA	70 dBA
3 --	87 ft		70 dBA
4 --	70 ft		70 dBA
5 --	ft		70 dBA
6 --	ft		70 dBA
Combined Sources		49 dBA	70 dBA

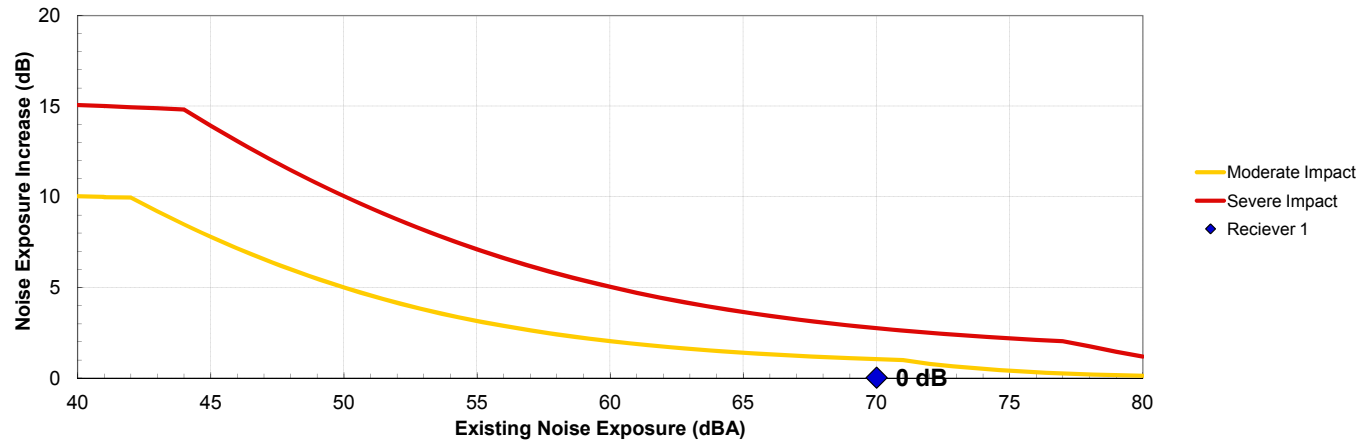
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

d1	64
d2	110
	87

Federal Transit Administration
Noise Impact Assessment Spreadsheet
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version: 7/3/2007

Project:	Airport Metro Connector
----------	-------------------------

Receiver Parameters	
Receiver:	Reciever 2
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	2

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35
	Avg. Number of Events/hr	24
Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35

	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	440
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	918
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Impact Criteria (FTA Manual, Fig 3-1)

Project Results Summary

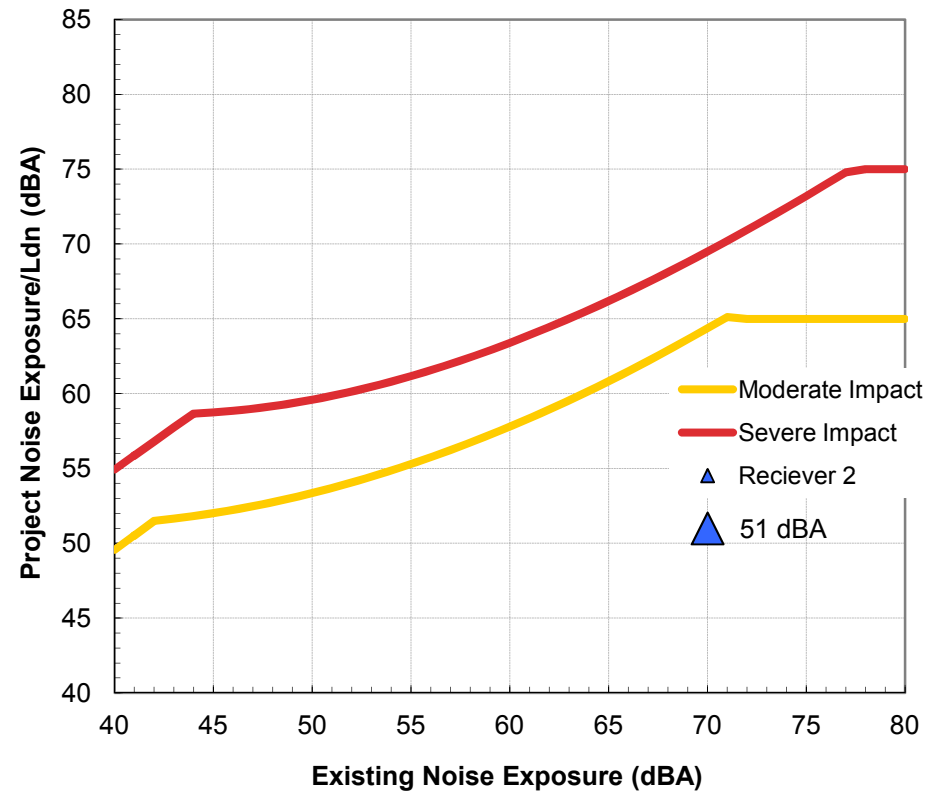
Existing Ldn:	70 dBA
Total Project Ldn:	51 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

Distance to Impact Contours

Dist to Mod. Impact Contour (Sources 1+2):	--
Dist to Sev. Impact Contour (Sources 1+2):	--

Source 1 Results

Leq(day):	49.0 dBA
Leq(night):	42.9 dBA
Ldn:	50.9 dBA



Source 2 Results

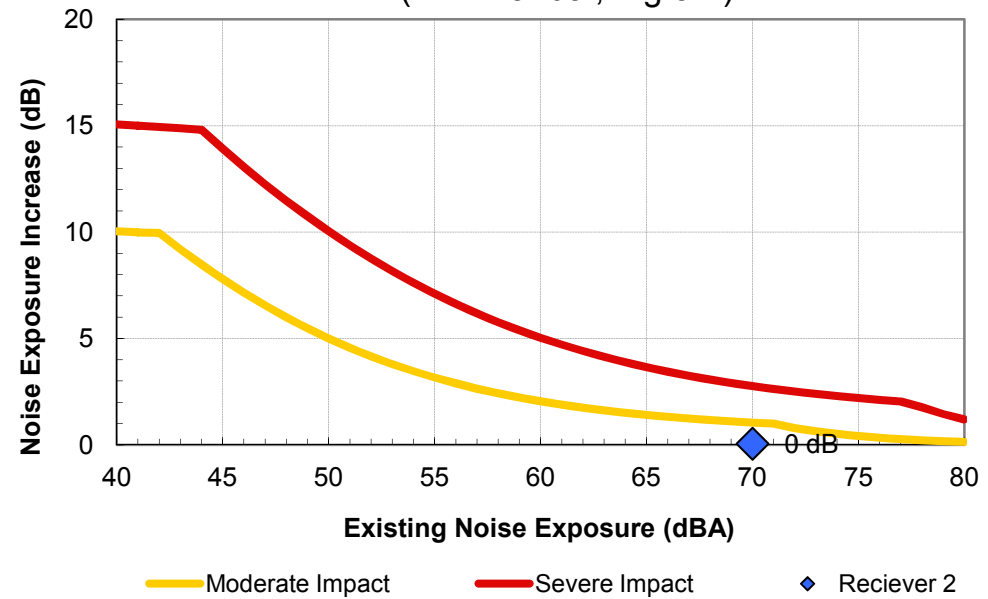
Leq(day): 32.3 dBA

Leq(night): 27.0 dBA

Ldn: 34.7 dBA

Incremental Ldn (Src 1-2): 51.0 dBA

Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



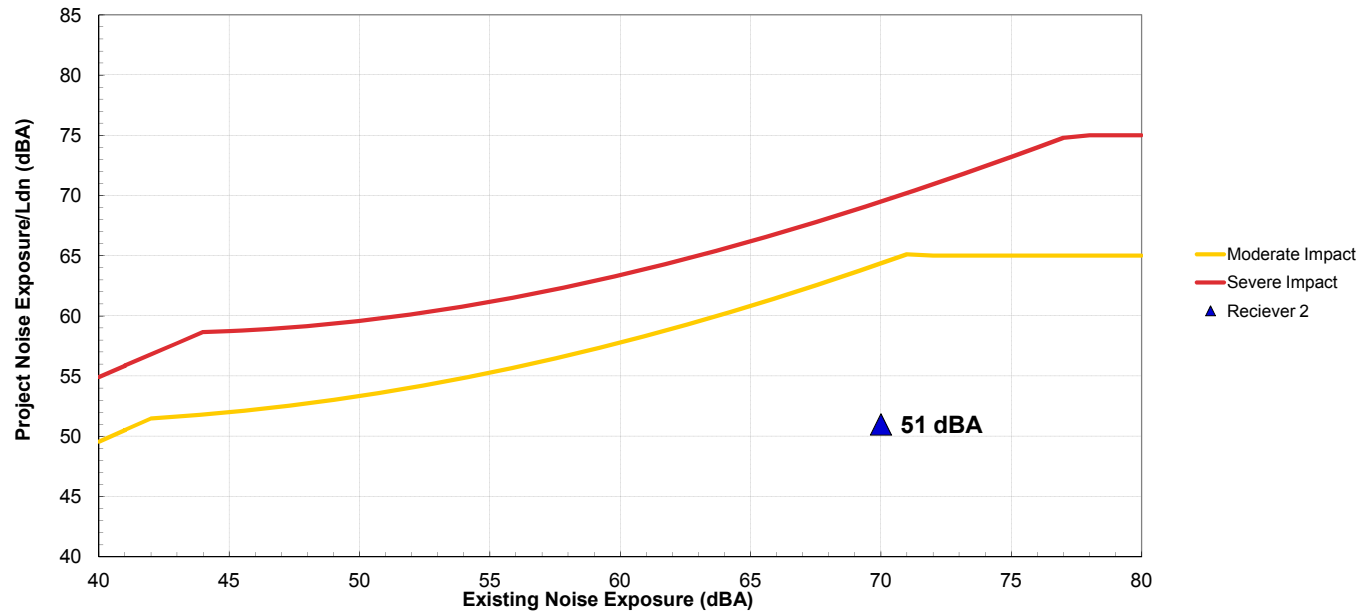
Project: Airport Metro Connector
Receiver: Receiver 2

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	440 ft	50.9 dBA	70 dBA
2 Crossing Signals	918 ft	34.7 dBA	70 dBA
3 --	724 ft		70 dBA
4 --	70 ft		70 dBA
5 --	ft		70 dBA
6 --	ft		70 dBA
Combined Sources		51 dBA	70 dBA

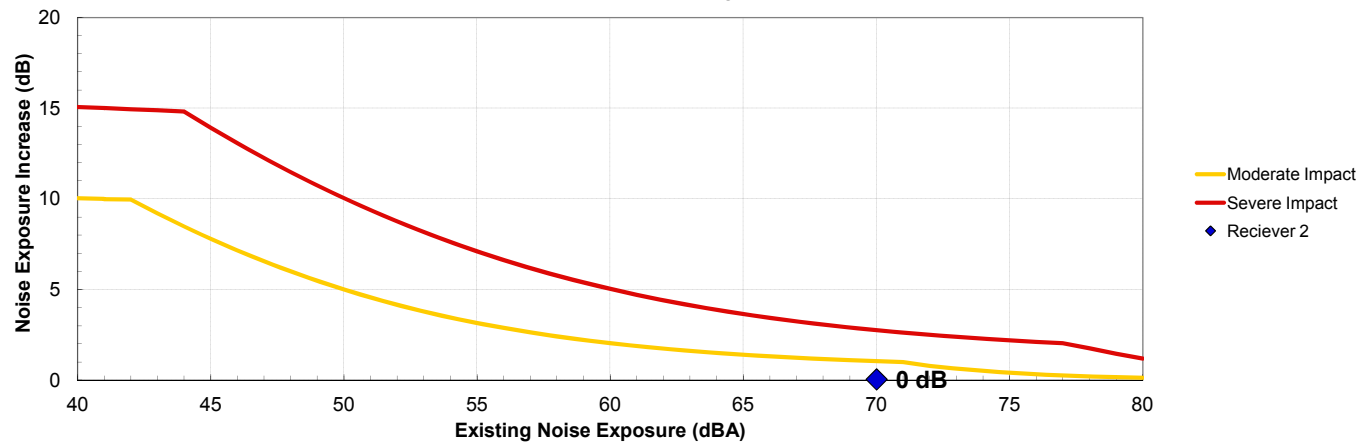
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

Time (Min)
Train Headway 5

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

Mobile Source Average Distance	
D1	60
D2	107
Average	83.5

Federal Transit Administration
Noise Impact Assessment Spreadsheet
Copyright 2007 HMMH Inc.
version: 7/3/2007

Project:	Airport Metro Connector
----------	-------------------------

Receiver Parameters	
Receiver:	Reciever 3
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	2

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35
	Avg. Number of Events/hr	24
Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35

	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	240
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	1350
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Impact Criteria (FTA Manual, Fig 3-1)

Project Results Summary

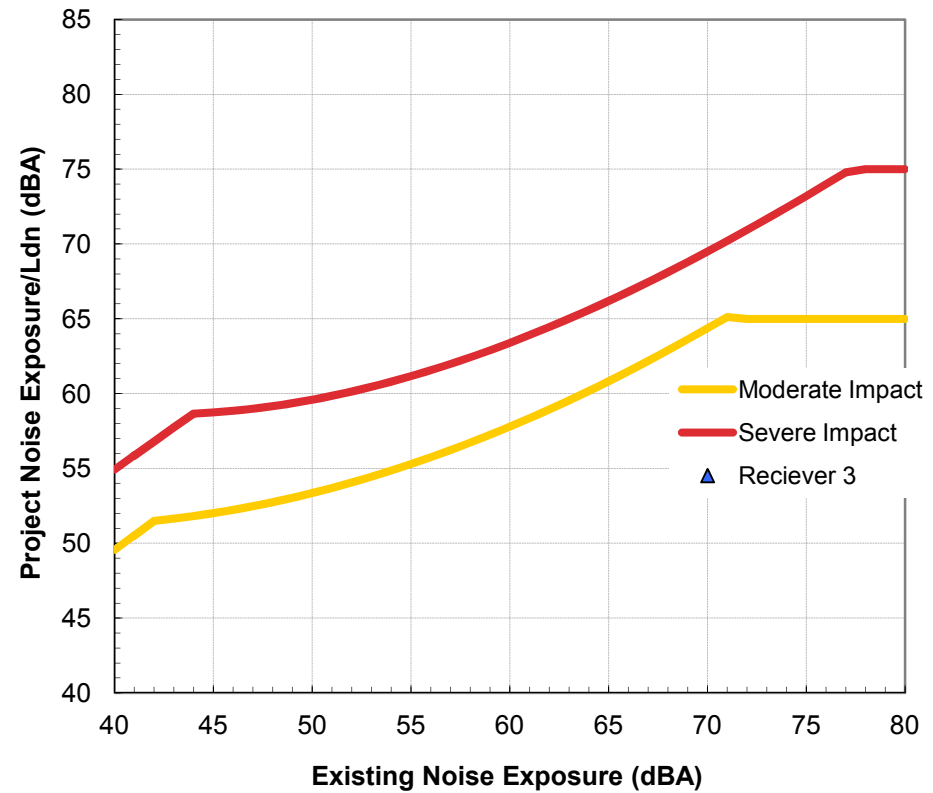
Existing Ldn:	70 dBA
Total Project Ldn:	55 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

Distance to Impact Contours

Dist to Mod. Impact Contour (Sources 1+2):	--
Dist to Sev. Impact Contour (Sources 1+2):	--

Source 1 Results

Leq(day):	52.9 dBA
Leq(night):	46.9 dBA
Ldn:	54.8 dBA



Source 2 Results

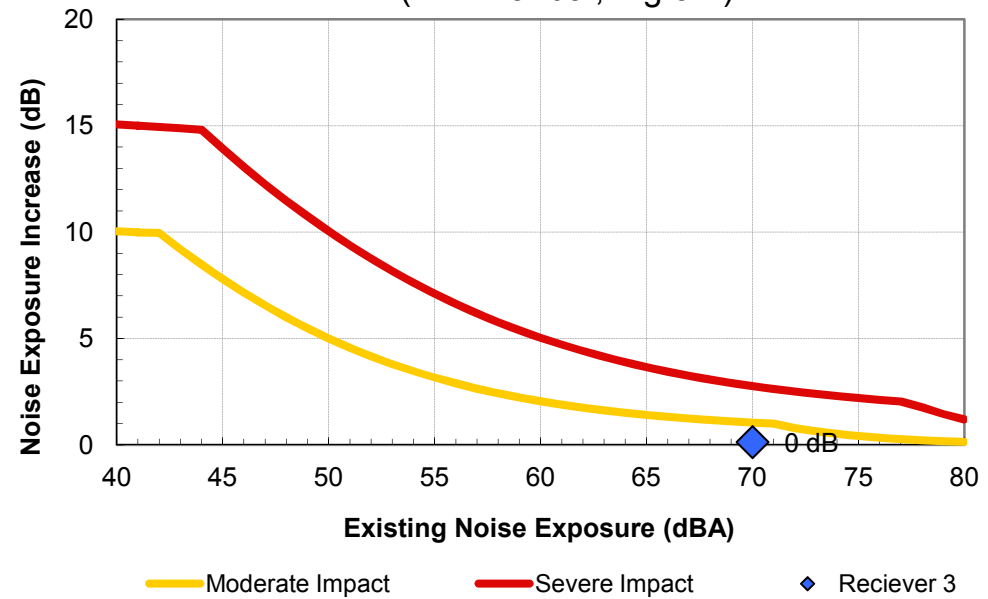
Leq(day): 28.1 dBA

Leq(night): 22.8 dBA

Ldn: 30.5 dBA

Incremental Ldn (Src 1-2): 54.9 dBA

Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



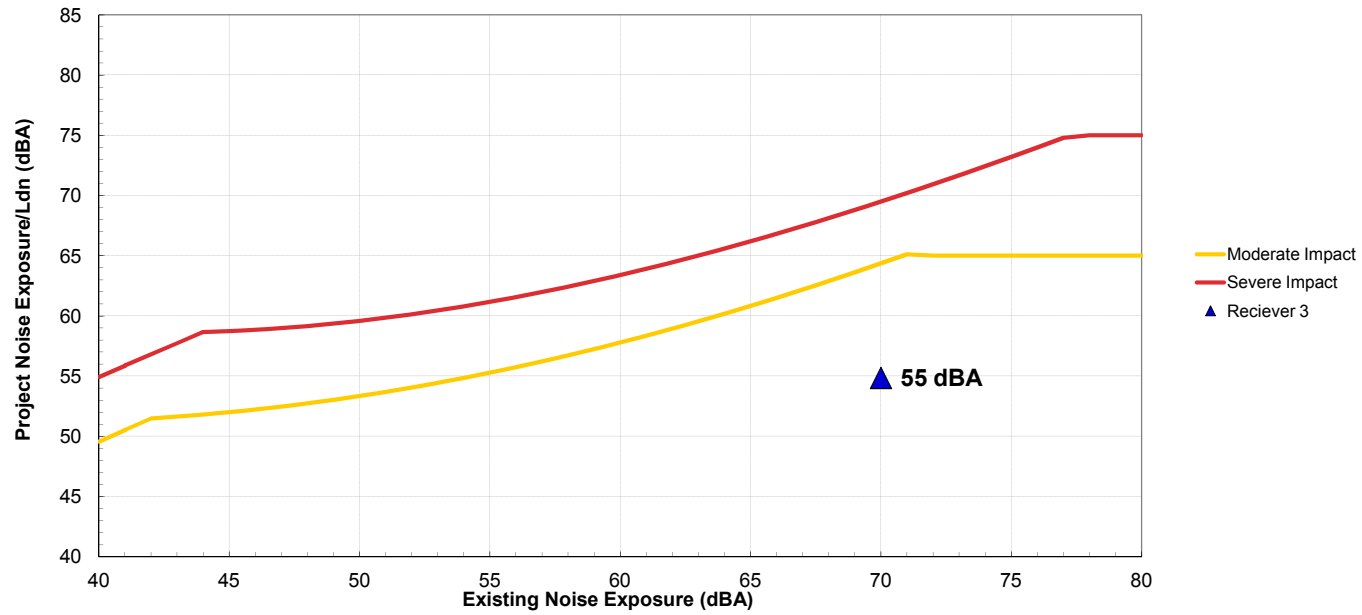
Project: Airport Metro Connector
Receiver: Receiver 3

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	240 ft	54.8 dBA	70 dBA
2 Crossing Signals	1350 ft	30.5 dBA	70 dBA
3 --	724 ft		70 dBA
4 --	70 ft		70 dBA
5 --	ft		70 dBA
6 --	ft		70 dBA
Combined Sources		55 dBA	70 dBA

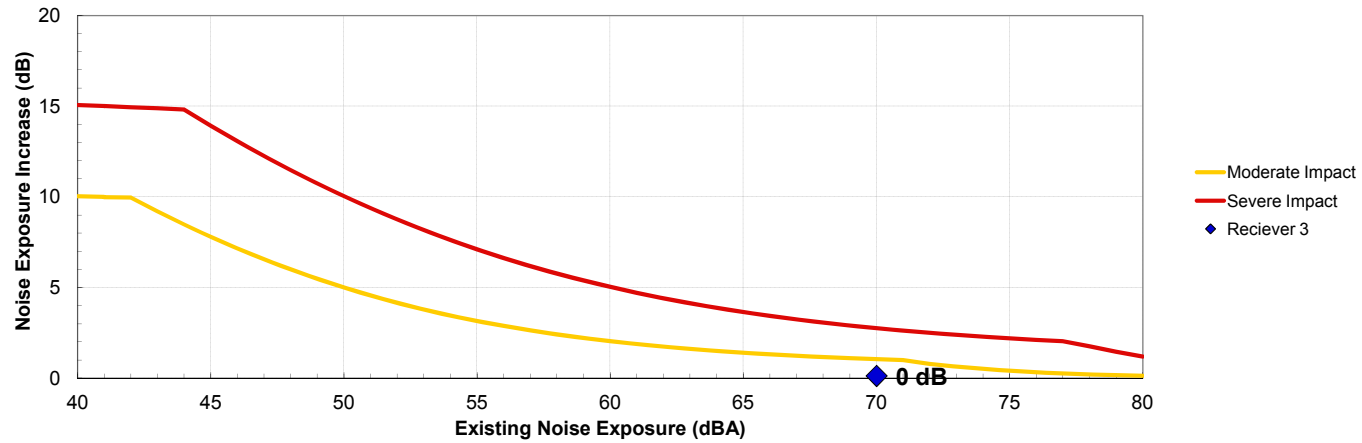
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

Time (Min)
Train Headway 5

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

Mobile Source Average Distance	
D1	60
D2	107
Average	83.5

Federal Transit Administration
Noise Impact Assessment Spreadsheet
Copyright 2007 HMMH Inc.
version: 7/3/2007

Project:	Airport Metro Connector
----------	-------------------------

Receiver Parameters	
Receiver:	Reciever 4 (Travelodge Hotel)
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	2

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35
	Avg. Number of Events/hr	24
Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35

	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	123
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	Yes

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	1900
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Impact Criteria (FTA Manual, Fig 3-1)

Project Results Summary

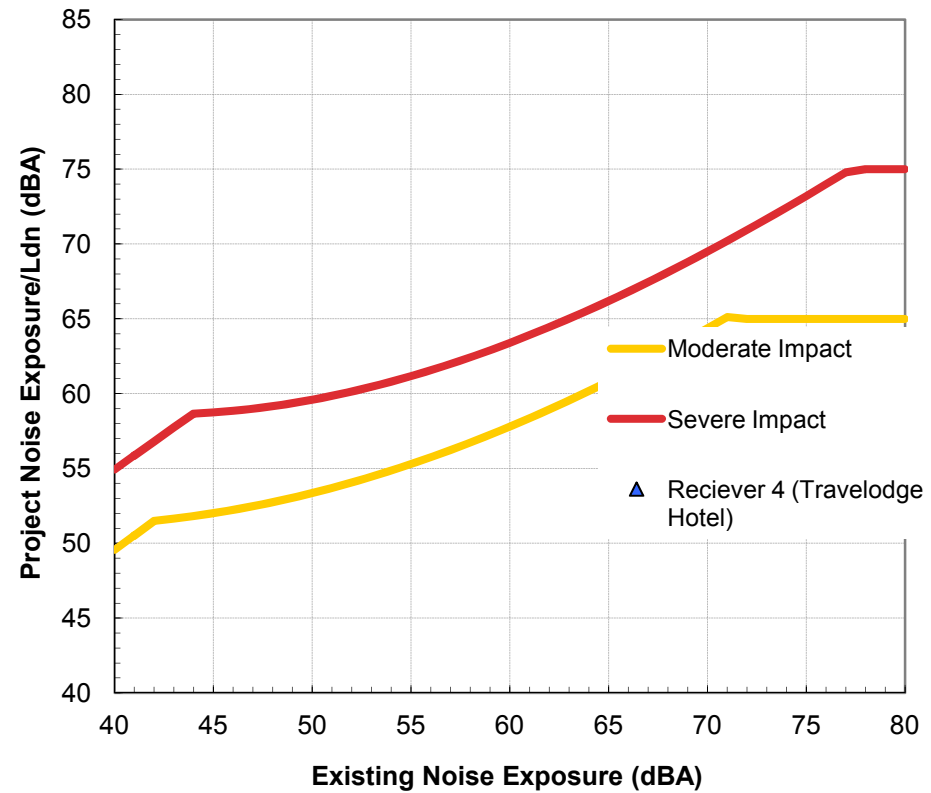
Existing Ldn:	70 dBA
Total Project Ldn:	63 dBA
Total Noise Exposure:	71 dBA
Increase:	1 dB
Impact?:	None

Distance to Impact Contours

Dist to Mod. Impact Contour (Sources 1+2):	--
Dist to Sev. Impact Contour (Sources 1+2):	--

Source 1 Results

Leq(day):	61.3 dBA
Leq(night):	55.2 dBA
Ldn:	63.2 dBA



Source 2 Results

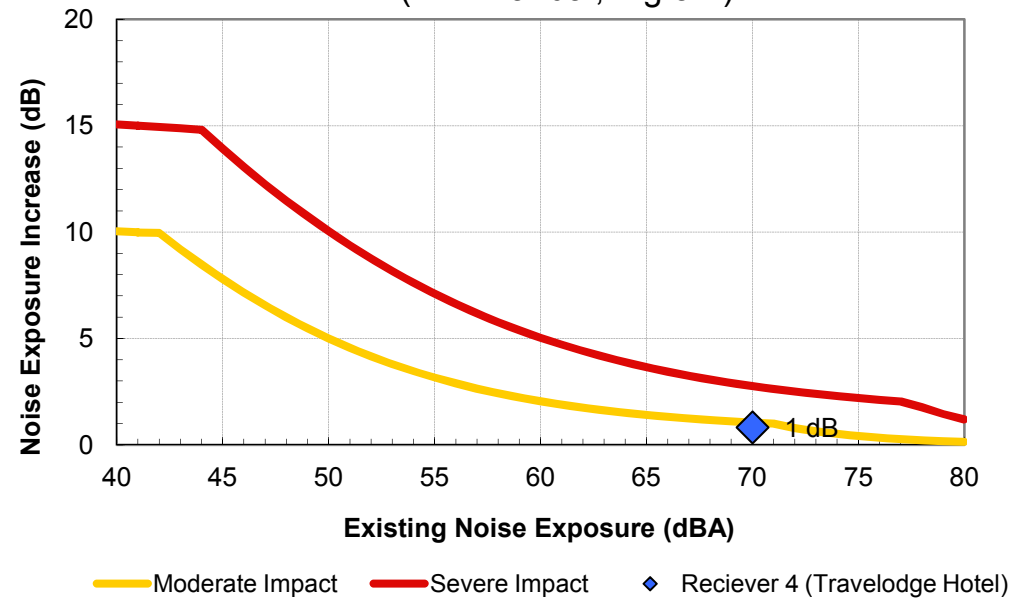
Leq(day): 24.4 dBA

Leq(night): 19.1 dBA

Ldn: 26.8 dBA

Incremental Ldn (Src 1-2): 63.2 dBA

Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



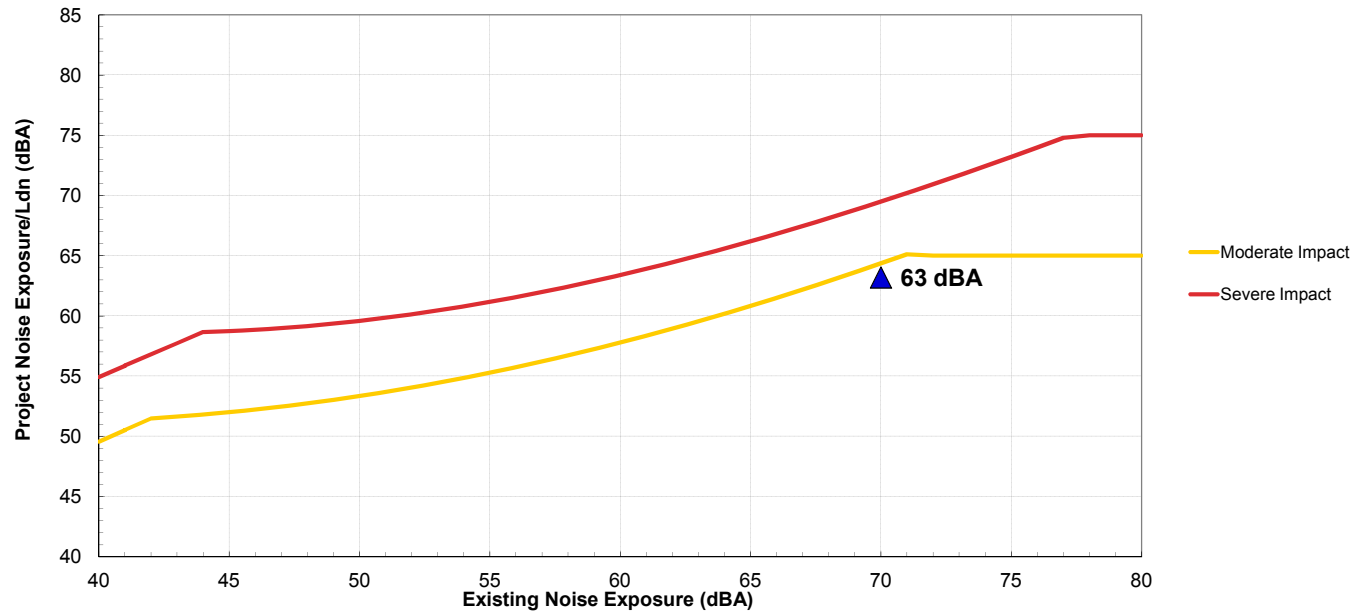
Project: Airport Metro Connector
Receiver: Reciever 4 (Travelodge Hotel)

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	123 ft	63.2 dBA	70 dBA
2 Crossing Signals	1900 ft	26.8 dBA	70 dBA
3 --	724 ft		70 dBA
4 --	70 ft		70 dBA
5 --	ft		70 dBA
6 --	ft		70 dBA
Combined Sources		63 dBA	70 dBA

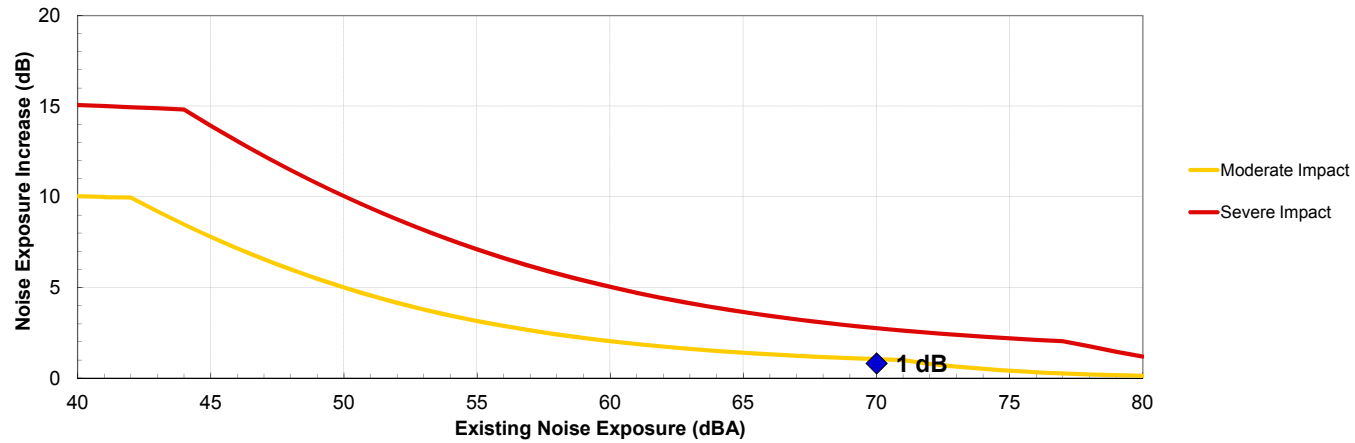
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

Time (Min)
Train Headway 5

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

Mobile Source Average Distance	
D1	7
D2	56
Average	31.5

Project

Project:	Airport Metro Connector
----------	-------------------------

Receiver Parameters	
Receiver:	Reciever 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	4

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	24
Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	6

Distance	Distance from Source to Receiver (ft)	570
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Bus Transit Center
Daytime hrs	Avg. Number of Buses/hr	58
Nighttime hrs	Avg. Number of Buses/hr	24
Distance	Distance from Source to Receiver (ft)	400
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 3
	Source Type:	Highway/Transit
	Specific Source:	Buses (hybrid)
Daytime hrs		
	Speed	10
	Avg. Number of Events/hr	9

Nighttime hrs		
	Speed	10
	Avg. Number of Events/hr	4
Distance	Distance from Source to Receiver (ft)	87
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 4
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	720
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	70 dBA
Total Project Ldn:	52 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

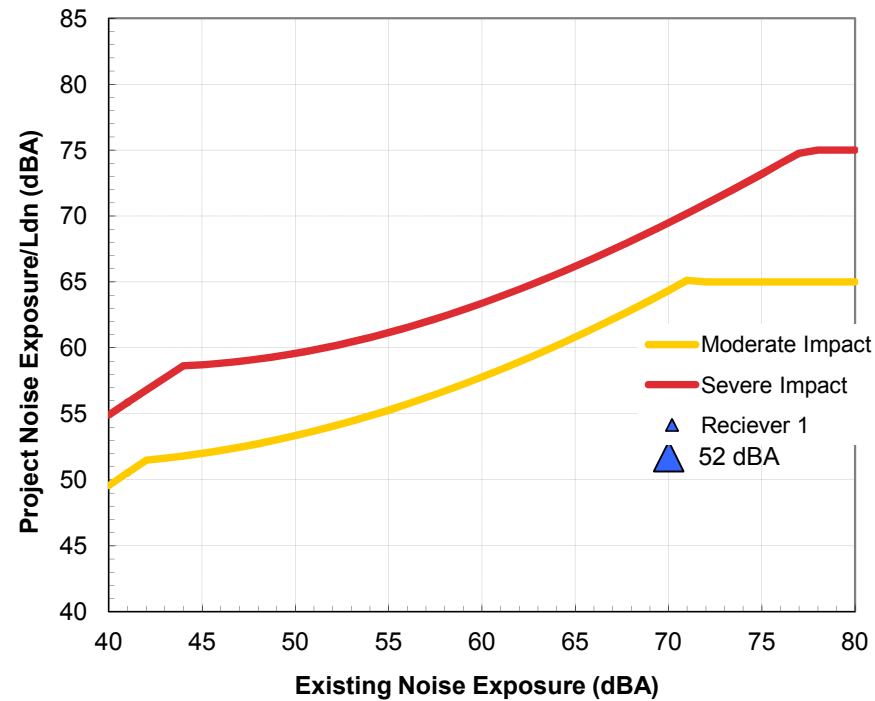
Distance to Impact Contours

Dist to Mod. Impact Contour:	---
Dist to Sev. Impact Contour:	---

Source 1 Results

Leq(day):	37.9 dBA
Leq(night):	31.9 dBA
Ldn:	39.9 dBA

Noise Impact Criteria (FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed (FTA Manual Fig 3-2)

Source 2 Results

Leq(day): 47.4 dBA

Leq(night): 43.6 dBA

Ldn: 50.8 dBA

Incremental Ldn (Src 1-2): 51.2 dBA

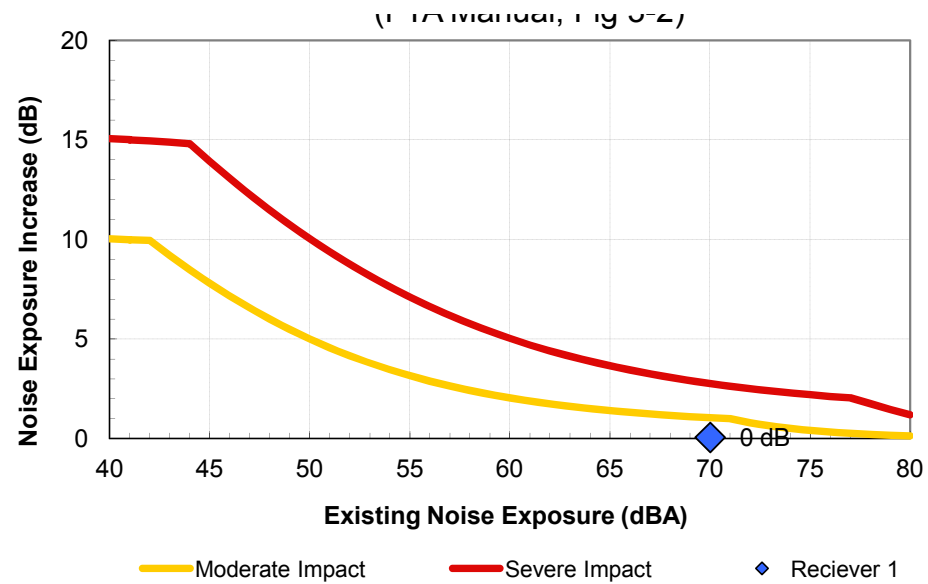
Source 3 Results

Leq(day): 38.7 dBA

Leq(night): 35.1 dBA

Ldn: 42.3 dBA

Incremental Ldn (Src 1-3): 51.7 dBA



Source 4 Results

Leq(day): 34.9 dBA

Leq(night): 25.2 dBA

Ldn: 35.0 dBA

Incremental Ldn (Src 1-4): 51.8 dBA

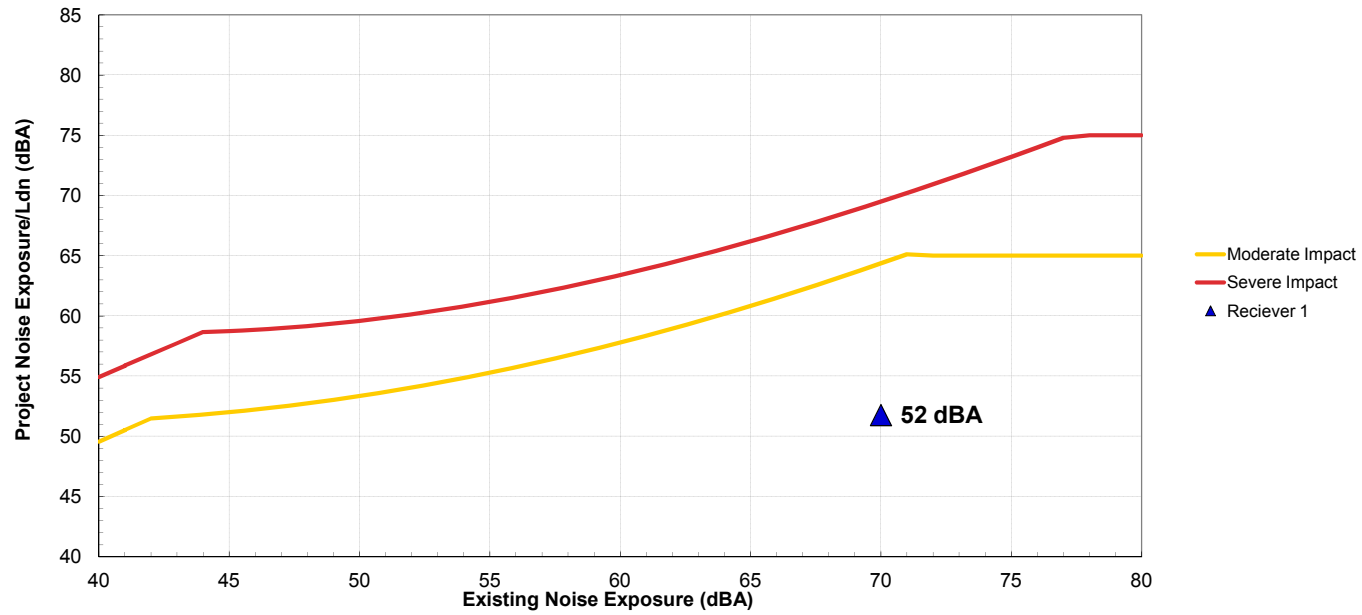
Project: Airport Metro Connector
Receiver: Receiver 1

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	570 ft	39.9 dBA	70 dBA
2 Bus Transit Center	400 ft	50.8 dBA	70 dBA
3 Buses (hybrid)	87 ft	42.3 dBA	70 dBA
4 Crossing Signals	720 ft	35.0 dBA	70 dBA
5 --	70 ft		70 dBA
6 --	ft		70 dBA
Combined Sources		52 dBA	70 dBA

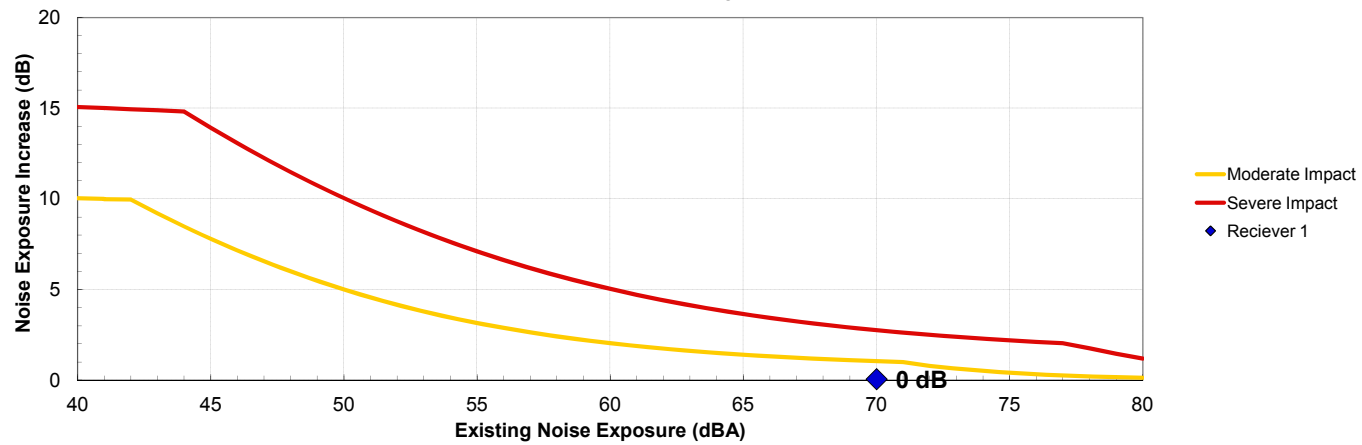
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

Time (Min)
Train Headway 5

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

Mobile Source Average Distance	
D1	64
D2	110
Average	87

Bus Trips From North (15% of total)

Total Trips	From North
58	8.7
24	3.6

Bus Trips From South

Total Trips	From South
58	49
24	20

Project:	Airport Metro Connector
----------	-------------------------

Receiver Parameters	
Receiver:	Reciever 2
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	4

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	24
Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	6

Distance	Distance from Source to Receiver (ft)	440
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Bus Transit Center
Daytime hrs	Avg. Number of Buses/hr	58
Nighttime hrs	Avg. Number of Buses/hr	24
Distance	Distance from Source to Receiver (ft)	325
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 3
	Source Type:	Highway/Transit
	Specific Source:	Buses (hybrid)
Daytime hrs		
	Speed	25
	Avg. Number of Events/hr	49

Nighttime hrs		
	Speed	25
	Avg. Number of Events/hr	20
Distance	Distance from Source to Receiver (ft)	83
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 4
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	918
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	70 dBA
Total Project Ldn:	59 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

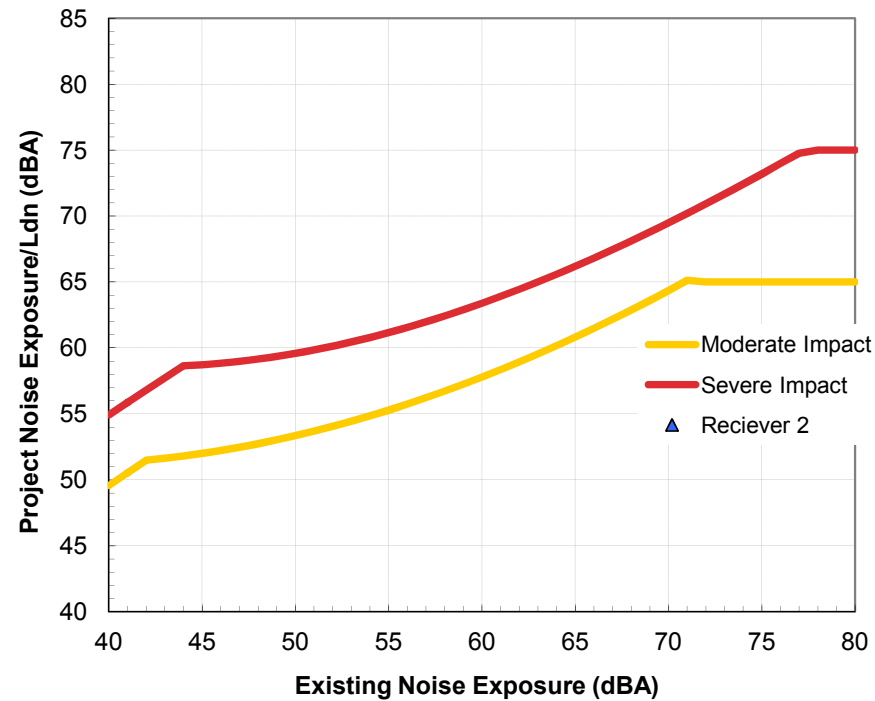
Distance to Impact Contours

Dist to Mod. Impact Contour:	---
Dist to Sev. Impact Contour:	---

Source 1 Results

Leq(day):	39.6 dBA
Leq(night):	33.6 dBA
Ldn:	41.5 dBA

Noise Impact Criteria (FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed (FTA Manual Fig 3-2)

Source 2 Results

Leq(day): 49.7 dBA

Leq(night): 45.9 dBA

Ldn: 53.1 dBA

Incremental Ldn (Src 1-2): 53.4 dBA

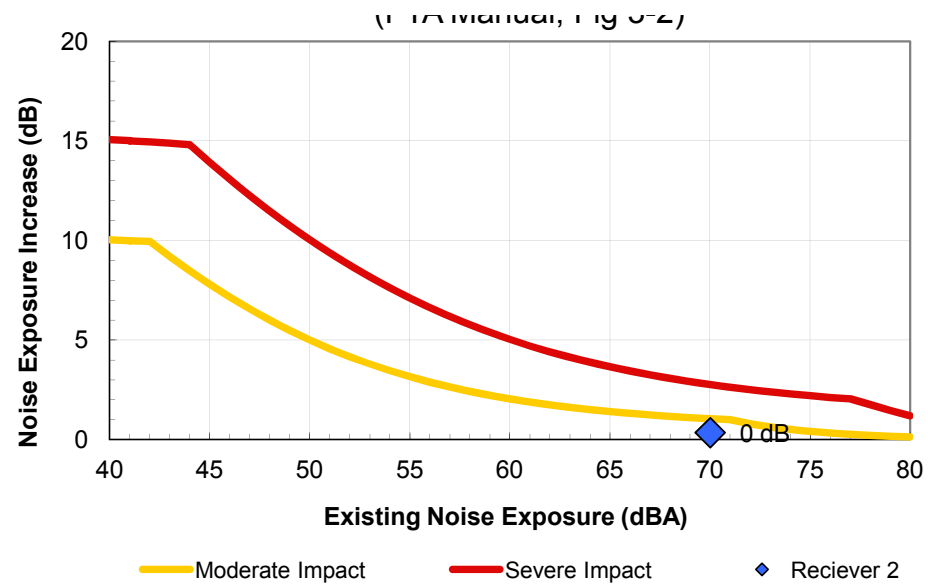
Source 3 Results

Leq(day): 54.7 dBA

Leq(night): 50.8 dBA

Ldn: 58.0 dBA

Incremental Ldn (Src 1-3): 59.3 dBA



Source 4 Results

Leq(day): 32.3 dBA

Leq(night): 22.5 dBA

Ldn: 32.4 dBA

Incremental Ldn (Src 1-4): 59.3 dBA

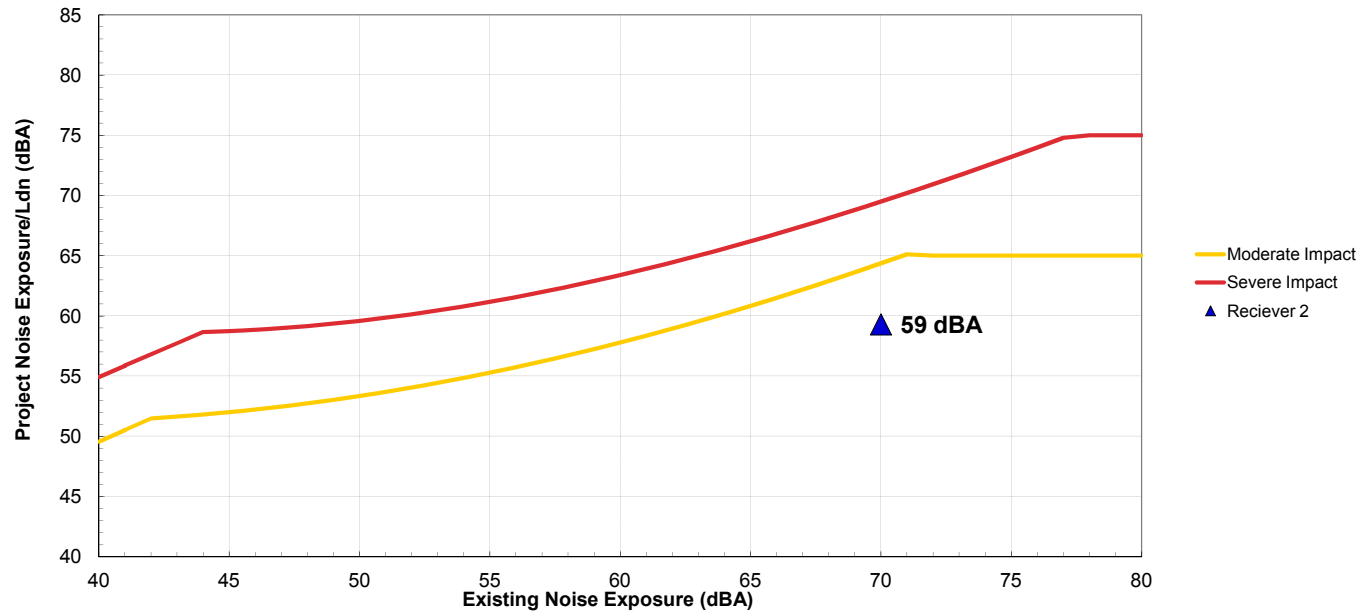
Project: Airport Metro Connector
Receiver: Receiver 2

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	440 ft	41.5 dBA	70 dBA
2 Bus Transit Center	325 ft	53.1 dBA	70 dBA
3 Buses (hybrid)	83 ft	58.0 dBA	70 dBA
4 Crossing Signals	918 ft	32.4 dBA	70 dBA
5 --	70 ft		70 dBA
6 --	ft		70 dBA
Combined Sources		59 dBA	70 dBA

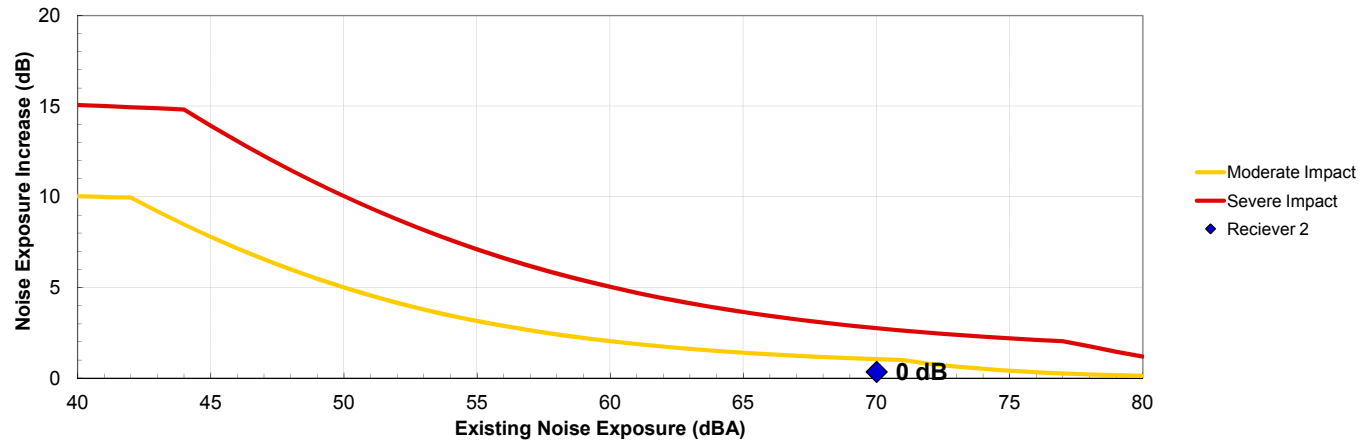
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

Time (Min)
Train Headway 5

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

Mobile Source Average Distance	
D1	60
D2	107
Average	83.5

Bus Trips From North (15% of total)

Total Trips	From North
58	8.7
24	3.6

Bus Trips From South

Total Trips	From South
58	49
24	20

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Project:	Airport Metro Connector
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Receiver Parameters	
Receiver:	Reciever 3
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	4

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	24

Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	240
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Bus Transit Center
Daytime hrs	Avg. Number of Buses/hr	58
Nighttime hrs	Avg. Number of Buses/hr	24
Distance	Distance from Source to Receiver (ft)	700
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 3
	Source Type:	Highway/Transit
	Specific Source:	Buses (hybrid)
Daytime hrs		
	Speed	30
	Avg. Number of Events/hr	49
Nighttime hrs		
	Speed	30
	Avg. Number of Events/hr	20
Distance	Distance from Source to Receiver (ft)	80
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 4
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	1350
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	70 dBA
Total Project Ldn:	60 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

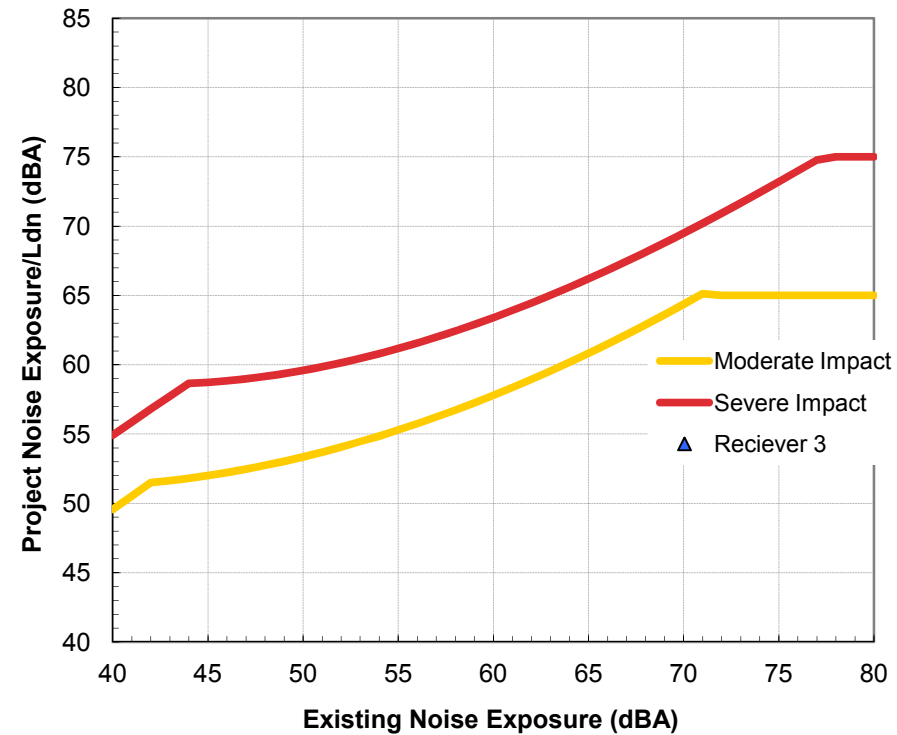
Distance to Impact Contours

Dist to Mod. Impact Contour:	---
Dist to Sev. Impact Contour:	---

Source 1 Results

Leq(day):	43.5 dBA
Leq(night):	37.5 dBA
Ldn:	45.5 dBA

Noise Impact Criteria (FTA Manual, Fig 3-1)



Source 2 Results

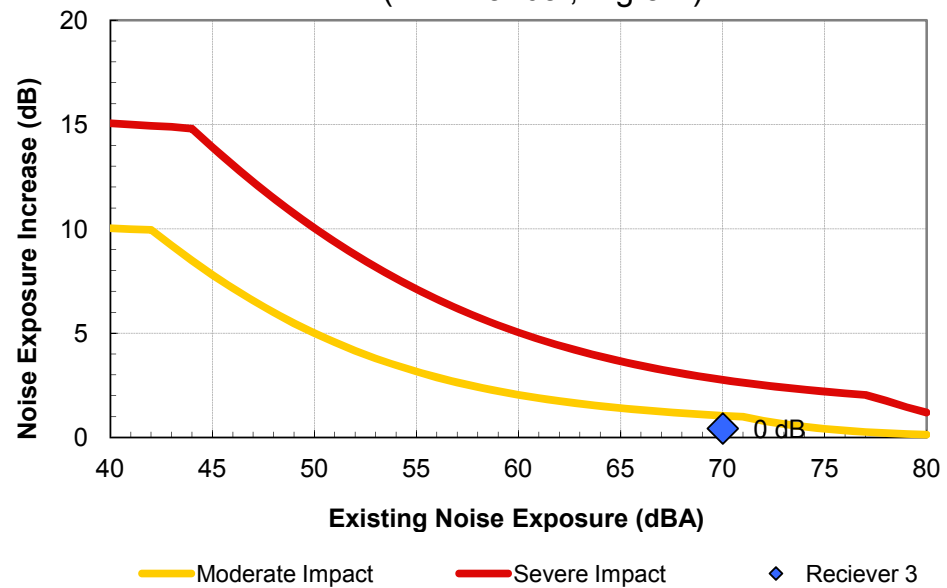
Leq(day): 41.4 dBA

Leq(night): 37.5 dBA

Ldn: 44.8 dBA

Incremental Ldn (Src 1-2): 48.1 dBA

Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Source 3 Results

Leq(day): 56.6 dBA

Leq(night): 52.7 dBA

Ldn: 59.9 dBA

Incremental Ldn (Src 1-3): 60.2 dBA

Source 4 Results

Leq(day): 28.1 dBA

Leq(night): 18.3 dBA

Ldn: 28.2 dBA

Incremental Ldn (Src 1-4): 60.2 dBA

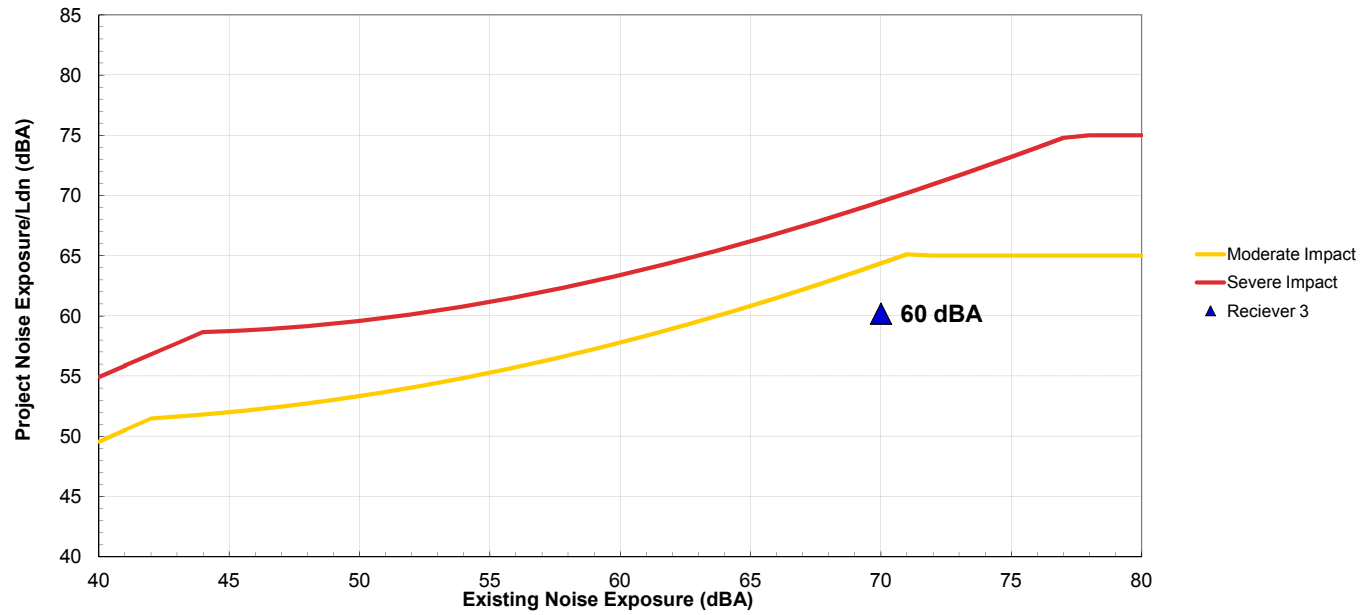
Project: Airport Metro Connector
Receiver: Receiver 3

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	240 ft	45.5 dBA	70 dBA
2 Bus Transit Center	700 ft	44.8 dBA	70 dBA
3 Buses (hybrid)	80 ft	59.9 dBA	70 dBA
4 Crossing Signals	1350 ft	28.2 dBA	70 dBA
5 --	70 ft		70 dBA
6 --	ft		70 dBA
Combined Sources		60 dBA	70 dBA

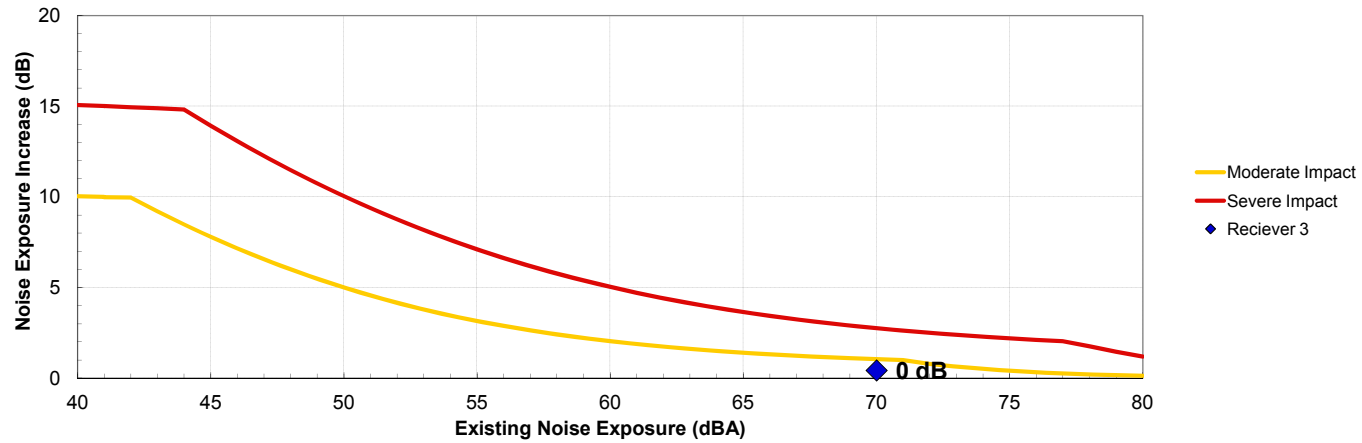
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

Train Headway Time (Min)
5

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

Mobile Source Average Distance	
D1	60
D2	100
Average	80

Bus Trips From North (15% of total)

Total Trips	From North
58	8.7
24	3.6

Bus Trips From South

Total Trips	From South
58	49
24	20

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Noise Impact Assessment Spreadsheet
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Project:	Airport Metro Connector
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Receiver Parameters	
Receiver:	Reciever 4 (Travelodge Hotel)
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	71 dBA

Noise Source Parameters	
Number of Noise Sources:	4

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	24

Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	123
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	Yes

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Bus Transit Center
Daytime hrs	Avg. Number of Buses/hr	58
Nighttime hrs	Avg. Number of Buses/hr	24
Distance	Distance from Source to Receiver (ft)	1280
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 3
	Source Type:	Highway/Transit
	Specific Source:	Buses (hybrid)
Daytime hrs		
	Speed	20
	Avg. Number of Events/hr	49
Nighttime hrs		
	Speed	20
	Avg. Number of Events/hr	20
Distance	Distance from Source to Receiver (ft)	31
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 4
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	1900
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	71 dBA
Total Project Ldn:	64 dBA
Total Noise Exposure:	72 dBA
Increase:	1 dB
Impact?:	None

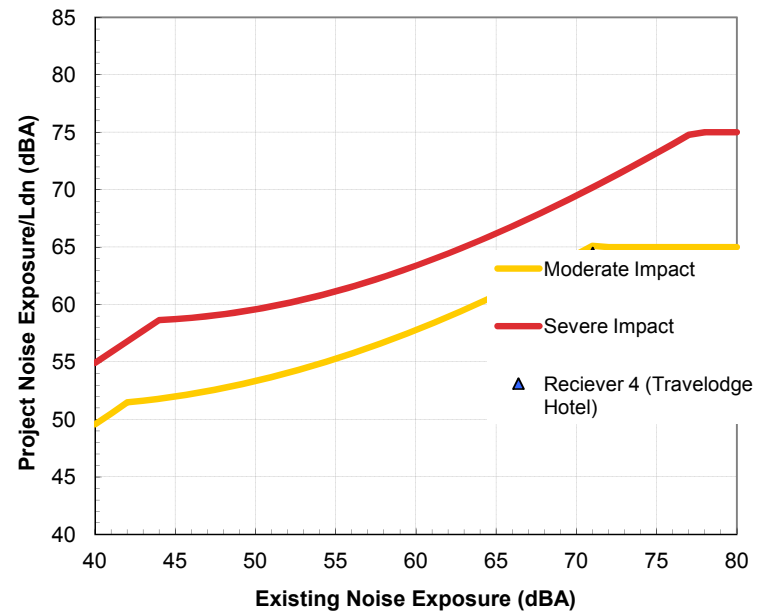
Distance to Impact Contours

Dist to Mod. Impact Contour:	---
Dist to Sev. Impact Contour:	---

Source 1 Results

Leq(day):	56.4 dBA
Leq(night):	50.4 dBA
Ldn:	58.3 dBA

Noise Impact Criteria (FTA Manual, Fig 3-1)



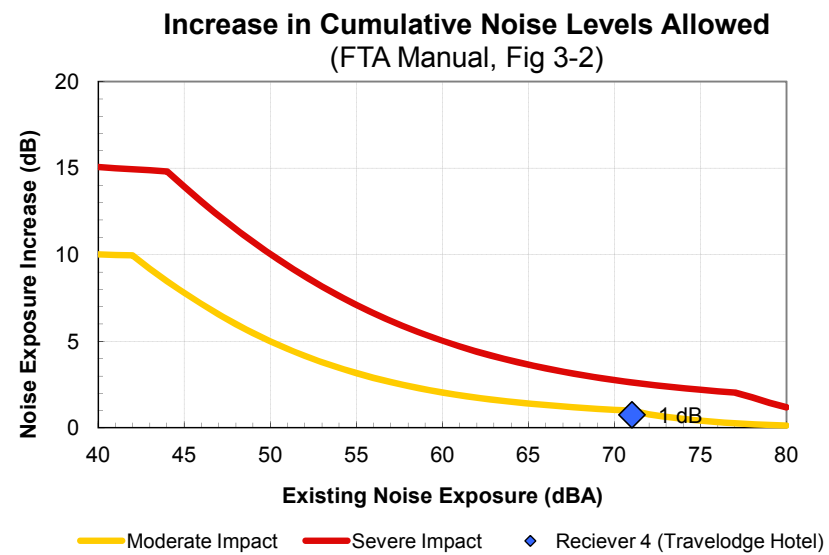
Source 2 Results

Leq(day): 34.8 dBA

Leq(night): 31.0 dBA

Ldn: 38.2 dBA

Incremental Ldn (Src 1-2): 58.4 dBA



Source 3 Results

Leq(day): 59.1 dBA

Leq(night): 55.2 dBA

Ldn: 62.4 dBA

Incremental Ldn (Src 1-3): 63.8 dBA

Source 4 Results

Leq(day): 24.4 dBA

Leq(night): 14.6 dBA

Ldn: 24.5 dBA

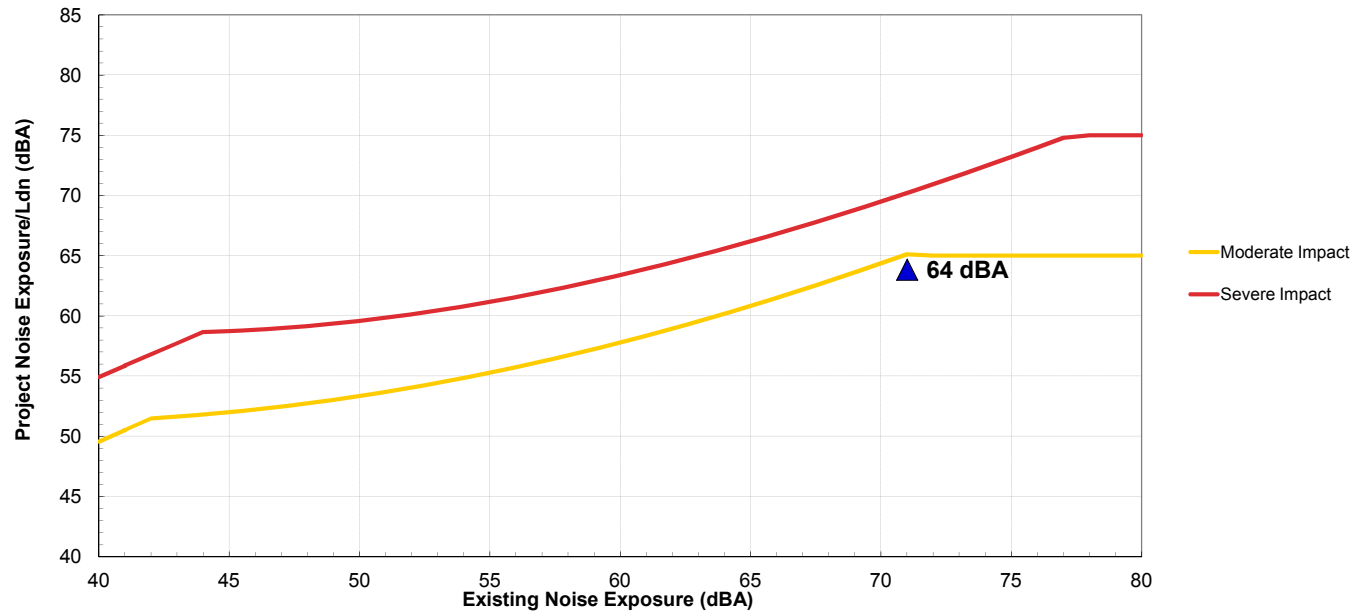
Incremental Ldn (Src 1-4): 63.8 dBA

Project: Airport Metro Connector
Receiver: Reciever 4 (Travelodge Hotel)

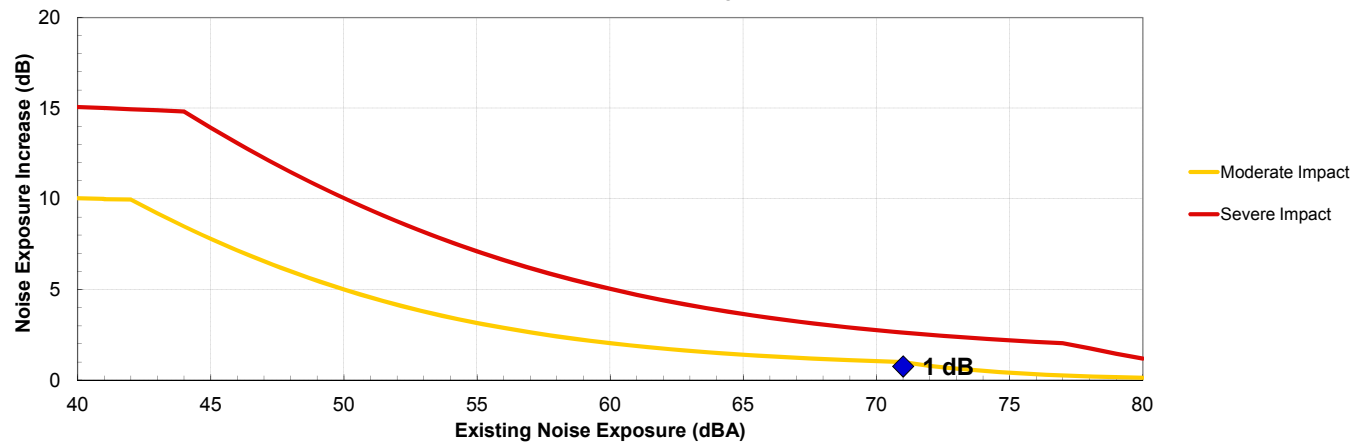
Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	123 ft	58.3 dBA	71 dBA
2 Bus Transit Center	1280 ft	38.2 dBA	71 dBA
3 Buses (hybrid)	31 ft	62.4 dBA	71 dBA
4 Crossing Signals	1900 ft	24.5 dBA	71 dBA
5 --	70 ft		71 dBA
6 --	ft		71 dBA
Combined Sources		64 dBA	71 dBA

Noise Criteria		
Mod. Impact	Sev. Impact	Impact?
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	
65 dBA	70 dBA	
65 dBA	70 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

Time (Min)
Train Headway 5

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

Mobile Source Average Distance	
D1	7
D2	56
Average	31.5

Bus Trips From North (15% of total)		
Total Trips	From North	
	58	8.7
	24	3.6
Bus Trips From South		
Total Trips	From South	
	58	49
	24	20

No Build Alternative

Project:	Airport Metro Connector
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Receiver Parameters	
Receiver:	Reciever 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	4

Noise Source Parameters		Source 1
Daytime hrs	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35
	Avg. Number of Events/hr	24

Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35
	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	570
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	720
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 3
	Source Type:	Stationary Source
	Specific Source:	Bus Transit Center
Daytime hrs	Avg. Number of Buses/hr	58
Nighttime hrs	Avg. Number of Buses/hr	24
Distance	Distance from Source to Receiver (ft)	1975
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 4
	Source Type:	Highway/Transit
	Specific Source:	Buses (hybrid)
Daytime hrs		
	Speed (mph)	40
	Avg. Number of Events/hr	8
Nighttime hrs		
	Speed (mph)	40
	Avg. Number of Events/hr	4
Distance	Distance from Source to Receiver (ft)	87
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	70 dBA
Total Project Ldn:	56 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

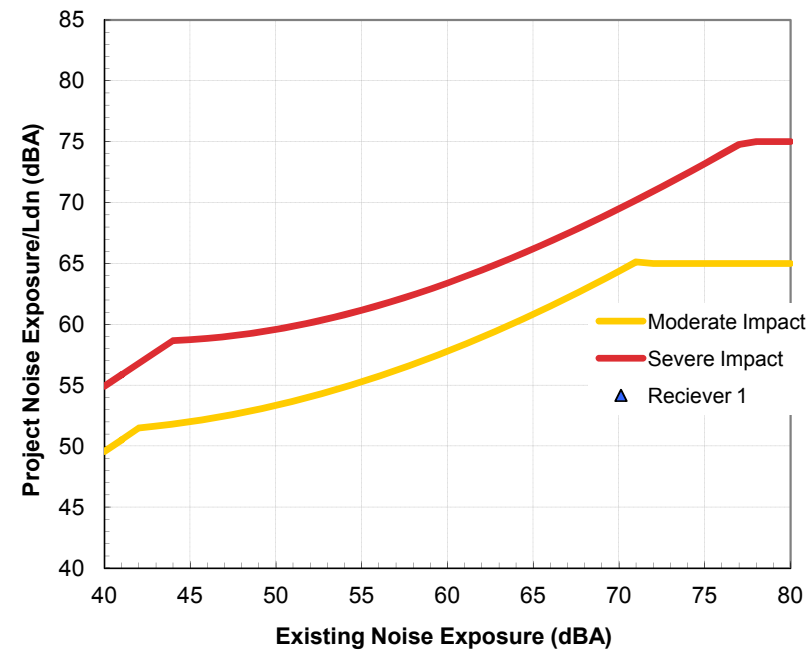
Distance to Impact Contours

Dist to Mod. Impact Contour:	---
Dist to Sev. Impact Contour:	---

Source 1 Results

Leq(day):	47.3 dBA
Leq(night):	41.3 dBA
Ldn:	49.2 dBA

Noise Impact Criteria (FTA Manual, Fig 3-1)



Source 2 Results

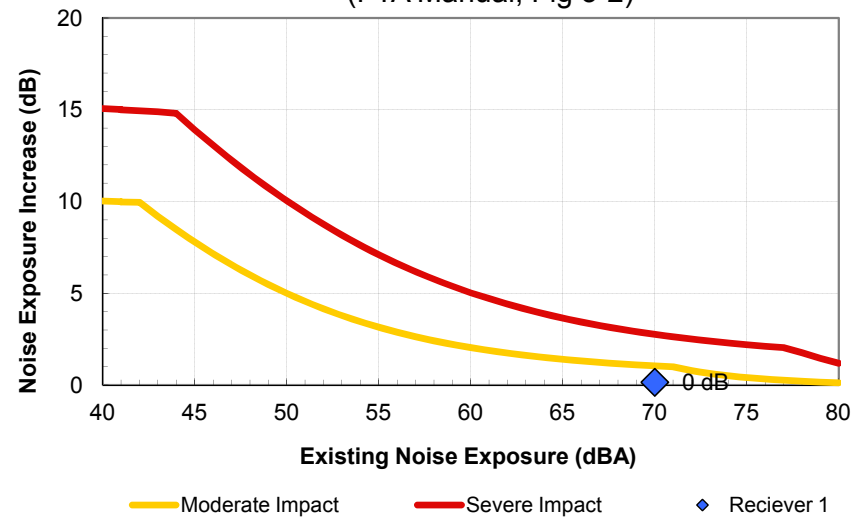
Leq(day): 34.9 dBA

Leq(night): 29.7 dBA

Ldn: 37.3 dBA

Incremental Ldn (Src 1-2): 49.5 dBA

Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Source 3 Results

Leq(day): 30.1 dBA

Leq(night): 21.8 dBA

Ldn: 30.8 dBA

Incremental Ldn (Src 1-3): 49.5 dBA

Source 4 Results

Leq(day): 50.8 dBA

Leq(night): 47.8 dBA

Ldn: 54.8 dBA

Incremental Ldn (Src 1-4): 55.9 dBA

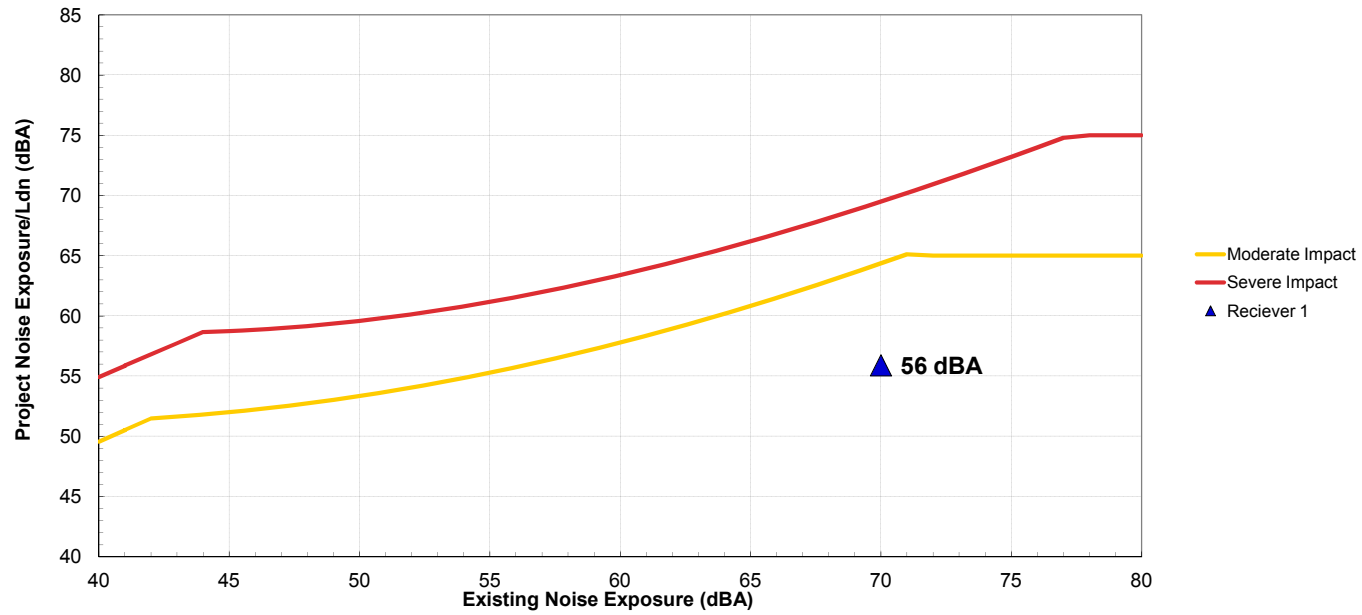
Project: Airport Metro Connector
Receiver: Receiver 1

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	570 ft	49.2 dBA	70 dBA
2 Crossing Signals	720 ft	37.3 dBA	70 dBA
3 Bus Transit Center	1975 ft	30.8 dBA	70 dBA
4 Buses (hybrid)	87 ft	54.8 dBA	70 dBA
5 --	ft		70 dBA
6 --	ft		70 dBA
Combined Sources		56 dBA	70 dBA

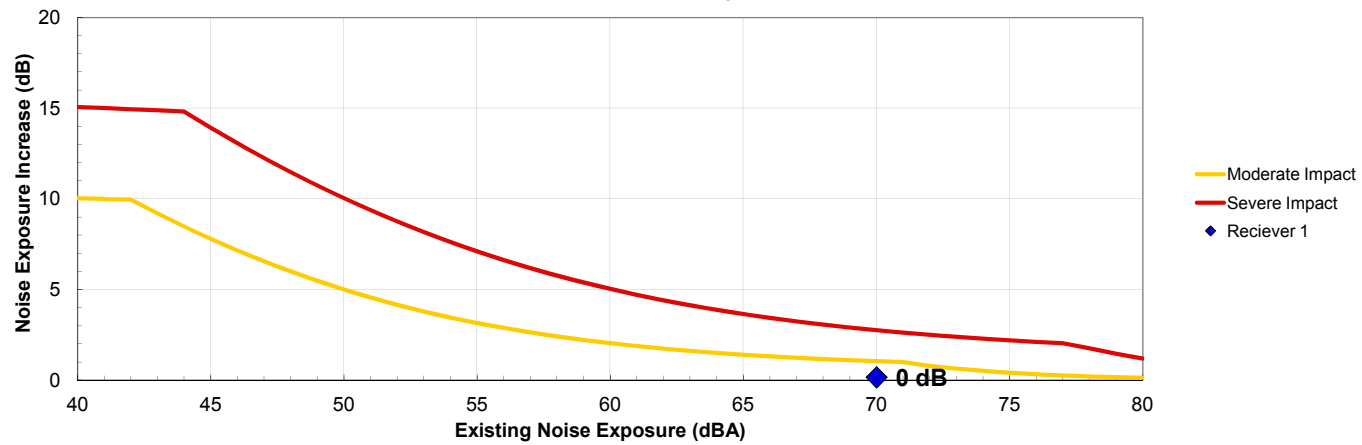
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

d1	64
d2	110
	87

Metro Busline 111 Daytime/Nighttime Trips	
Daytime	Trips
One Way Per Hour	4
Two Way Per Hour	8
Nighttime	Trips
One Way Per Hour	2
Two Way Per Hour	4

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Project:	Airport Metro Connector
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Receiver Parameters	
Receiver:	Reciever 2
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	4

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35
Daytime hrs	Avg. Number of Events/hr	24

Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35
	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	440
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	918
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 3
	Source Type:	Stationary Source
	Specific Source:	Bus Transit Center
Daytime hrs	Avg. Number of Buses/hr	58
Nighttime hrs	Avg. Number of Buses/hr	24
Distance	Distance from Source to Receiver (ft)	1565
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 4
	Source Type:	Highway/Transit
	Specific Source:	Buses (hybrid)
Daytime hrs		
	Speed (mph)	40
	Avg. Number of Events/hr	8
Nighttime hrs		
	Speed (mph)	40
	Avg. Number of Events/hr	4
Distance	Distance from Source to Receiver (ft)	83
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	70 dBA
Total Project Ldn:	57 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

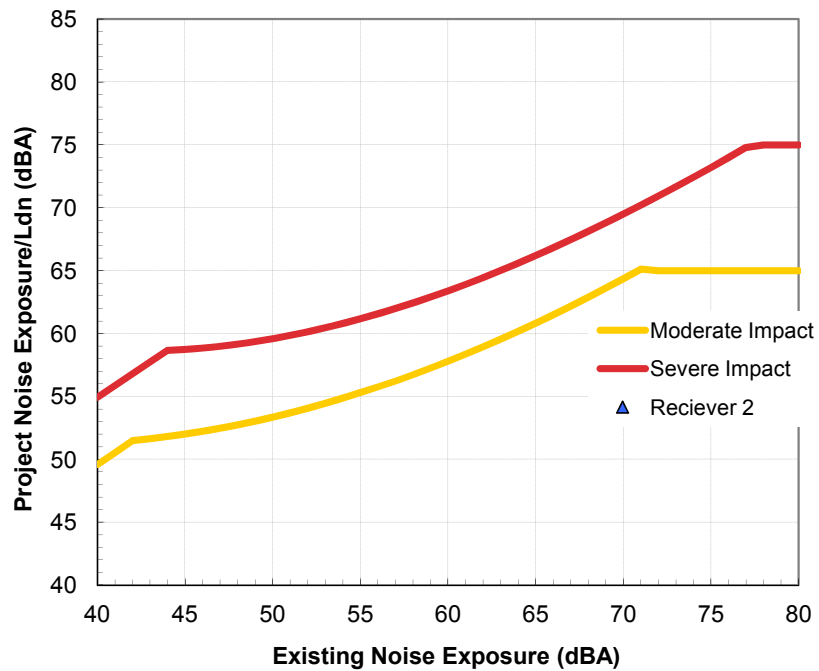
Distance to Impact Contours

Dist to Mod. Impact Contour:	---
Dist to Sev. Impact Contour:	---

Source 1 Results

Leq(day):	49.0 dBA
Leq(night):	42.9 dBA
Ldn:	50.9 dBA

Noise Impact Criteria (FTA Manual, Fig 3-1)



Source 2 Results

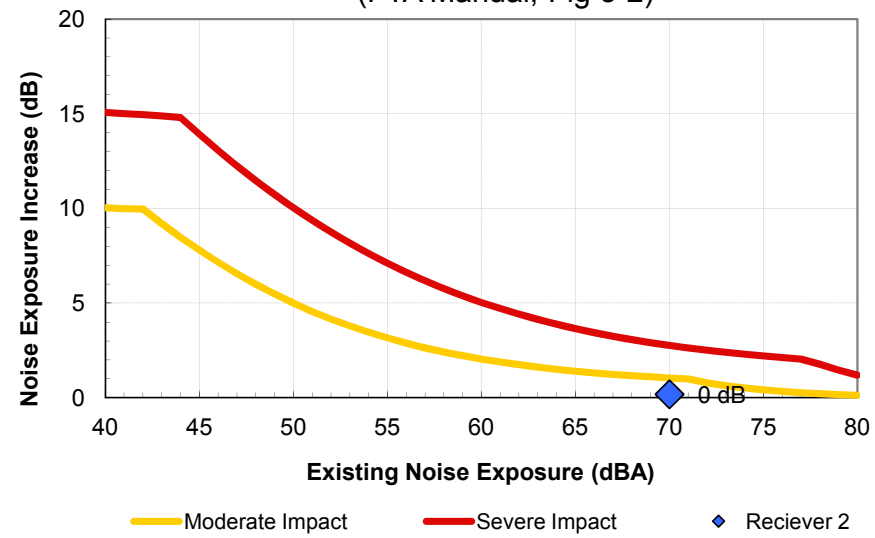
Leq(day): 32.3 dBA

Leq(night): 27.0 dBA

Ldn: 34.7 dBA

Incremental Ldn (Src 1-2): 51.0 dBA

Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Source 3 Results

Leq(day): 32.6 dBA

Leq(night): 24.3 dBA

Ldn: 33.3 dBA

Incremental Ldn (Src 1-3): 51.1 dBA

Source 4 Results

Leq(day): 51.1 dBA

Leq(night): 48.1 dBA

Ldn: 55.1 dBA

Incremental Ldn (Src 1-4): 56.5 dBA

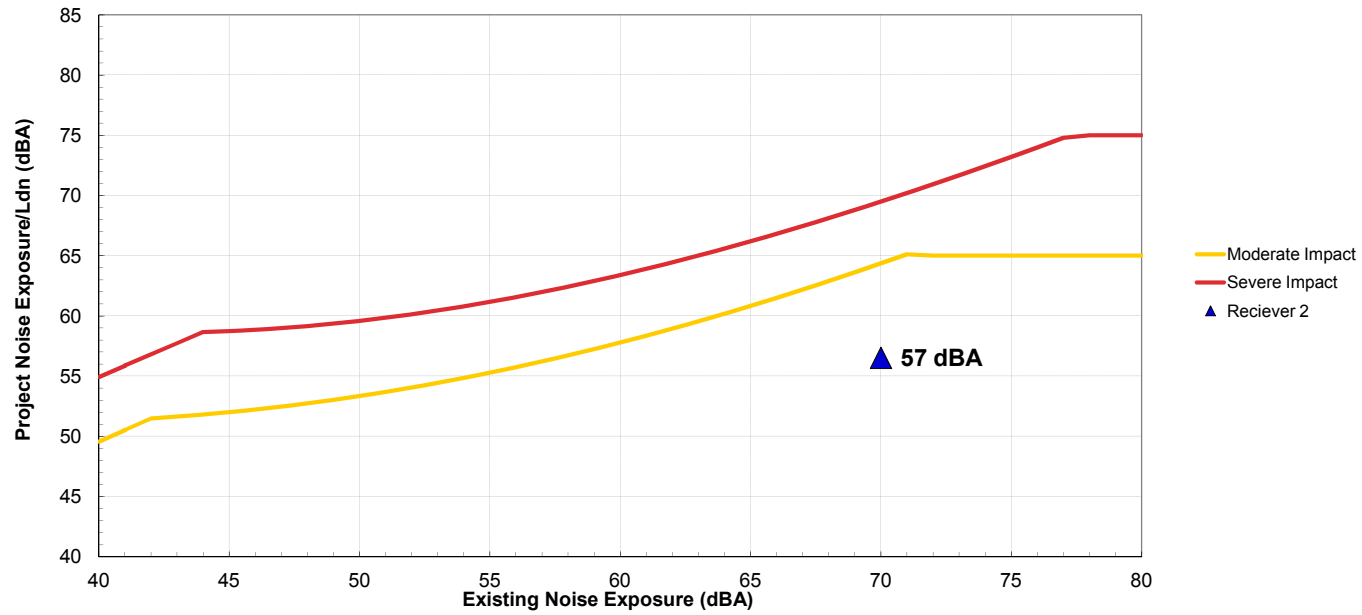
Project: Airport Metro Connector
Receiver: Receiver 2

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	440 ft	50.9 dBA	70 dBA
2 Crossing Signals	918 ft	34.7 dBA	70 dBA
3 Bus Transit Center	1565 ft	33.3 dBA	70 dBA
4 Buses (hybrid)	83 ft	55.1 dBA	70 dBA
5 --	ft		70 dBA
6 --	ft		70 dBA
Combined Sources		57 dBA	70 dBA

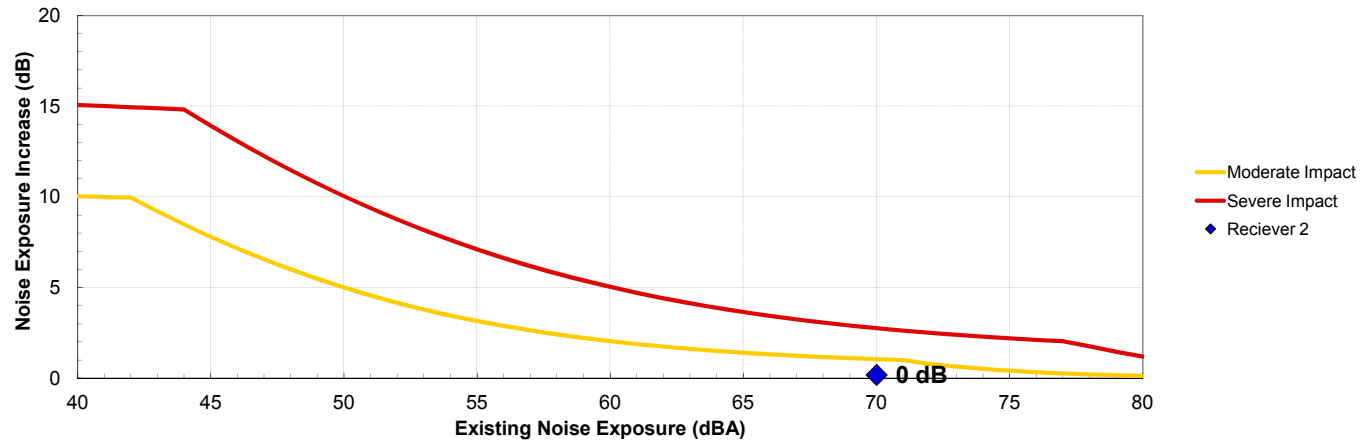
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

Time (Min)
Train Headway 5

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

Mobile Source Average Distance	
D1	60
D2	107
Average	83.5

Metro Busline 111 Daytime/Nighttime Trips	
Daytime	Trips
One Way Per Hour	4
Two Way Per Hour	8
Nighttime	Trips
One Way Per Hour	2
Two Way Per Hour	4

Federal Transit Administration
Noise Impact Assessment Spreadsheet
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version: 7/3/2007

Project:	Airport Metro Connector
----------	-------------------------

Receiver Parameters	
Receiver:	Reciever 3
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	70 dBA

Noise Source Parameters	
Number of Noise Sources:	4

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35
Daytime hrs	Avg. Number of Events/hr	24

Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	35
	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	240
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	1350
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 3
	Source Type:	Stationary Source
	Specific Source:	Bus Transit Center
Daytime hrs	Avg. Number of Buses/hr	58
Nighttime hrs	Avg. Number of Buses/hr	24
Distance	Distance from Source to Receiver (ft)	1000
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 4
	Source Type:	Highway/Transit
	Specific Source:	Buses (hybrid)
Daytime hrs		
	Speed (mph)	40
	Avg. Number of Events/hr	8
Nighttime hrs		
	Speed (mph)	40
	Avg. Number of Events/hr	4
Distance	Distance from Source to Receiver (ft)	80
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	70 dBA
Total Project Ldn:	58 dBA
Total Noise Exposure:	70 dBA
Increase:	0 dB
Impact?:	None

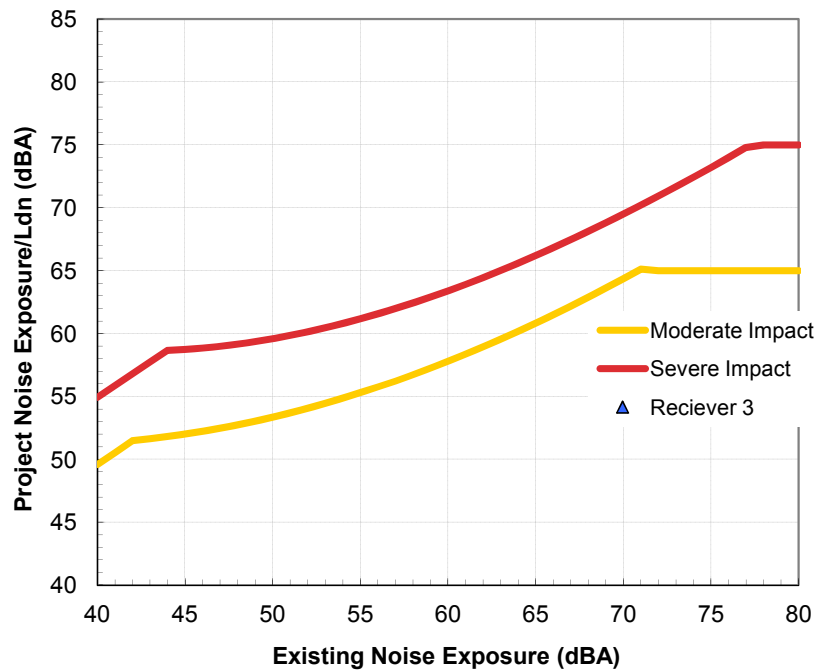
Distance to Impact Contours

Dist to Mod. Impact Contour:	---
Dist to Sev. Impact Contour:	---

Source 1 Results

Leq(day):	52.9 dBA
Leq(night):	46.9 dBA
Ldn:	54.8 dBA

Noise Impact Criteria (FTA Manual, Fig 3-1)



Source 2 Results

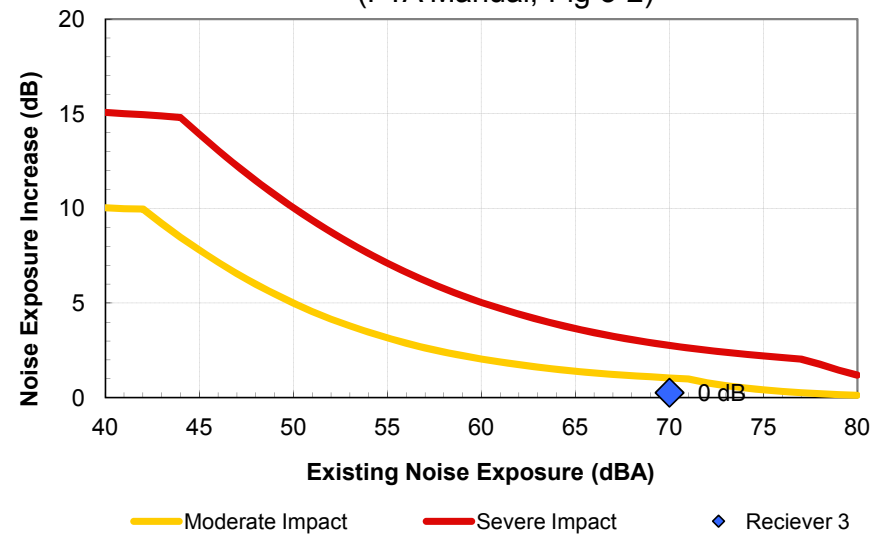
Leq(day): 28.1 dBA

Leq(night): 22.8 dBA

Ldn: 30.5 dBA

Incremental Ldn (Src 1-2): 54.9 dBA

Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Source 3 Results

Leq(day): 37.5 dBA

Leq(night): 29.2 dBA

Ldn: 38.2 dBA

Incremental Ldn (Src 1-3): 55.0 dBA

Source 4 Results

Leq(day): 51.3 dBA

Leq(night): 48.3 dBA

Ldn: 55.3 dBA

Incremental Ldn (Src 1-4): 58.1 dBA

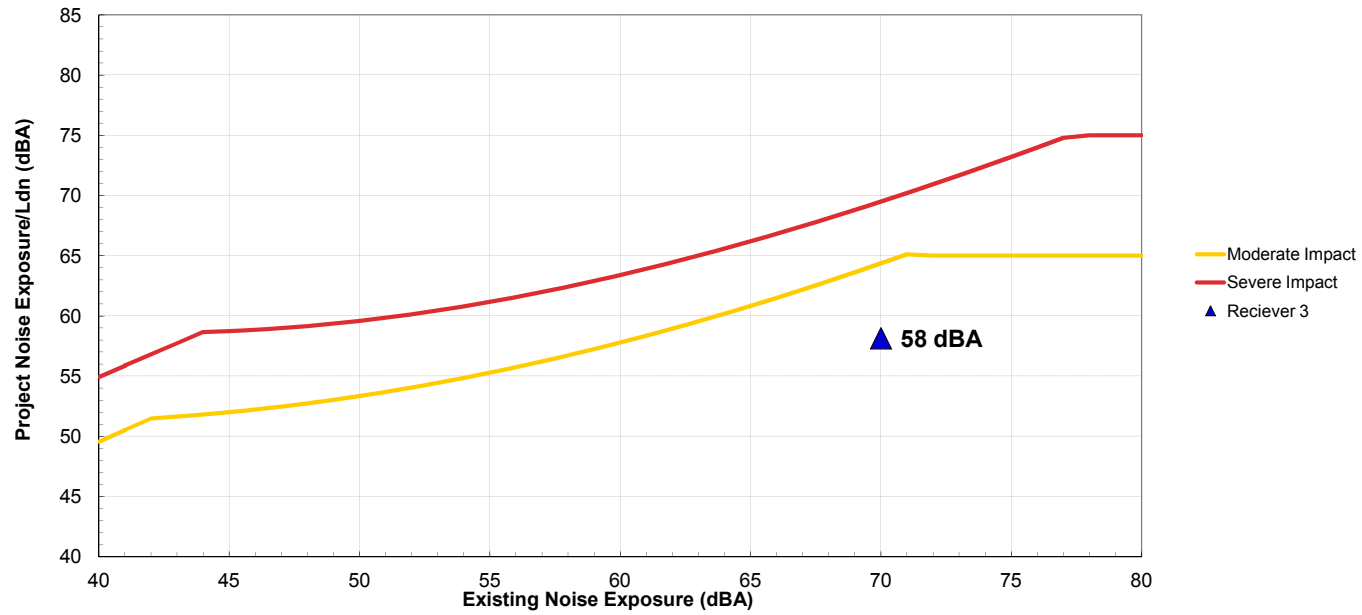
Project: Airport Metro Connector
Receiver: Receiver 3

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	240 ft	54.8 dBA	70 dBA
2 Crossing Signals	1350 ft	30.5 dBA	70 dBA
3 Bus Transit Center	1000 ft	38.2 dBA	70 dBA
4 Buses (hybrid)	80 ft	55.3 dBA	70 dBA
5 --	ft		70 dBA
6 --	ft		70 dBA
Combined Sources		58 dBA	70 dBA

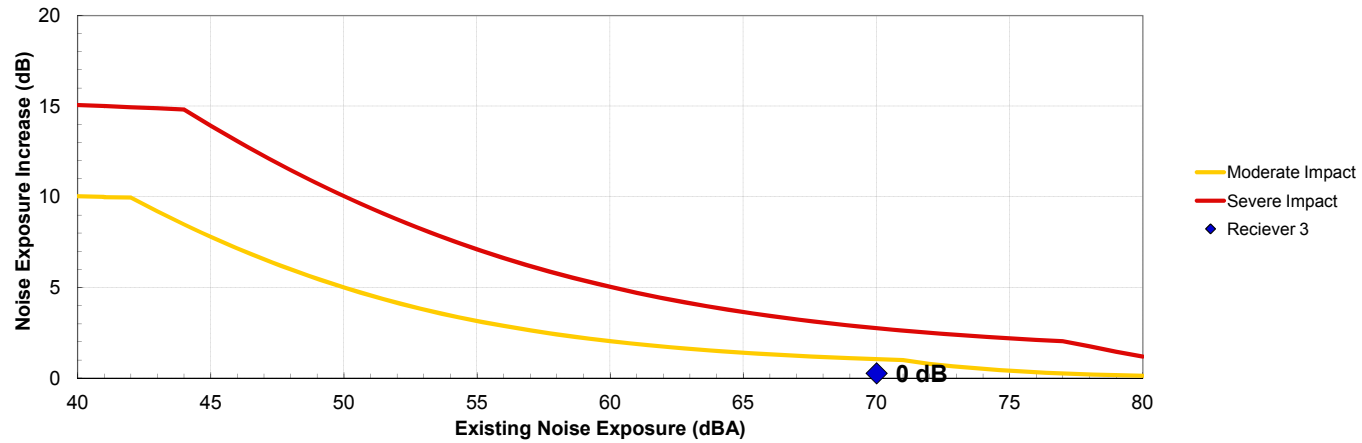
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	None
64 dBA	69 dBA	
64 dBA	69 dBA	
64 dBA	69 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

Time (Min)
Train Headway 5

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

Mobile Source Average Distance	
D1	60
D2	100
Average	80

Metro Busline 111 Daytime/Nighttime Trips	
Daytime	Trips
One Way Per Hour	4
Two Way Per Hour	8
Nighttime	Trips
One Way Per Hour	2
Two Way Per Hour	4

Project:	Airport Metro Connector
----------	-------------------------

Receiver Parameters	
Receiver:	Reciever 4 (Travelodge Hotel)
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	71 dBA

Noise Source Parameters	
Number of Noise Sources:	4

Noise Source Parameters		Source 1
Daytime hrs	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	24

Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	123
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	Yes

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	1900
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 3
	Source Type:	Stationary Source
	Specific Source:	Bus Transit Center
Daytime hrs	Avg. Number of Buses/hr	58
Nighttime hrs	Avg. Number of Buses/hr	24
Distance	Distance from Source to Receiver (ft)	500
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 4
	Source Type:	Highway/Transit
	Specific Source:	Buses (hybrid)
Daytime hrs	Speed (mph)	20
	Avg. Number of Events/hr	8
Nighttime hrs	Speed (mph)	20
	Avg. Number of Events/hr	4
Distance	Distance from Source to Receiver (ft)	31
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	71 dBA
Total Project Ldn:	60 dBA
Total Noise Exposure:	71 dBA
Increase:	0 dB
Impact?:	None

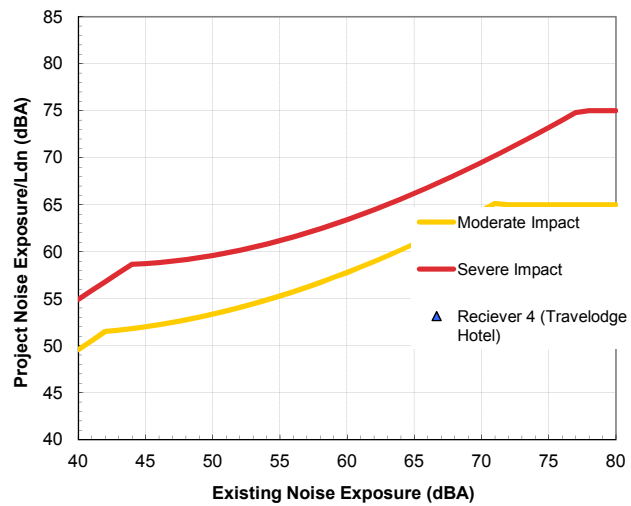
Distance to Impact Contours

Dist to Mod. Impact Contour:	----
Dist to Sev. Impact Contour:	----

Source 1 Results

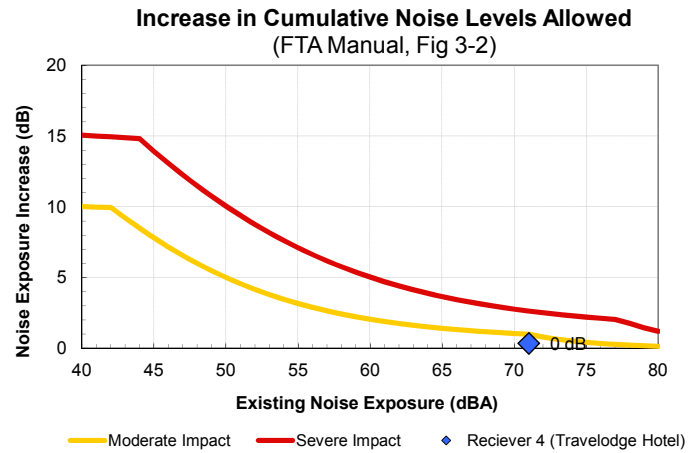
Leq(day):	56.4 dBA
Leq(night):	50.4 dBA
Ldn:	58.3 dBA

Noise Impact Criteria (FTA Manual, Fig 3-1)



Source 2 Results

Leq(day): 24.4 dBA
Leq(night): 19.1 dBA
Ldn: 26.8 dBA
Incremental Ldn (Src 1-2): 58.3 dBA



Source 3 Results

Leq(day): 45.0 dBA
Leq(night): 36.7 dBA
Ldn: 45.7 dBA
Incremental Ldn (Src 1-3): 58.6 dBA

Source 4 Results

Leq(day): 51.2 dBA
Leq(night): 48.2 dBA
Ldn: 55.2 dBA
Incremental Ldn (Src 1-4): 60.2 dBA

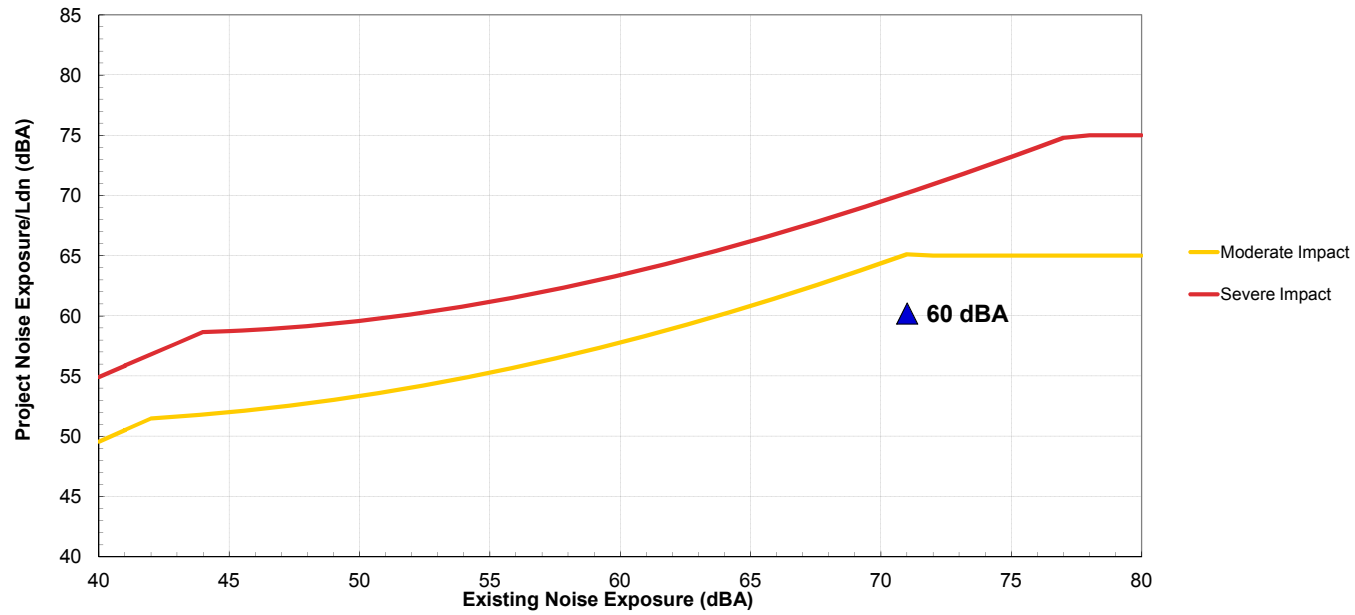
Project: Airport Metro Connector
Receiver: Reciever 4 (Travelodge Hotel)

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	123 ft	58.3 dBA	71 dBA
2 Crossing Signals	1900 ft	26.8 dBA	71 dBA
3 Bus Transit Center	500 ft	45.7 dBA	71 dBA
4 Buses (hybrid)	31 ft	55.2 dBA	71 dBA
5 --	ft		71 dBA
6 --	ft		71 dBA
Combined Sources		60 dBA	71 dBA

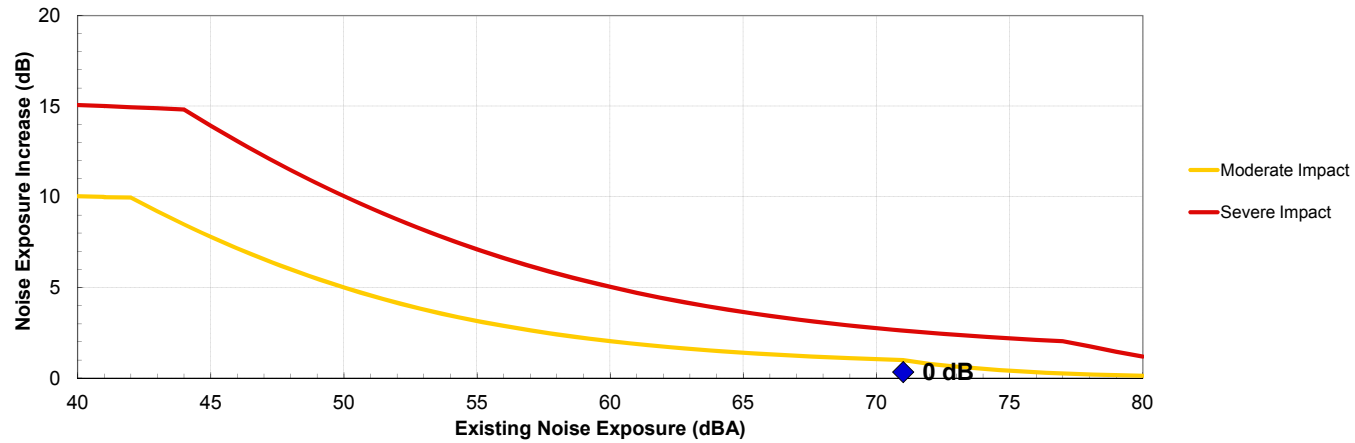
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	
65 dBA	70 dBA	
65 dBA	70 dBA	None

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Cumulative Build

Federal Transit Administration
Noise Impact Assessment Spreadsheet
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version: 7/3/2007

Project:	Airport Metro Connector
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Receiver Parameters	
Receiver:	Reciever 4 (Travelodge Hotel)
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	71 dBA

Noise Source Parameters	
Number of Noise Sources:	6

Noise Source Parameters		Source 1
Daytime hrs	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	24

Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	123
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	Yes

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Bus Transit Center
Daytime hrs	Avg. Number of Buses/hr	58
Nighttime hrs	Avg. Number of Buses/hr	24
Distance	Distance from Source to Receiver (ft)	1280
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 3
	Source Type:	Highway/Transit
	Specific Source:	Buses (hybrid)
Daytime hrs		
	Speed	20
	Avg. Number of Events/hr	49
Nighttime hrs		
	Speed	20
	Avg. Number of Events/hr	20
Distance	Distance from Source to Receiver (ft)	31
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 4
	Source Type:	Stationary Source
	Specific Source:	Crossing Signals
Daytime hrs	Signal Duration/hr (seconds)	400
Nighttime hrs	Signal Duration/hr (seconds)	120
Distance	Distance from Source to Receiver (ft)	1900
	Number of Intervening Rows of Buildings	1
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 5
	Source Type:	Fixed Guideway
	Specific Source:	Automated Guideway Transit /Steel Wheel
Daytime hrs	Avg. Number of vehicles/train	5
	Speed (mph)	20
	Avg. Number of Events/hr	30
Nighttime hrs	Avg. Number of vehicles/train	5
	Speed (mph)	20
	Avg. Number of Events/hr	9
Distance	Distance from Source to Receiver (ft)	820
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 6
	Source Type:	Highway/Transit
	Specific Source:	Automobiles and Vans
Daytime hrs		
	Speed	40
	Avg. Number of Events/hr	399
Nighttime hrs		
	Speed	40
	Avg. Number of Events/hr	163
Distance	Distance from Source to Receiver (ft)	31
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	71 dBA
Total Project Ldn:	66 dBA
Total Noise Exposure:	72 dBA
Increase:	1 dB
Impact?:	Moderate

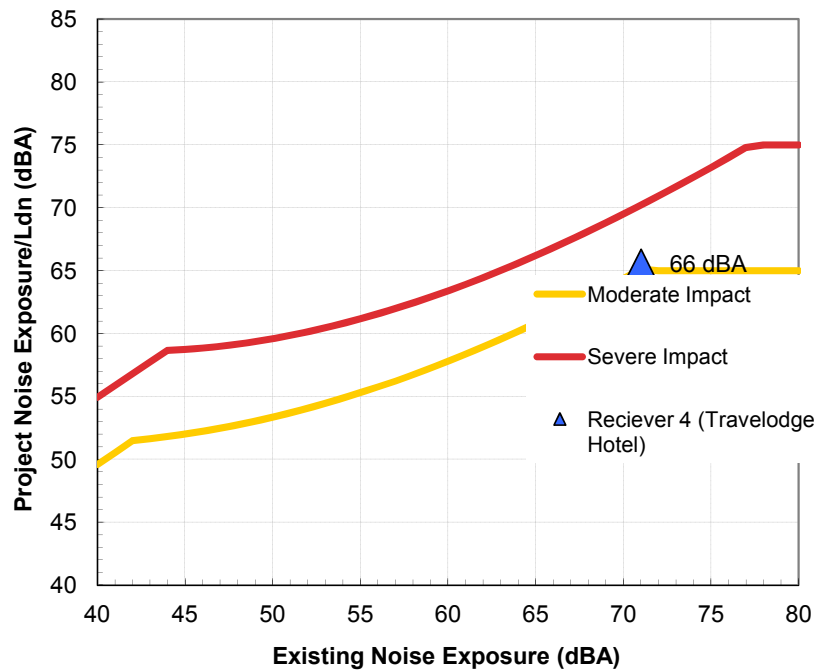
Distance to Impact Contours

Dist to Mod. Impact Contour:	---
Dist to Sev. Impact Contour:	---

Source 1 Results

Leq(day):	56.4 dBA
Leq(night):	50.4 dBA
Ldn:	58.3 dBA

Noise Impact Criteria (FTA Manual, Fig 3-1)



Source 2 Results

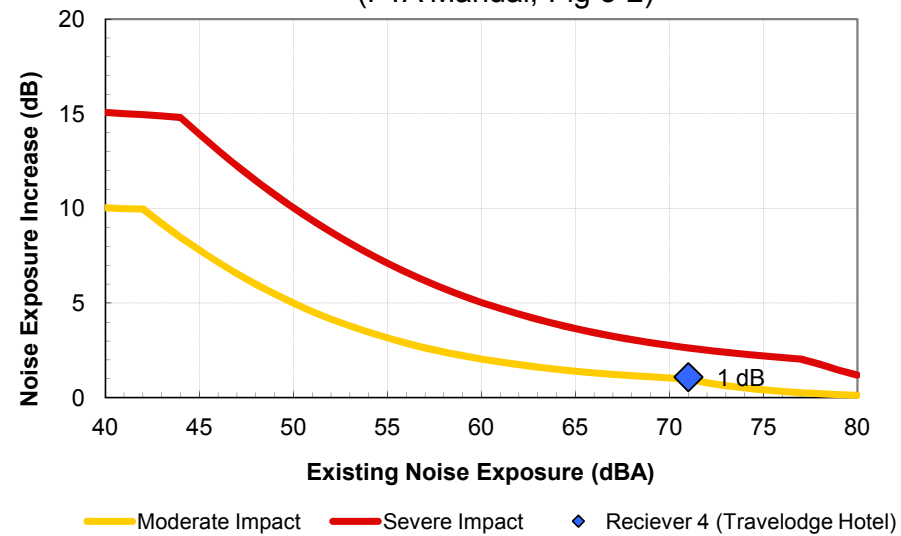
Leq(day): 34.8 dBA

Leq(night): 31.0 dBA

Ldn: 38.2 dBA

Incremental Ldn (Src 1-2): 58.4 dBA

Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Source 3 Results

Leq(day): 59.1 dBA

Leq(night): 55.2 dBA

Ldn: 62.4 dBA

Incremental Ldn (Src 1-3): 63.8 dBA

Source 4 Results

Leq(day): 24.4 dBA

Leq(night): 14.6 dBA

Ldn: 24.5 dBA

Incremental Ldn (Src 1-4): 63.8 dBA

Source 5 Results

Leq(day): 38.0 dBA

Leq(night): 32.8 dBA

Ldn: 40.4 dBA

Incremental Ldn (Src 1-5): 63.9 dBA

Source 6 Results

Leq(day): 64.6 dBA

Leq(night): 60.7 dBA

Ldn: 68.0 dBA

Incremental Ldn (Src 1-6): 69.4 dBA

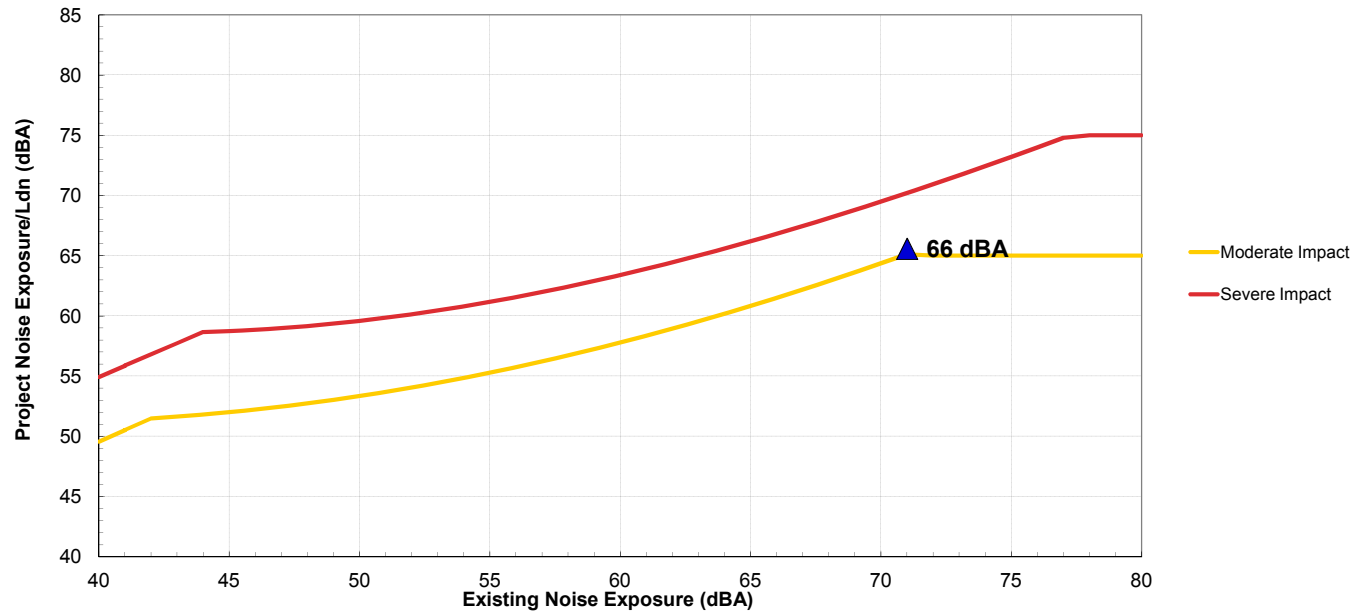
Project: Airport Metro Connector
Receiver: Reciever 4 (Travelodge Hotel)

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	123 ft	58.3 dBA	71 dBA
2 Bus Transit Center	1280 ft	38.2 dBA	71 dBA
3 Buses (hybrid)	31 ft	62.4 dBA	71 dBA
4 Crossing Signals	1900 ft	24.5 dBA	71 dBA
5 Automated Guideway Transi	820 ft	40.4 dBA	71 dBA
6 Automobiles and Vans	31 ft	68.0 dBA	71 dBA
Combined Sources		66 dBA	71 dBA

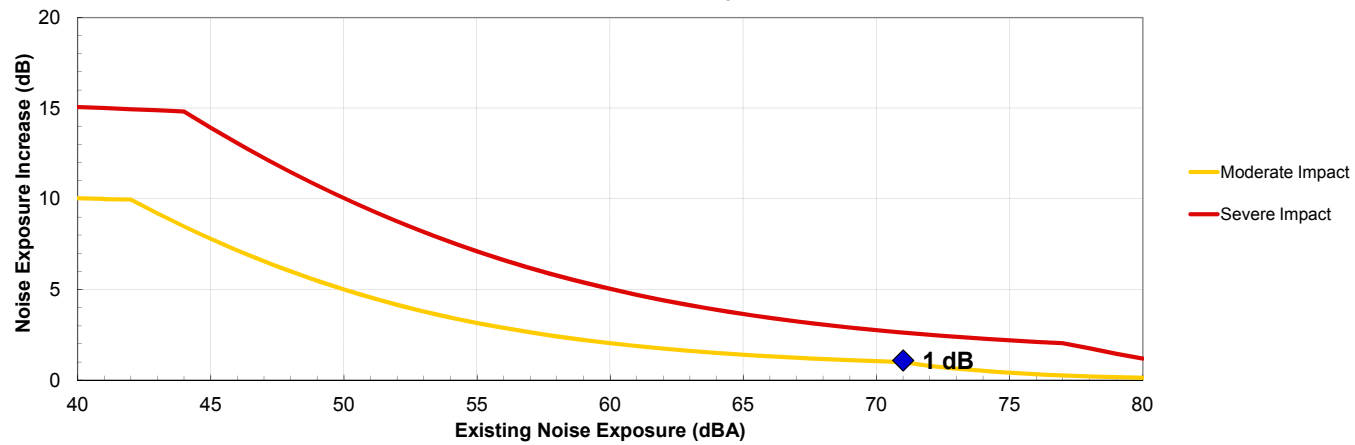
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	Moderate Impact
65 dBA	70 dBA	Moderate Impact

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

Train Headway Time (Min)
5

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

Mobile Source Average Distance	
D1	7
D2	56
Average	31.5

Daytime Bus Ratio 0.71
Nighttime Bus Ratio 0.29

Bus Trips From North (15% of total)
Total Trips From North
58 8.7
24 3.6

Bus Trips From South
Total Trips From South
58 49
24 20

Cumulative Mobile Trips Calculation

Am North	1406
Am South	1111
Average AM	1258.5
Pm North	1403
Pm South	1406
Average PM	1404.5
 Average	 1332
Daytime	945
Nighttime	386

Existing Mobile Trips Calculation

Am North	856
Am South	631
Average Am	743.5
Pm North	732
Pm South	858
Average Pm	795
 Average	 769
Daytime	546
Nighttime	223

Cumulative vs Existing Mobile Trips

Daytime (Cumulative - existing)	399
Nighttime (Cumulative - existing)	163

Cumulative No Build

Project:	Airport Metro Connector
----------	-------------------------

Receiver Parameters	
Receiver:	Reciever 4 (Travelodge Hotel)
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	71 dBA

Noise Source Parameters	
Number of Noise Sources:	6

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	24

Nighttime hrs	Avg. Number of Transit Vehicles/train	4
	Speed (mph)	20
	Avg. Number of Events/hr	6
Distance	Distance from Source to Receiver (ft)	123
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	Yes

Noise Source Parameters		Source 2
	Source Type:	Stationary Source
	Specific Source:	Parking Garage
Daytime hrs	Avg. Number of Autos/hr	270
Nighttime hrs	Avg. Number of Autos/hr	110
Distance	Distance from Source to Receiver (ft)	260
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 3
	Source Type:	Highway/Transit
	Specific Source:	Buses (hybrid)
Daytime hrs		
	Speed	20
	Avg. Number of Events/hr	8
Nighttime hrs		
	Speed	20
	Avg. Number of Events/hr	4
Distance	Distance from Source to Receiver (ft)	31
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 4
	Source Type:	Highway/Transit
	Specific Source:	Automobiles and Vans
Daytime hrs		
	Speed (mph)	40
	Avg. Number of Events/hr	390
Nighttime hrs		
	Speed (mph)	20
	Avg. Number of Events/hr	159
Distance	Distance from Source to Receiver (ft)	31
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 5
	Source Type:	Highway/Transit
	Specific Source:	Automobiles and Vans
Daytime hrs		
	Speed (mph)	40
	Avg. Number of Events/hr	270
Nighttime hrs		
	Speed (mph)	40
	Avg. Number of Events/hr	110
Distance	Distance from Source to Receiver (ft)	170
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Noise Source Parameters		Source 6
	Source Type:	Fixed Guideway
	Specific Source:	Automated Guideway Transit /Steel Wheel
Daytime hrs	Avg. Number of vehicles/train	5
	Speed	20
	Avg. Number of Events/hr	30
Nighttime hrs	Avg. Number of vehicles/train	5
	Speed	20
	Avg. Number of Events/hr	9
Distance	Distance from Source to Receiver (ft)	820
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	71 dBA
Total Project Ldn:	66 dBA
Total Noise Exposure:	72 dBA
Increase:	1 dB
Impact?:	Moderate

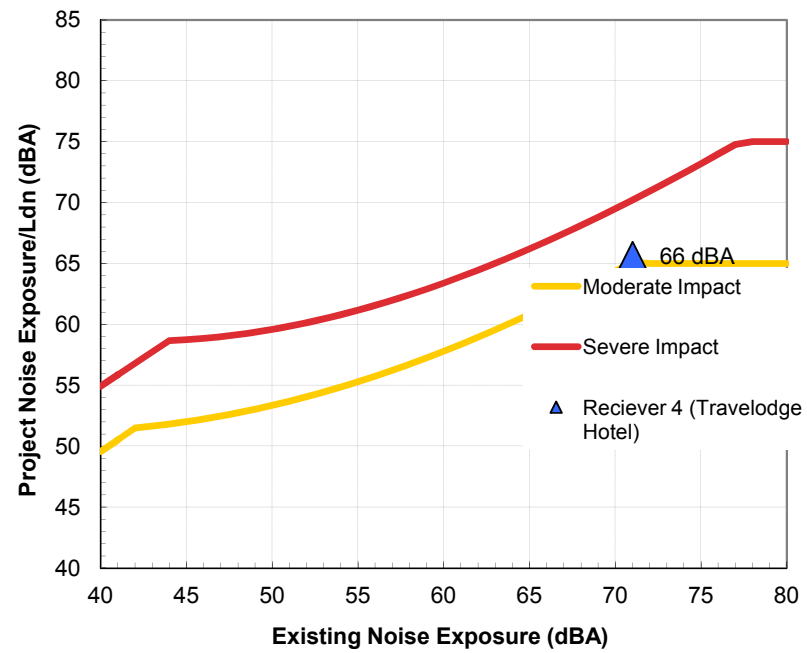
Distance to Impact Contours

Dist to Mod. Impact Contour:	---
Dist to Sev. Impact Contour:	---

Source 1 Results

Leq(day):	56.4 dBA
Leq(night):	50.4 dBA
Ldn:	58.3 dBA

Noise Impact Criteria (FTA Manual, Fig 3-1)



Source 2 Results

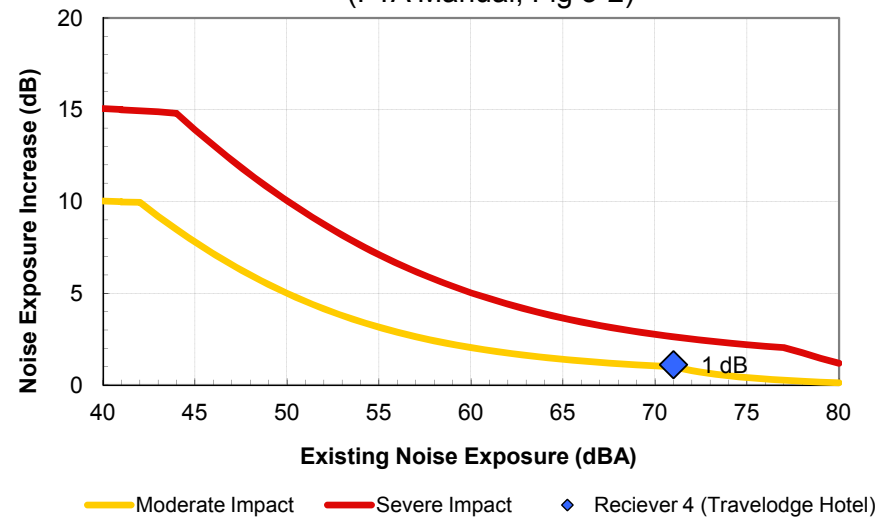
Leq(day): 41.8 dBA

Leq(night): 37.9 dBA

Ldn: 45.1 dBA

Incremental Ldn (Src 1-2): 58.5 dBA

Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Source 3 Results

Leq(day): 51.2 dBA

Leq(night): 48.2 dBA

Ldn: 55.2 dBA

Incremental Ldn (Src 1-3): 60.2 dBA

Source 4 Results

Leq(day): 64.5 dBA

Leq(night): 51.6 dBA

Ldn: 63.6 dBA

Incremental Ldn (Src 1-4): 65.3 dBA

Source 5 Results

Leq(day): 51.8 dBA

Leq(night): 47.9 dBA

Ldn: 55.2 dBA

Incremental Ldn (Src 1-5): 65.7 dBA

Source 6 Results

Leq(day): 38.0 dBA

Leq(night): 32.8 dBA

Ldn: 40.4 dBA

Incremental Ldn (Src 1-6): 65.7 dBA

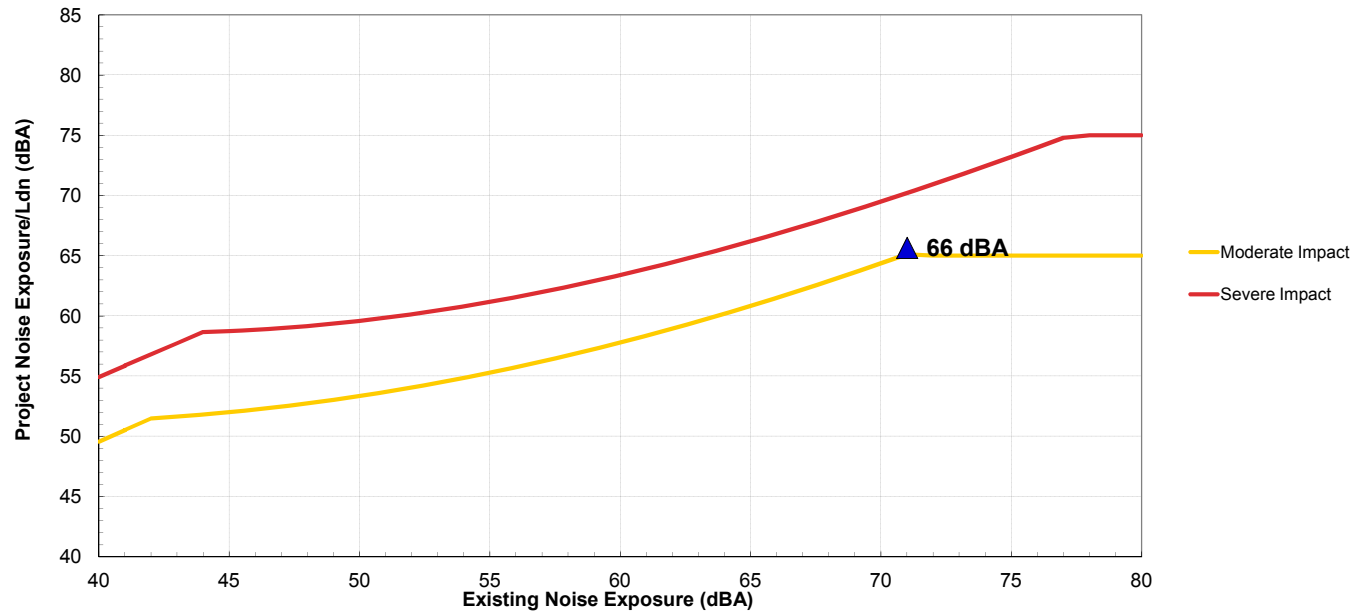
Project: Airport Metro Connector
Receiver: Reciever 4 (Travelodge Hotel)

Source	Distance	Project Ldn	Existing Ldn
1 Rail Transit Vehicle	123 ft	58.3 dBA	71 dBA
2 Parking Garage	260 ft	45.1 dBA	71 dBA
3 Buses (hybrid)	31 ft	55.2 dBA	71 dBA
4 Automobiles and Vans	31 ft	63.6 dBA	71 dBA
5 Automobiles and Vans	170 ft	55.2 dBA	71 dBA
6 Automated Guideway Transi	820 ft	40.4 dBA	71 dBA
Combined Sources		66 dBA	71 dBA

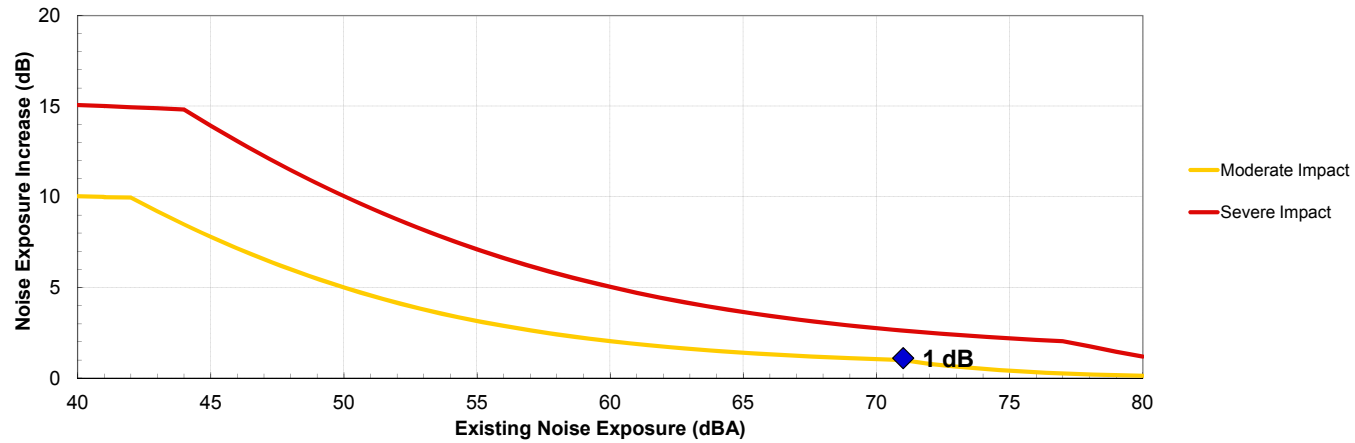
Noise Criteria

Mod. Impact	Sev. Impact	Impact?
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	None
65 dBA	70 dBA	Moderate Impact

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Warning Signal Duration	
Daytime	
Bell Duration (sec)	20
Trains/hr	20
Total Bell Time (sec)	400
Nighttime	
Bell Duration (sec)	20
Trains/hr	6
Total Bell Time (sec)	120

Train Headway

Time (Min)
5

source: Crenshaw Final EIR/EIS Appendix H Technical Analyses Part 1, Warning Signal Noise

Mobile Source Average Distance	
D1	7
D2	56
Average	31.5

Metro Busline 111 Daytime/Nighttime Trips	
Daytime	Trips
One Way Per Hour	4
Two Way Per Hour	8
Nighttime	Trips
One Way Per Hour	2
Two Way Per Hour	4

98th St Cumulative Mobile Trips Calculation

Am West	570
Am East	635
Average AM	602.5
Pm West	637
Pm East	759
Average PM	698
Average	650
Daytime	462
Nighttime	189

Aviation Blvd Cumulative Mobile Trips Calculation

Am North	1396
Am South	1096
Average AM	1246
Pm North	1392
Pm South	1391
Average PM	1391.5
Average	1318.75
Daytime	936.3125
Nighttime	382.4375

Existing Mobile Trips Calculation

Am West	151
Am East	299
Average Am	225
Pm West	308
Pm East	320
Average Pm	314
Average	270
Daytime	191
Nighttime	78

Cumulative vs Existing Mobile Trips

Daytime (Cumulative - existing)	270
Nighttime (Cumulative - existing)	110

Existing Mobile Trips Calculation

Am North	856
Am South	631
Average Am	743.5
Pm North	732
Pm South	858
Average Pm	795
Average	769
Daytime	546
Nighttime	223

Cumulative vs Existing Mobile Trips

Daytime (Cumulative - existing)	390
Nighttime (Cumulative - existing)	159

LAMP + Cumulative Build Noise

Adding Noise Sources

Summation Formula

$$N_s = 10 \times \text{LOG}_{10}((10^{(N_1/10)}) + (10^{(N_2/10)}) + (10^{(N_3/10)}) + (10^{(N_4/10)}))$$

where;

N_s= summation of noise levels

N₁= noise level 1= 66 dBA

Project + APM and Aviation Blvd Increased Mobile Traffic

N₂= noise level 2= 45.1 dBA

ETIF Parking Garage

N₃= noise level 3= 55.2 dBA

98th Street Mobile Traffic Noise

N₄= noise level 4= 0 dBA

N_s= **66.4 dBA**

Source: "*Technical Noise Supplement*". CalTrans, 2009.