

Fairgrounds Speedway Nashville, Tennessee

Environmental Sound Modeling



WRIGHTSON | JOHNSON | HADDON | WILLIAMS

Jack Wrightson:

- **43 years** of experience in the field of acoustics
- Extensive experience in sports and public assembly work
 - 100+ sports & entertainment community noise mitigation studies
 - Local projects include: Nissan Stadium, Bridgestone Arena, First Horizon Park and the Nashville SC Stadium
- Oversees WJHW's work on noise control and the environmental noise impact of outdoor events.
- WJHW has been an industry leader for **30 years**.
- Jack has also served as Adjunct Professor of Acoustics at the University of Texas – Arlington School of Architecture

Executive Summary

Proposed Noise Mitigation Measures



Administrative

- Limit to a total of 10 race weekends per year
- Reduction in practice days
- Curfews on event start and stop times

Noise Control Construction/Restrictions

- Barriers created by:
 - Adding engineered sound absorbing wall
 - New grandstand building, Track buildings
 - Expo building and MLS Stadium
- Mandated muffler use and enforcement for all non-NASCAR racing events

Calculated Sound Level Reductions, Compared to 2019 All American 400

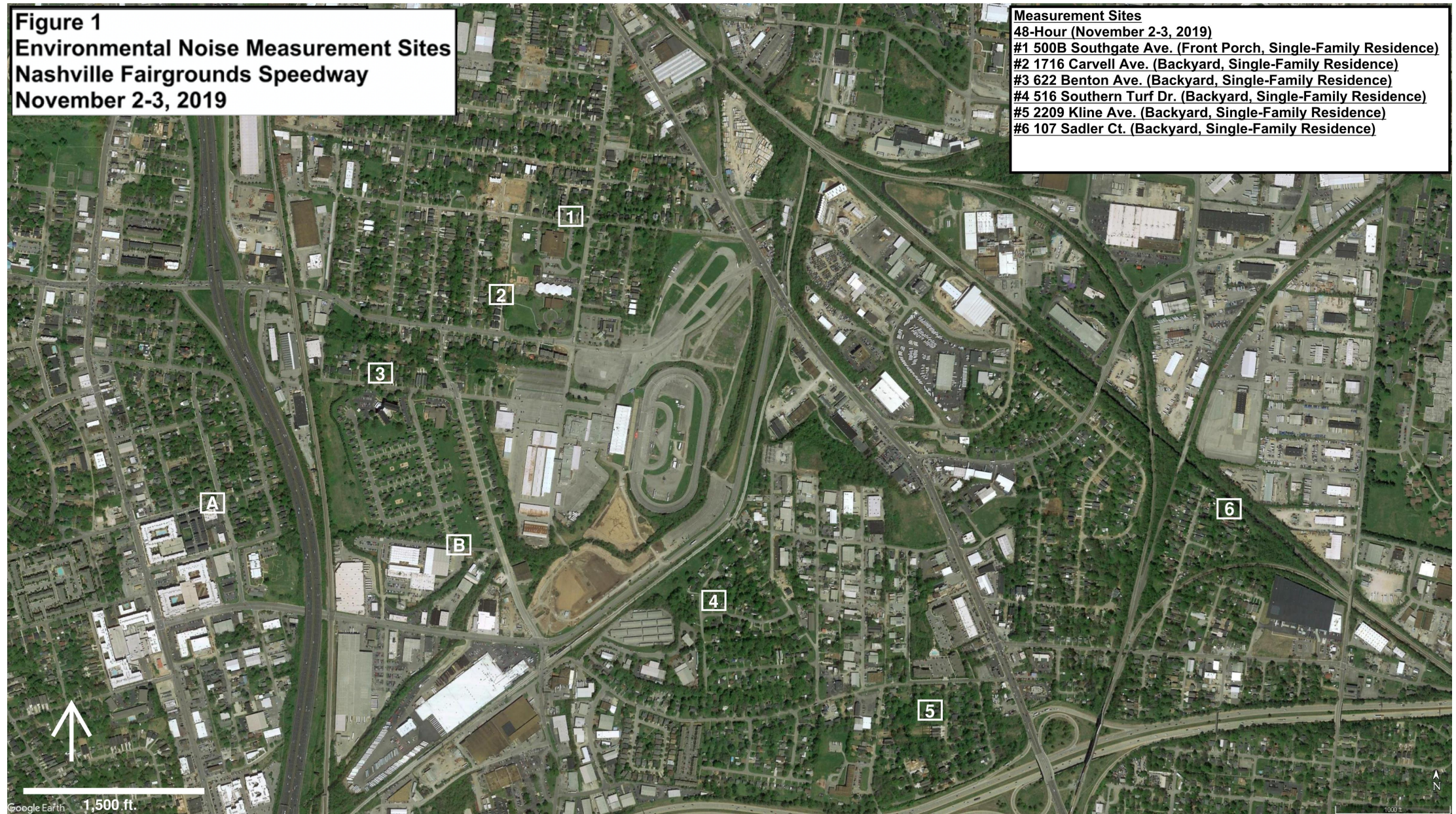
- -7 dBA in all areas for local/regional events – nearing a 50% reduction in perceived loudness.
- No appreciable difference between 2019 All American 400 and predicted NASCAR event.

Calculated Sound Level Reductions at Fall-Hamilton Elementary

- Predicted non-NASCAR event mitigated sound levels to be consistent with current ambient levels.

Figure 1
Environmental Noise Measurement Sites
Nashville Fairgrounds Speedway
November 2-3, 2019

- Measurement Sites**
48-Hour (November 2-3, 2019)
- #1 500B Southgate Ave. (Front Porch, Single-Family Residence)
 - #2 1716 Carvell Ave. (Backyard, Single-Family Residence)
 - #3 622 Benton Ave. (Backyard, Single-Family Residence)
 - #4 516 Southern Turf Dr. (Backyard, Single-Family Residence)
 - #5 2209 Kline Ave. (Backyard, Single-Family Residence)
 - #6 107 Sadler Ct. (Backyard, Single-Family Residence)



	Location	Measured Maximum Sound Level PLM Cars, 2019	Measured Average Sound Level PLM Cars, 2019	20 ft. Sound Wall Predicted NASCAR Lmax, 2021	20 ft. Sound Wall Predicted NASCAR Leq, 2021	20 ft. Sound Wall Predicted PLM with Mufflers Leq, 2021	Afternoon, No Race Ambient Sound Levels Lmax	Afternoon, no race, average sound levels Leq
1	500B Southgate Ave.	90	74	80-85	75-80	55-60	84	55
2	1716 Carvell Ave.	88	75	80-85	70-75	50-55	82	56
3	622 Benton Ave.	78	65	65-70	65-70	45-50	73	52
4	516 Southern Turf Dr.	91	77	90-95	80-85	60-65	68	48
5	2209 Kline Ave.	66	54	75-80	70-75	50-55	75	50
6	107 Sadler Ct.	89	59	70-75	65-70	45-50	77	52
		(note 1)		(note 2)		(note 2)		
Notes: 1 - average sound level measurement over race duration (approx 2 hours), including cautions and restarts								
2 - average sound level measurement over 15 minutes of green flag racing								

CAR SOURCE SOUND LEVEL COMPARISONS

Car Type	Measurement Source	Measurement Type	Measured Levels	Normalized Levels
2019 Pro Late Model, Practice	Measured at Nashville, 2019	Lmax, slow (10 min)	107 dBA at 105'	107 dBA at 100'
Pro Late Model Regulations	From Email with Nashville		97 dBA at 100'	97 dBA at 100'
NASCAR at COTA, Single Car, Straight	Measured at COTA, 2021	Lmax, slow (5 sec)	112 dBA at 95'	112 dBA at 100'
NASCAR at COTA, Single Car, Turn	Measured at COTA, 2021	Lmax, slow (5 sec)	98 dBA at 88'	97 dBA at 100'

Sound pressure levels
(dBA)

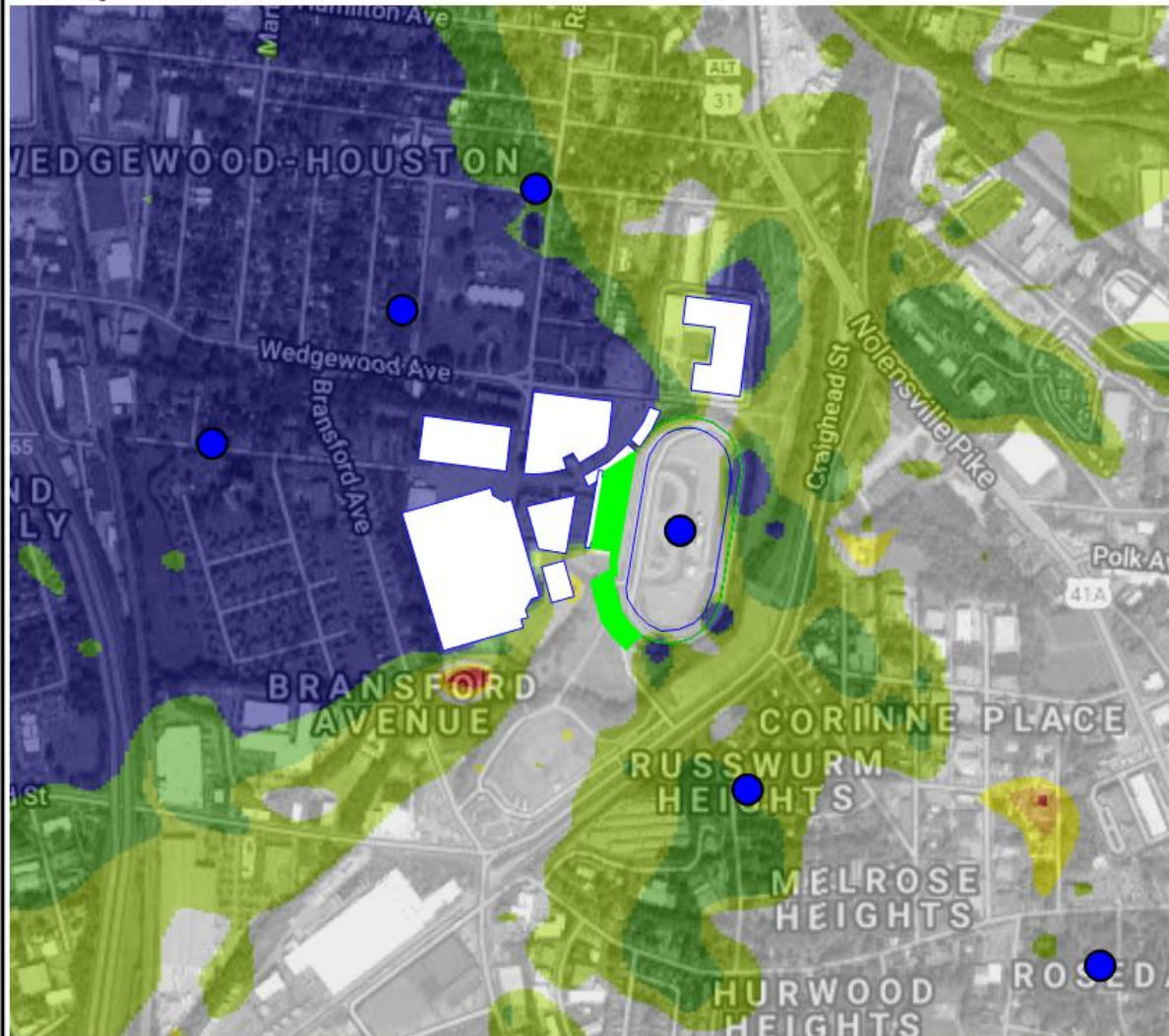
Common indoor and
outdoor noises



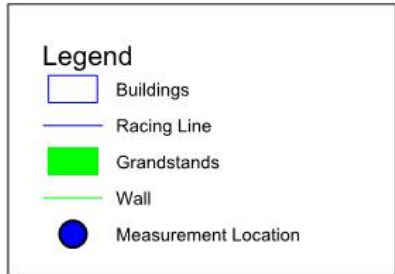
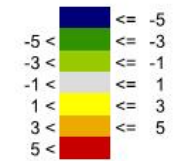
Comparison of Sound Levels Future Construction to Existing Conditions

Fairgrounds Speedway Nashville, Tennessee

Sound Level Difference - PLM (2019) Cars with Future Construction & 20 ft. Sound Wall Compared To PLM (2019) Cars with Existing Grandstand
Average Sound Levels

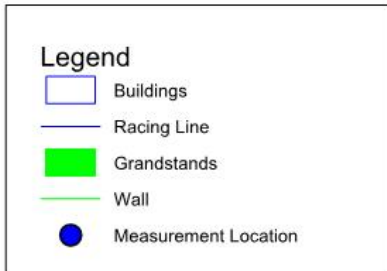


Noise levels dBA

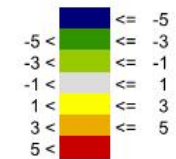


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Sound Level Difference - PLM (2019) Cars with Future Construction & 20 ft. Sound Wall Compared To PLM (2019) Cars with Existing Grandstand
Maximum Sound Levels



Noise levels dBA

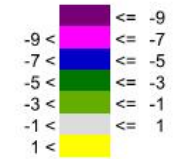


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Sound Level Difference - PLM (with Mufflers) Cars with Future Construction & 20 ft. Sound Wall Compared To PLM (2019) Cars with Existing Grandstand
Average Sound Levels



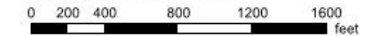
Noise levels dBA



Legend

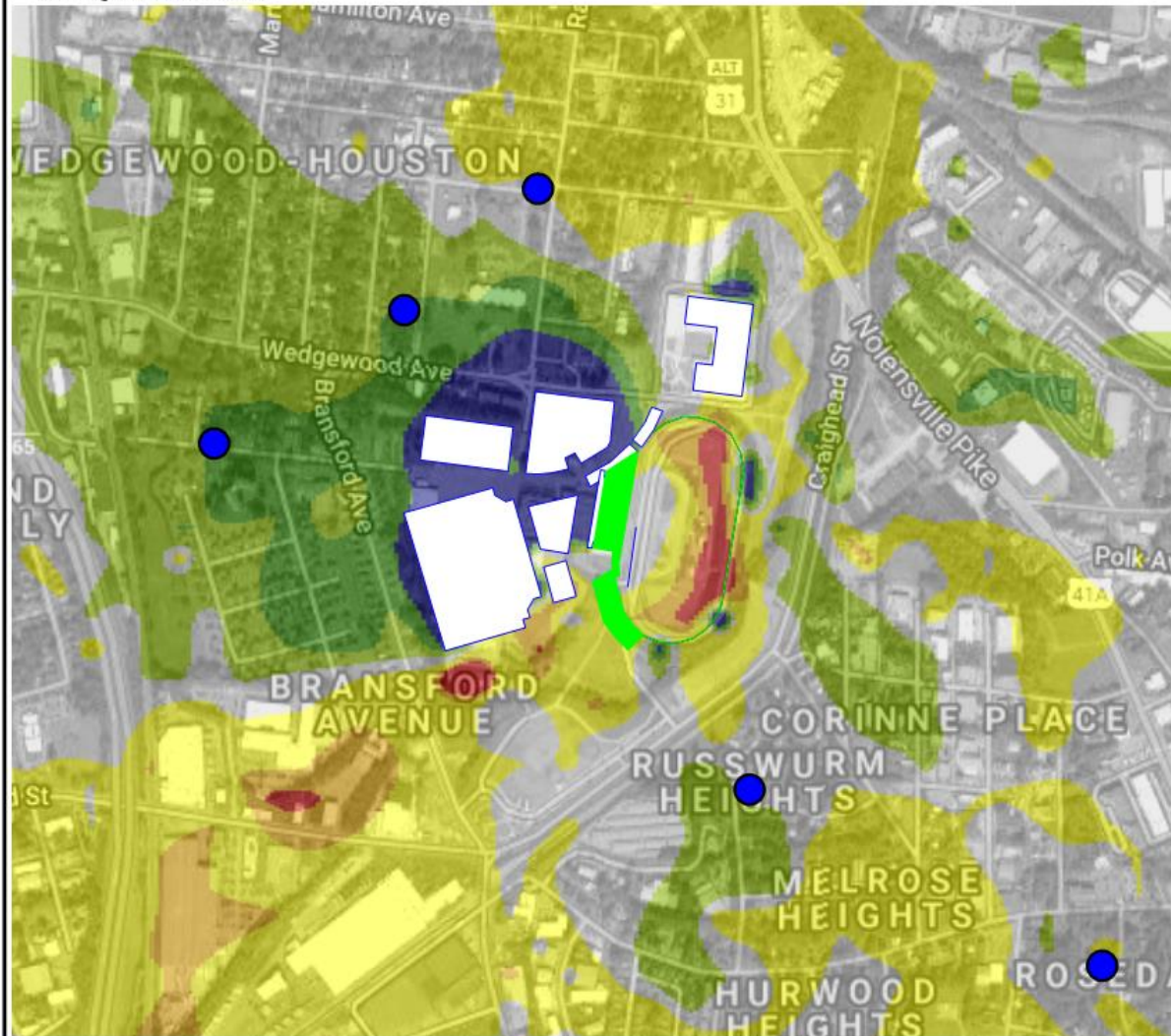
- Buildings
- Racing Line
- Grandstands
- Wall
- Measurement Location

Length Scale 1:918

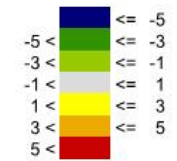


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Sound Level Difference - NASCAR Cars with Future Construction & 20 ft. Sound Wall Compared To PLM (2019) Cars with Existing Grandstand
Average Sound Levels



Noise levels dBA



Legend

- Buildings
- Racing Line
- Grandstands
- Wall
- Measurement Location



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