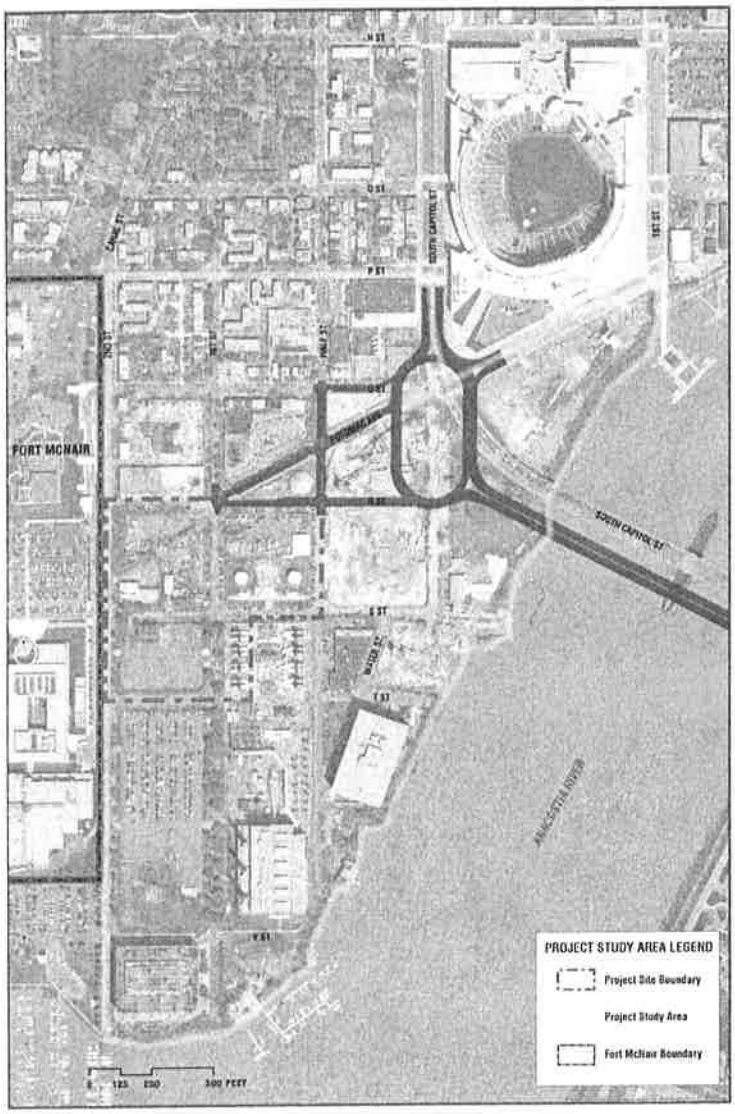
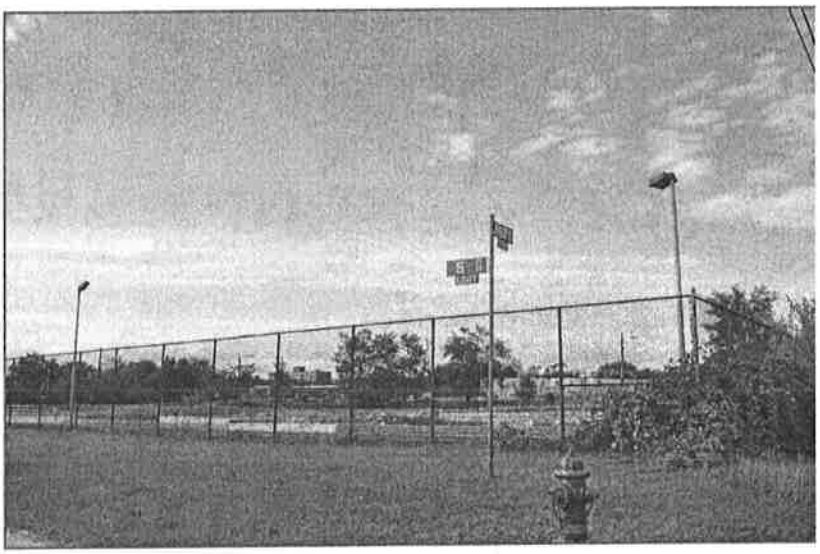
Buzzard Point Soccer Stadium Environmental Mitigation Study

Public Review Document





DGS
THE DEPARTMENT OF GENERAL SERVICES

ONE CITY

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3.6 Environmental Health

3.6.1 Visitor Activity

Current visitation to the project site is characterized predominantly by industrial activity, including the movement of trucks at the salvage facility and the Capital Bikeshare center. There is little pedestrian activity within the project site during the daytime. During Nationals baseball games, the existing parking lot at the site is made available for Nationals Park patrons. Visitor activity includes vehicle movement and parking, and pedestrian movement into and out of the stadium.

The larger study area surrounding the stadium site is dominated by traffic on South Capitol and P Streets, primarily during daytime hours. Surrounding the project site is industrial activity during the daytime, but little activity at night. Additional vehicular circulation is generated by Fort McNair and office buildings during the day. The residential areas to the north of P Street are characterized by residents coming and going, particularly during daytime hours. One nightclub operates in Buzzard Point; activity at this club is primarily during nighttime hours.

3.6.2 Noise

For the purposes of conducting noise analysis for the establishment of a soccer stadium at Buzzard Point, (DDOT)'s policy for conducting traffic-related noise analysis (June 20, 2012) was used as the guideline for assessing potential noise impacts. Potential noise concerns as a result of the project would be associated with 1) temporary stadium construction activities and 2) vehicular traffic to and from the stadium during the game days.

Noise Fundamentals and Analysis Methodology

Noise is generally defined as unwanted sound. Sound is generated by pressure waves in the air. A number of factors affect sound (or noise) as it is perceived by the human ear. These include the actual level of the noise, the frequencies involved, the period of exposure to the noise, and changes or fluctuations in the noise levels during exposure. Levels of noise are measured in units called decibels (dB). The human ear cannot perceive all pitches or frequencies equally well and noise measurements are normally adjusted (weighted) to compensate for the human lack of sensitivity to both low-pitched and high-pitched sounds. The adjusted unit is known as the A-weighted decibel, or dBA. The A-weighted network de-emphasizes both very low- and very high-pitched sounds so measured noise levels correlate with the human perception of loudness.

Human response to changes in noise levels depends on a number of factors, including the quality of the sound, the magnitude of the changes, the time of day at which the changes take place, whether the noise is continuous or intermittent, and the individual's ability to

perceive the changes. Human ability to perceive changes in noise levels varies widely with the individual, as do responses to the perceived changes. Generally, changes in noise levels of less than three dBA are barely be perceptible to most listeners and a ten dBA change is perceived as a doubling (or halving) of noise levels. These thresholds help to predict a person's probable perception of changes in noise levels.

The dBA noise metric describes a noise level at one point in time. However, very few noises are constant and noise levels most often vary and fluctuate. Therefore, measurement methods have been devised to describe variable noise over extended periods of time. One such method consists of describing fluctuating noise over time as if it were a steady, unchanging sound. This method involves the computation of a descriptor called the equivalent sound level (Leq). Leq describes the constant sound level that, in a given situation and time period (e.g., one-minute Leq, one-hour Leq, or 24-hour Leq) would conveys the same sound energy as the actual, time-varying sound. The one-hour Leq, denoted as Leq(h), is an appropriate metric used for mobile source (e.g., traffic) and/or stationary source (e.g., stadium speaker and crowd) noise analyses.

Mobile Sources

The methodology for predicting future on-road traffic noise levels assumes that existing noise levels are dominated by, and are a function of, existing traffic volumes. Changes in future noise levels can therefore be determined by the proportional increase in traffic on the adjacent roadway due to a project. For example, if the existing traffic volume at an intersection were 100 vehicles per hour (vph), and the future traffic volume increased by 50 vph to 150 vph, the noise levels would increase by approximately 1.8 decibels (dBA). For an increase of 100 vph (a doubling of traffic volume) for a total of 200 vehicles per hour, noise levels would increase by 3 dBA.

Stationary Sources

The anticipated new stationary sources under the Proposed Action would be limited to the occasional crowd noise during the game time.

Noise from the proposed new stadium was predicted based on the measurement data and fundamental acoustical principle to assess potential stadium noise impacts on the community. The prediction could be made using the following acoustic formula:

$L_1 = L_{ref} - 20*\log(d_1/d_{ref})$

where:

L_1 is the predicted crowd noise level at a specific distance

L_{ref} is the measured reference hourly equivalent noise level at a reference distance from source

d_1 is the distance from the source to the receiver

d_{ref} is the distance from the source where the reference level is defined

Applicable Noise Regulations

Although the proposed project is not a transportation project directly regulated by the DDOT *Noise Policy* (January, 2011), the *Noise Policy*-outlined procedures for assessing the noise impacts associated with the project can be applied given the potential traffic impacts as a result of the project. Therefore, the *Noise Policy*-established below substantial impact threshold was used as a measure of project noise impact significance.

- A substantial increase in predicted noise levels over existing noise levels occurs. An increase of 10 dBA Leq (h) or greater in noise levels is considered a substantial noise increase.

Existing Noise Conditions

To support the noise analysis, existing noise levels were measured at selected noise-sensitive sites within the project neighborhood. These measured levels provided information on current noise conditions and any shielding effects affecting the propagation of sound from the roadways to nearby noise-sensitive land uses. These measurements were then used as the basis for determining the potential incremental noise in 2017 caused by the cumulative future development activities including the proposed project. These increments predicted were compared to the substantial noise impact threshold to determine noise impact significance.

Noise measurements were taken on August 19, 2014 during a game time period at the locations shown in Figure 3-61. The hourly short-term Leq (h) levels were measured at a total of six (6) noise receptor locations including five (5) sensitive receptors and one receptor immediately adjacent to the proposed stadium site (Figure 3-61) to document typical game time ambient background noise levels in the project area and provide the basis for a comparison with the noise levels when the stadium would operate in 2017. The game time short-term measurements are shown in Table 3-22.

During the measurements, traffic on local streets was observed to be the major contributor to ambient noise at these selected noise sensitive receptors. These measured levels during the game time period are not unexpected. Average neighborhood evening time noise level is around 60 dBA while low 70s occurs along the heavily travelled South Capitol Street.

In the same evening, the Leq (h) noise levels were also measured near the stadium at the Nationals Park when the baseball game was playing and they are summarized in Table 3-23. These measured levels were further conservatively used, representing the proposed stadium reference noise levels, to predict the noise impacts from the proposed stadium crowd noise, even though the proposed stadium is only half the capacity of Nationals Park.

Receptor	Address / Location	Time Period	Monitored Hourly Leq (dBA)
N1	1543 1st St. SW b/n Q St. SW & P St. SW	8-9 pm	60.3
N2	Q St. SW b/n 1st St. SW & Half St. SW	8-9 pm	57.2
N3	103 P St. SW b/n 2nd St. SW & 1st St. SW	7-8 pm	60.4
N4	2nd St. SW b/n S St. SW & R St. SW	7-8 pm	57.4
N5	20 St. SW b/n Carrollsburg Pl. SW & S Capitol St. SW	7-8 pm	71.5
N6	M St. SW & Half St. SW	7-8 pm	59.0

Table 3-22: Measured ambient noise

Receptor	Notes	Monitored Leq (dBA)	Distance from Noise Source (ft)
S1	Dominated by traffic with snippets of stadium noise in between: crowd, announcer, music, clapping chant	71.7	500
S2	Loudspeaker, announcements.	82.2	100
S3	At 1st base gate. Most accurate spectrum with announcer, music, crowd cheers and chants. Announcer dominates.	73.0	500

Table 3-23: Measured stadium noise at Nationals Park

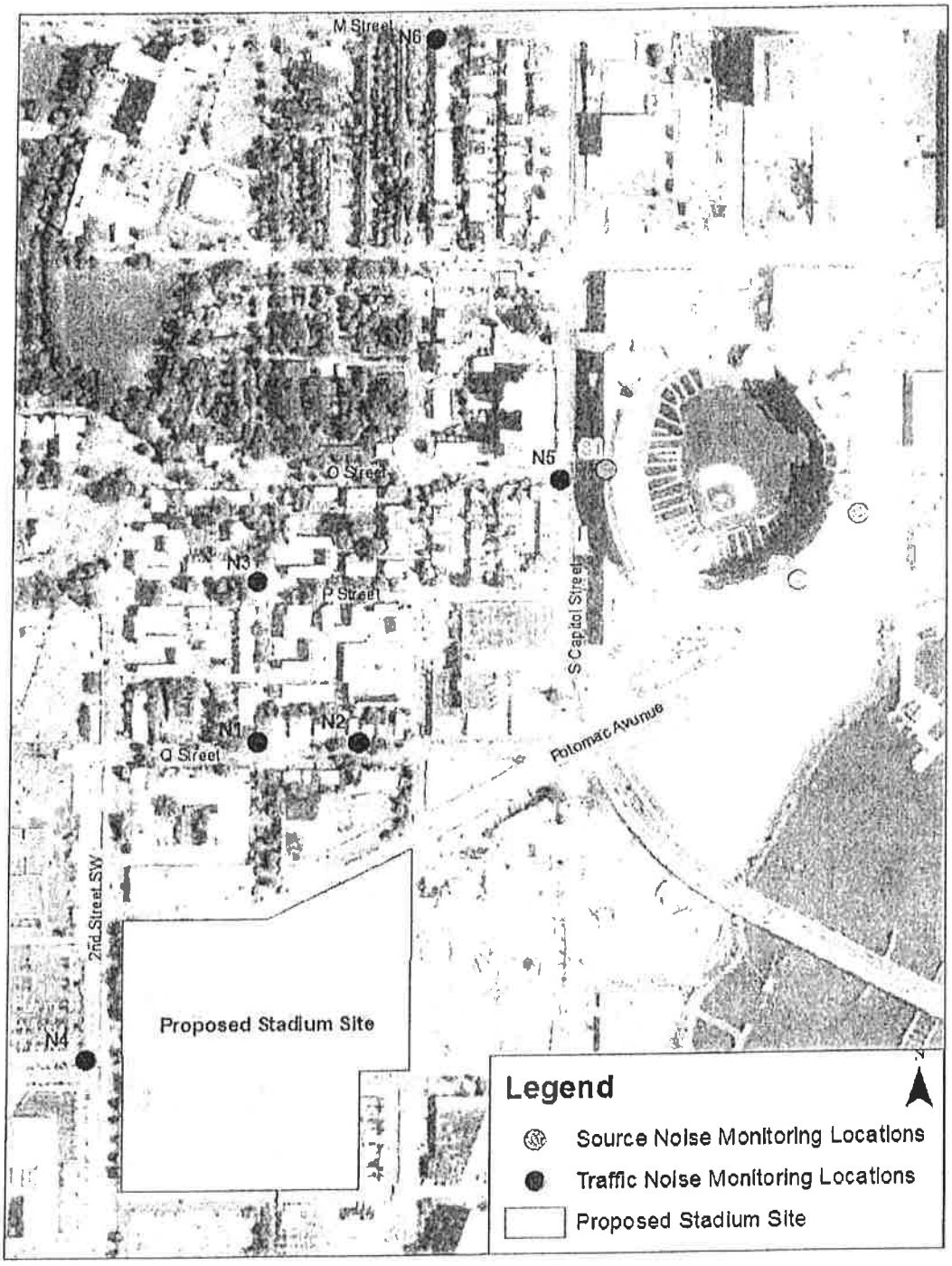

Figure 3-61: Ambient noise measurement sites

amount of pedestrian and vehicular activity in and around the stadium as people move between their cars and the stadium's entrances, and between the Navy Yard/Ballpark Metrorail station entrances and the stadium along Potomac Avenue or along the Riverwalk.

As a result, crowd behavior can vary by game and can be somewhat unpredictable. Attendance is influenced by many factors including the day and time of the game, weather conditions, team performance, and who the opposing team is. Impacts on surrounding areas may result from crowd disruptions and may include elevated vocal behavior and littering. Potential crowd disturbances would likely be somewhat confined to the area south of Potomac Avenue towards the river.

Indirectly, increased activity in the area would be expected on non-game days as a result of the retail and entertainment establishments within and around the ballpark.

Site improvements and an overall increase in pedestrian presence would likely improve perceived security in the area. Improved security at the site may also have indirect benefits on the security of the nearby residential neighborhoods. Impacts on the surrounding areas would primarily be a result of transportation control officers.

Overall, the proposed action would result in minor adverse impacts due to the intermittent increases in pedestrian activity, traffic, and crowd behavior.

Visitor Activity Mitigation

- The District should design and locate appropriate signage to guide pedestrian movement within and around the stadium site, and to move people along major thoroughfares and away from quiet residential streets. Traffic and pedestrian movement would be managed by police officers to ensure circulation and safety.
- The District should patrol residential streets during ballgames to minimize littering and other visitor-generated nuisances.

No Action Alternative

Under the No Action Alternative, no new visitors would be drawn to the site and its environs. Therefore, there would be no impacts.

4.7.2 Noise Impacts

Stadium Alternative

During Construction

Construction activities would generate noise impact from both the operation of construction equipment and the movement of trucks and other vehicles to and from the site. Typical construction equipment reference noise levels are summarized in Table 4-24.

Construction-noise is likely to create annoyance among the projects' neighbors. This adverse impact is unavoidable. However, it should be noted that although the construction campaign can be expected to last for approximately two years, the specific location and character of construction activities would vary considerably over this period, and so would noise levels. No single location or land use would be continuously affected over the entire period.

Overall, the project is not expected to generate substantially greater noise levels than other similar medium or large-scale urban development projects.

Equipment Type	Typical Noise Levels
Earthmoving:	
Loaders	85
Backhoes	80
Dozers	85
Scrapers	89
Graders	85
Truck	88
Pavers	89
Roller	74
Material Handling:	
Concrete Mixers	85
Concrete Pumps	82
Cranes	83
Derricks	88
Stationary:	
Pumps	76
Generators	81
Air Compressors	81
Impact:	
Pile Drivers (impact)	101
Pile Drivers (Sonic)	96
Jack Hammers	88
Pneumatic Tools	85
Other:	
Saws	76
Rock Drill	98

Table 4-24: Typical construction equipment noise levels (dBA at 15 Meters)
Source: Federal Transit Administration, 2006.

During Operation

Mobile Source Impact

As discussed above, if the future traffic cumulative volume would double the existing condition at a given intersection, noise levels would increase by 3 dBA. Based on this fundamental acoustical principle and traffic forecasts around each analyzed intersection

around the project site, the threshold for a substantial noise increase of 10 dBA over the existing condition would not be exceeded at any analyzed intersection (Table 4-25). Therefore the contributions to the future noise levels from the proposed project would not result in substantial noise increases and would result in no significant mobile source noise impacts.

Stadium Crowd Impact

Noise from the proposed new stadium was predicted based on the conservative measurement data at Nationals Park and fundamental acoustical principle discussed above as summarized in Table 4-26. The noise from speaker and crowd during the game time would not result in substantial noise increase (a 10 dBA noise increase over the existing ambient level) at the measured sensitive receptor locations. Therefore the game time stadium crowd noise would unlikely result in significant noise impacts.

Overall, the project would result in short-term minor adverse impacts due to noise generated during construction. Over the long-term, minor adverse impacts would occur due to the increased traffic volume and stadium growth.

Noise Mitigation

The construction contractor would be required to make every reasonable effort to minimize construction noise through abatement measures, which would be incorporated in the construction plans.

Typical abatement measures that could be implemented include:

- Construction activities and schedule would be communicated to the affected community prior to beginning to identify and resolve potential issues.
- Major construction equipment powered by internal combustion engines would be equipped with properly-maintained mufflers.
- New construction equipment would be utilized as much as possible, since it is generally quieter than older equipment.
- Construction activities would only occur during daytime.

No Action Alternative

Under the No Action Alternative, noise levels can be expected to increase as compared to the existing condition as traffic, the main source of noise in the study area, increases as a natural growth.

Intersection	Total Existing Traffic Volume	Total Future Traffic Volume	Doubling of Existing Traffic?	Noise Increment (dBA)	Substantial Noise Increase of 10 dBA
M Street & 4th St SW	3099	4564	No	2	No
M Street & 3rd St SW	2046	3158	No	2	No
M Street & Delaware Ave	2006	3120	No	2	No
M Street & 1st St SW	2196	3299	No	2	No
P St & 1st St SW	838	950	No	1	No
M Street & Half St SW	2296	3355	No	2	No
M Street & S Capitol ramp	2668	4324	No	2	No
M Street & S Capitol ramp	2312	4079	No	2	No
N St & S Capitol ramp	4592	5868	No	1	No
P St & S Capitol St	4917	5959	No	1	No
Potomac Ave SE & S Capitol St	6432	8188	No	1	No
S Capitol St & S Capitol ramp	3999	5401	No	1	No
P St & 3rd Ave SW	1068	1154	No	0	No
L Street SW & 3rd St SW	325	328	No	0	No
O St SW & S Capitol St	4507	5326	No	1	No
1st St SW &	265	297	No	0	No

Table 4-25: Traffic noise increments

Receptor	Proposed DC United Stadium Noise			
	Distance from Proposed Stadium Site Boundary (ft)	Noise Level from Proposed Stadium at Receptor (dBA)	Total Noise Level Combined with Measured Ambient Noise (dBA)	Net Increment Over Existing Level (dBA)
N1	1120	64	66	6
N2	1100	65	65	8
N3	1670	61	64	3
N4[1]	500	71	72	14
N5	2300	58	72	0
N6	3700	54	60	1

Table 4-26: Stadium noise increments at measured noise sensitive receptors

Note: [1] N4 is not a noise sensitive receptor.