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NC-10		11
	A-	140 20
		20 7
-	A-	14 (WHO)
	A-	18

### **Noise pollution in the old of Damascus**

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#### **Abstract**

Outdoor noise levels were measured at 11 sites in the old city of Damascus. Sound level meter Model NC- 10 with a 20-140 dB selectable range was used in the current investigation. At each site noise data was collected during 07:00 to 20:00 O'clock. The results showed that the noise levels were higher than WHO (World Health Organization) stander by 14 dB, in the residential – commercial sites, and commercial sites with heavy traffic, and by 18 dB, in the square of Omayad Mosque in the center of the old city, where there was no traffic. In commercial caravansaries "Khans" the noise levels were acceptable. The study showed that the authorities administration must take necessary procedures the noise levels in the old city of Damascus, throw reducing and organizing the traffic flow in the old city.

Key Words: Noise pollution, old Damascus, outdoor sound levels.

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(AFNOR)

(1991 Botte and chocholle)

.(2001 Shukla and chandel.) Noise pollution

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A-

( )

.(1999 lang)

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Road traffic -1

%40 (1994 Lambert and Valet) .(1 )

%20 ( ) A- 55

%30 A- 65

1998 ) A- 55

(Mage and Walsh

.A- 80-75

%80-60 (1999 Ahmad, 200 Shaik and Shaik, 1995 WHO)

( )

(1995 WHO)

(1)

(%)		
82.3		
79.5	73.4	
4.2	4.6	
2.3	2.4	
9.0		
6.2		
2.5		

-

- 2

-

-3

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(2001 Shukla and Chandel)

1986 1991 Botte and Chocholle 1995,2000 WHO 1996 lercher)

:(1972 Karagodina Nikitin and Novikov

.(Physiological effects )

-1

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-

75 – 70

A-

-

(1999 ISO; Chouard 2001)

) A - 85 80 A - 75

8 (

(1995) WHO

.Presbacousia ( ) Socioacousia

120 (1998 smith)

-2

Autonomic

nervous system

1995 )

(1993 Babisch et.al)

1999 Babisch )

(1980 Cohen et al .Berglund and lindvall.

.(et al.

(1989 Ohostrom)

(1980 Tarnopolsky et al.)

1986 )

.(Nikitin and Novikov

(Standfeild 1992)

(2001 Chouard)

**:Psychological effects**

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(1988 Job 1980 Tarnopolsky)

A- 50

(2001) Klæboe et al.

1972 1986 Nikitin and Novikov 1994 Kryter , 2000 WHO)

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(Karagodina

.%9

(1994) Kryter

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11

(2 )

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( ) -3

.2003 2002

(2)

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	Neutrik	NC-10		
	A	E,C.B,A		
	-	-		
A-	140	20		-
			:	
				-
				-
				-
				-
				-
			60	-
	3600			-
21-20				-
(	)			-
	.12	10	-	-
	.17	16	-	.15 13 -
	.21	19	-	.19 18 -
.(1995 WHO)				
				:
		(LAeq)		3
A-	74.4	71.6	2002	(4 )
A-	67.8			A- 77.8 65.8 -
2002		2003		
A-	78.9	61.9	-	A- 73.7 70.8
			A-	63.1

(2003 – 2002)

(A- )

(3)

2003				2002					
			<b>L<sub>Aeq</sub></b>				<b>L<sub>Aeq</sub></b>		
110.9±3.8	98.9±2.1	59.2±2.6	73.7±2.4	101.8±3.5	95.2±4.4	57.4±1.6	71.6±2.5	-	
111.4±3.1	99±4.1	56.8±1.4	70.8±1.4	112.7±5.2	99.4±5.4	56.5±1.5	73.9±2.2	-	
109.2±2.7	95.2±3.7	55.3±1.3	72.0±1.7	110.0±4.9	96.9±2.5	54.5±1.5	74.7±3.6	-	
110.6±4.1	98.2±5.1	51.1±1.4	71.1±4.3	112.3±4.3	98.8±5.4	53.6±2.9	74.3±2.3	-	
111.9±2.8	99.1±2.1	62±1.6	76.5±2.1	110.9±3.9	98.2±5.0	60±3.1	75.2±2.0		
114.5±3.6	102.6±3.7	61.9±1.4	77.4±3.0	113.7±3.5	101.2±3.4	61.7±2.1	77.8±1.0		
112.3±3.4	100.8±3.6	56.4±3.4	78.7±3.9	115.9±6.9	110.3±3.8	53.5±1.9	76.4±3.8		
99±8.8	82.3±5.8	55.4±4.5	61.9±3.6	100.0±3.1	85.7±1.9	56.5±3.6	65.8±2.9		
111.3±7.7	94.3±2.9	53.0±0.8	68.8±1.8	110.5±7.0	99.1±8.2	51.6±3.7	71.5±6.1		
105.2±6.2	52.5±5.5	51.4±2.0	66.4±3.0	110.4±11.9	95.7±8.8	50.9±1	69.4±5.3		
101.3±4.2	87.1±7.8	51.9±3.20	63.1±3.2	108.0±6.4	94.4±9.0	50.8±4.2	67.8±5.6		



(A- ) (4)

						(4)
35	45	35	45	35	45	
40	50	40	50	40	50	
45	55	45	55	45	55	
50	60	50	60	50	60	
50	65	55	65	55	65	
60	70	60	70	-	-	
-	-	-	-	40	50	

)

A- 10 (

-2002 -

A- 10

2003 A- 17

(A- 12 ) A- 10

(A- 10 )

( ) (4 )

0 - A- 14 11

2002 A- 18 A- 14

( ) 2003 A- 13

A- 20 ( )

10 (A- -100 80 )

2002

7.8 4.4 1.1 - 5.3 3.8

2003

4.8-0 - 4.8-3.5

(.5 ) 4.5

(µpa) A- (5)  
2002-1

( )	A-	µp	A-	µpa	A-	
5.3-3.8	14.4-11.6	20.000	60	104760-76040	74.4-716	-
4.4-1.1	12.8-0.8	35.570	65	155.250-39.000	77.8-65.8	
7.8	17.8	6320	50	49.090	67.8	
<b>2003-2</b>						
4.8-3.5	13.7-10.8	20.000	60	96.830-69.350	73.7-70.8	-
4.8-0	13.7	35.570	65	172.200-24.890	78.7-61.9	
4.5	13.1	6.320	50	28.580	63.1	

57.4 53.6 2002 (3)  
A- 51 A- 61.7 51 A-  
3  
(A- 59.2) LAeq  
(A- 62.0 )  
50.0 ) (A- 52-51)  
(A-  
(LAeq)  
A- 5-4  
.A- 10  
:

A- 101.2 94.4 (3)  
2003 A- 102.6 87.1 2002  
2003 2002 A- 82.3 85.7  
99 2002 A- 116 100

.2003 A- 114.5

**:Percentile**

3600 NC-10  
- -  
%1 2002 (6)  
%50 A- 81.3 - -  
A- 59.8 %99 A- 65.7  
( 2002 ) %95 (6)  
(A- - 60)  
65) ( %90 ) %90  
(A- 50) %99

**(2002) Percentile 6**

%99	%95	%90	%50	%10	%5	%1		
59.8	61.2	62.0	65.7	72.6	75.2	81.3		
59.5	61.7	62.9	67.8	75.1	77.6	84.0		
58.3	60.4	61.8	67.6	77.1	79.8	85.0		
56.5	58.9	60.4	67.2	75.8	78.4	84.8		
62.6	64.2	65.2	69.3	77.1	80.1	86.1		
64.3	65.8	66.7	71.0	79.0	82.3	89.5		
56.9	59.6	61.2	67.5	76.7	81.0	88.4		
57.7	58.5	59.0	61.9	68.3	71.1	75.7		
54.6	56.3	57.4	63.0	70.5	73.3	79.4		
53.1	54.5	55.4	59.8	68.2	72.4	80.1		
52.7	54.0	54.8	58.6	66.3	70.0	77.9		

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( %10 ) %10

\_\_\_\_\_

(7 )

1

( A- 65)

%10

(8 )

%5 (A- 69.1)

(A- )

(7)

			<b>LAeq</b>		
99.5	85.1	50.1	65.9		
75.3	62.4	37.4	47.8		
91.6	80.5	53.9	61.9		
105.1	92.3	53.6	61.2		

**Percentile**

**8**

<b>%99</b>	<b>%95</b>	<b>%90</b>	<b>%50</b>	<b>%10</b>	<b>%5</b>	<b>%1</b>		
52.4	54.8	55.9	60.8	69.1	71.8	76.9		
39.3	40.6	41.6	45.8	51.0	52.5	55.6		
54.9	55.7	56.2	59.1	64.7	66.7	70.7		
54.2	55.1	55.5	57.6	61.0	62.2	66.3		

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:

(LAeq)

A- 14

A- 18-13

5

8

-

%95

%90

%99

( )

-

A- 95 ( )

A- 116 100

A- 101 ( )

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( ) 16

( )

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A- 77

( )

- 11

A- 65.8

A

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A- 19 11

:		( )		-1
				-2
( )				-3
				-4
				:
				:
		LAeq		-
A-	18	-	A-	14
		)		%95 Percentile
		(		%90
				%99
				-
A-	11			-
19-11				
				A-
				:
				-
				:
				-

( )

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